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NATURAL RESOURCES CONSERVATION BOARD

Application No. 1701

SPRINGBANK OFF-STREAM RESERVOIR PROJECT

P R O C E E D I N G S

Volume 8

March 31, 2021

(Via videoconferencing)

1 Natural Resources Conservation Board Proceedings taken
2 virtually in Calgary and Edmonton, Alberta.

3

4 Volume 8

5 March 31, 2021

6

7

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Gavin Fitch, Q.C.	
Michael Barbero	

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Sara Munkittrick	
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Luigi Cusano, Q.C.	For Calgary River Communities Action Group and Flood Free Calgary
Gino Bruni	

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1 Richard Secord For SR1 Concerned Landowners
Ifeoma Okoye Group

2

3 Bob Williams For Calalta Amusements Ltd.
and Calalta Waterworks Ltd.

4

5 Scott Wagner For Scott Wagner

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7 Lorelee Vespa CSR(A) CRR RPR Official Court Reporters
Deanna DiPaolo, CSR(A)

8

(PROCEEDINGS COMMENCED AT 8:29 A.M.)

9

10 THE CHAIR: All right. Well, good morning,
11 everyone. Welcome to Day 8 of the SR1 1701 application
12 hearing.

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THE CHAIR: Thank you. So, Ms. Friend, what

1 number would that be?

2 MS. FRIEND: The next number would be 386.

3 THE CHAIR: And no objections to those
4 filings?

5 MR. SECORD: One correction, Mr. Kruhlak. I
6 think Dr. Fennell was hoping to get the response to the
7 snow data undertaking, and I'm wondering -- we didn't
8 think it would take long to get that put together. I'm
9 just wondering if -- because I think Dr. Fennell might
10 want to look at that, so...

11 THE CHAIR: Mr. Secord, sorry to interrupt.
12 The court reporter's just asking if you could raise
13 your voice a bit. Thank you.

14 MR. SECORD: Sure, sure. So I'm just wondering
15 if that is close to being provided.

16 MR. KRUHLAK: Mr. Secord, it's Ron Kruhlak. Let
17 me just take that away, and I'll try to give you an
18 update on that as quickly as I can.

19 MR. SECORD: Thank you.

20 THE CHAIR: So that'll be exhibit -- sorry,
21 Ms. Friend?

22 MS. FRIEND: 386.

23 THE CHAIR: 386, okay. Thank you.

24 Thank you, Mr. Kruhlak.

25

SCLG TOPIC #4 PANEL

1 **EXHIBIT 386 - AT UNDERTAKING RESPONSES**
2 **TO 10, 12, 13, 15, 19, 21, 22, 23**

3 THE CHAIR: Any other matters for this
4 morning? Hearing none, we'll start with
5 cross-examination of SCLG panel.

6 While unlikely, I'll ask if Mr. Rae of
7 Stoney Nakoda, did you have any cross?

8 MS. LOUDEN: Good morning, Mr. Chairman. This
9 is Sara Louden. We do not have any cross.

10 THE CHAIR: Thank you, Ms. Louden.

11 And Mr. Williams? He may or may not be online.

12 Mr. Williams? Okay, hearing none.

13 And Mr. Wagner? Again, hearing none.

14 Ms. Senek, City of Calgary?

15 MR. MERCER: Good morning, Mr. Chair. It's
16 David Mercer here from the City of Calgary.
17 Ms. Senek's away today, and I'm stepping in.

18 The City of Calgary may have a few questions, if
19 the Board so indulges. It would only be for probably
20 five to ten minutes, and it wouldn't be for the entire
21 panel. It would be entirely directed at Dr. Fennell,
22 if that's acceptable to the Board.

23 THE CHAIR: It is. Please proceed.

24 MR. MORRIS: Thank you.

25

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Mercer

1 A. LOCKE, J. FENNELL, D. KLEPACKI (For SCLG), previously
2 affirmed

3 MR. MERCER CROSS-EXAMINES THE PANEL:

4 Q. Good morning, Dr. Fennell.

5 A. MR. FENNELL: Good morning, Mr. Mercer. How are
6 you?

7 Q. Good. Thank you. The City of Calgary has a few
8 questions. We expect a lot of the technical matters
9 will be addressed by AT.

10 Our questions, in particular, relate to your
11 presentation yesterday in relation to the beyond the 1
12 in 20-year protection offered by SR1. And, in
13 particular, within your PowerPoint presentation
14 yesterday at Exhibit 384, page 23, you stated that:
15 (as read)

16 "The SR1 design does not address floods
17 greater than the 2013 event, which was a
18 1 in -- approximately 1 in 200, which
19 can be expected."

20 However, the City of Calgary's witness, Mr. Frigo, in
21 his presentation, on behalf of the City of Calgary, he
22 presented data that clearly shows the flood protection
23 well beyond the 1 in 200 threshold, up to and including
24 things like 1 in 500.

25 At this point, I would ask the document controller

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Mercer

1 to please bring up Exhibit 351, Slide 11.

2 And this chart I'm about to show is also repeated
3 in the City's main written submissions.

4 Are you familiar -- I'm not sure -- I don't see the
5 table brought up yet. I was going to ask, are you
6 familiar with this table?

7 **A. MR. FENNEL:** I'd have to see it just to --

8 THE COURT REPORTER: I'm sorry, Dr. Fennell --

9 THE CHAIR: Just one minute.

10 (DISCUSSION OFF THE RECORD)

11 MS. FRIEND: Mr. Williams. Mr. Williams, your
12 mic is on so we can hear this conversation. Please
13 mute yourself.

14 THE CHAIR: Thank you. Is everyone muted?

15 MS. FRIEND: Thank you.

16 THE CHAIR: Thanks.

17 Q. MR. MERCER: Thank you. It's the table on the
18 bottom of the page here.

19 **A. MR. FENNEL:** Yeah, I recall that.

20 Q. So within this table, which was prepared by
21 Golder & Associates in 2020, they go through kind of
22 the potential probability of a flood event, and they go
23 well beyond the 1 in 200. And they show, if you look
24 on the far right-hand columns, the net peak flow
25 reduction. And even if you go as far as, say, 1 in

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Mercer

1 500, there's a 73 percent net flow reduction, and
2 equivalent probability of Glenmore of 1 in 29 years.

3 Would you not say that's a great benefit beyond
4 the 1 in 200-year flooding event associated with the
5 SR1 off-stream dry dam?

6 A. MR. FENNELL: Yeah. I think what you need to
7 keep in mind is, you know, the context around that
8 statement.

9 There is flood protection obviously for the City
10 of Calgary beyond the 1 in 200. But the areas upstream
11 of the Glenmore Reservoir aren't protected above that
12 because that additional flow's going to be passed
13 downstream, it will go into the Glenmore Reservoir,
14 which will have some additional capacity to absorb
15 that. But there are areas upstream in Elbow --
16 Elbow Valley or Discovery where, you know, those --
17 those particular parts of the Elbow River residents
18 will not be protected. So that was the context of that
19 particular statement.

20 So I would agree that -- I would agree that this
21 does provide, you know, maybe beyond a 1 in 200 for the
22 City of Calgary, but certainly not the entire reach of
23 the river upstream.

24 Q. Okay. So your comments yesterday were limited to those
25 areas upstream of the Glenmore Reservoir, basically in

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Mercer

1 between SR1 and Glenmore Reservoir?

2 A. MR. FENNELL: Yeah, of course. And, really, you
3 know, the whole purpose of this exercise is to protect
4 people and property, and there are people and property
5 that aren't protected by SR1.

6 You know, they -- you know, the 1 in 200 is -- or
7 the 2013 design flood is what -- what this structure is
8 being constructed to, or will be constructed to, but
9 what we're saying is that, you know, the probability of
10 some higher frequency or higher magnitude in floods in
11 the future does exist.

12 And if you recall in my slides that I presented
13 yesterday, I showed a flood return period where we were
14 showing a shift in the frequency of the floods, you
15 know, to -- to more frequent return periods.

16 What I actually didn't describe in that, which I
17 would have liked to have described -- I just forgot --
18 was that if you do take a flood of 1 in 100 or 1 in
19 200, you're going to see the magnitudes of those
20 increase.

21 So what we're talking about is trying to design to
22 a proper level of protection for these downstream
23 communities.

24 Q. Just one follow-up question in relation to this chart.

25 If you see I would call them Columns 3 and 4,

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Mercer

1 which relate to flow peak into SR1 and flow peak into
2 Glenmore, if I understand correctly, you mention that
3 you felt your statements relating to those communities
4 and individuals in between SR1 and Glenmore, but does
5 not this chart show that there would be a great
6 reduction in flows for the 1 in 200 and 1 in -- sorry,
7 in particular, for the 1 in 200 relating to those exact
8 communities. So if we had a flood as we had in 2013,
9 those communities would have some benefit?

10 **A. MR. FENNELL:** Of course, they'll have some
11 benefit, but they're still not going to be completely
12 protected. And if the goal of flood protection for --
13 for the Calgary region is to protect everybody, then
14 the argument could be made that it isn't protecting
15 everybody. It's certainly protecting the people
16 downstream of the Glenmore Dam which is -- which is
17 fine, but if we are -- if the goal of this exercise is
18 to protect people and property, then I don't know why
19 we wouldn't want to try to do that for everybody.

20 **Q.** Thank you for that. I believe that's all the questions
21 for the City of Calgary for now.

22 I know -- I'm expecting AT will have a lot more in
23 the technical-type nature questions, so thank you.

24 **A. MR. FENNELL:** Thank you.

25 **THE CHAIR:** Thank you, Mr. Mercer and

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Mercer

1 Mr. Fennell.

2 Calgary River Communities Action Group.

3 Mr. Cusano or Mr. Bruni, do you have any questions for
4 the panel?

5 MR. CUSANO: Good morning, sir. It's
6 Lou Cusano. No, thank you.

7 THE CHAIR: Okay. Thank you, Mr. Cusano.

8 And so, Mr. Kruhlak, you mentioned that your
9 colleagues were likely going to be -- okay. Mr. Fitch,
10 it looks like you're up, do I have that correct?

11 MR. FITCH: Yes, Mr. Chairman. It's
12 Gavin Fitch speaking.

13 So I will be beginning this morning by asking some
14 questions of Mr. Locke, following which my colleague,
15 Mr. Barbero, will have some questions for Dr. Fennell
16 and Dr. Klepacki.

17 THE CHAIR: And by my account, there was a
18 clear request Alberta Transportation had some time for
19 Topic 4, so you've got, you know, allocated about four
20 hours, so that would take us probably to the noon hour.

21 So, just in terms of timing, not sure if you need
22 that time or not, but that's been allocated, and the
23 time is yours, so please proceed.

24 MR. FITCH: Thank you, Mr. Chair. And I can
25 tell you I'm quite sure we won't need nearly all of

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Fitch

1 that time. I'm not sure how long Mr. Barbero will be,
2 but I don't expect to be particularly long with
3 Mr. Locke.

4 **MR. FITCH CROSS-EXAMINES THE PANEL:**

5 Q. So anyhow, to begin, Mr. Locke, are you with us?

6 A. **MR. LOCKE:** **I'm here.**

7 Q. Good morning. How are you?

8 A. **MR. LOCKE:** **Yeah, I can.**

9 Q. Good, thanks.

10 Mr. Locke, you acknowledge in your report and
11 again in your testimony that Alberta Transportation has
12 addressed much of the inherent uncertainties
13 surrounding fish and fish habitat in the Elbow River
14 and the potential project effects on fish and fish
15 habitat. Do I have that right?

16 A. **MR. LOCKE:** **That's correct, yes.**

17 Q. Okay, good. And you also acknowledged in your
18 testimony yesterday that Stantec's responses to your
19 report that were filed as part of Alberta
20 Transportation's reply submission were I think you said
21 well taken; correct?

22 A. **MR. LOCKE:** **That is correct, yes.**

23 Q. Yeah. So all of that being the case, I just want to
24 begin by trying to identify what are the remaining
25 concerns that you have with respect to SR1.

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Fitch

1 And so sir, as far as we are able to tell, the
2 only real substantive area is the release of water from
3 the reservoir back into the river. Is that fair to
4 say?

5 **A. MR. LOCKE:** That's my concern. My -- my
6 number one concern is demonstrating that everything
7 that can be done to keep the fish from being entrained
8 would be my number one concern, to make sure that every
9 possible option that might be feasible has been looked
10 at to keep the fish from being entrained, yes -- and
11 then the second one would be the release of the water
12 back into the Elbow River, yes.

13 **Q.** Okay. Thank you. So with regard to the release of
14 water back into the river, you state in your report,
15 and you don't have to bring it up, but you state that:
16 (as read)

17 "This is an area where the potential
18 effects to fish habitat resulting from
19 changes to the frequency, duration or
20 magnitude of flows can be mitigated."

21 Correct?

22 **A. MR. LOCKE:** Correct.

23 **Q.** Right. And I think your point there is that there's
24 not much you can do to change the flows into the
25 reservoir, but you can manipulate -- depending on how

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Fitch

1 you operate the reservoir, you can manipulate how the
2 water is released back into the river; correct?

3 **A. MR. LOCKE:** **Correct.**

4 **Q.** And I think it's a matter of record at this point that
5 Alberta Transportation has assessed a, what we've
6 called, a "late release" and an "early release"
7 scenario; correct?

8 **A. MR. LOCKE:** **Correct, yeah.**

9 **Q.** Okay. And you note in your report that: (as read)

10 "The late and early release scenarios
11 have shown that there are differences
12 with respect to impact to fish and fish
13 habitat which will ultimately lead to
14 trade-offs."

15 Correct?

16 **A. MR. LOCKE:** **Correct, yeah.**

17 **Q.** And that leads you to recommend that: (as read)

18 "The range of possible release scenarios
19 to be evaluated should be expanded
20 beyond a late and early scenario based
21 on concepts of Environmental Flow
22 science."

23 Correct?

24 **A. MR. LOCKE:** **Right, yes, yes.**

25 **Q.** And you refer to a criterion that you characterize a

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Fitch

1 the best-case scenario, and that criterion is:

2 (as read)

3 "...a release that results in no more
4 than a 10 percent increase of the
5 instantaneous flow in the Elbow River."

6 **A. MR. LOCKE: Correct, yeah.**

7 **Q.** Okay. And it's best case because, as you say in your
8 report, it: (as read)

9 "...is considered to have a low
10 probability of detectable impacts to
11 aquatic ecosystems"?

12 **A. MR. LOCKE: Yes, correct.**

13 **Q.** And the ecosystem we're talking about here, of course,
14 is the Elbow River; right?

15 **A. MR. LOCKE: Correct, yes.**

16 **Q.** And so if I were just to call that criterion the
17 "10 percent increase criterion," you'd know what I'm
18 talking about?

19 **A. MR. LOCKE: Yes.**

20 **Q.** Okay. Sir, would you agree with me that the 10 percent
21 criterion is effectively a late release scenario?

22 **A. MR. LOCKE: Yes, it was -- it was close to
23 that, yes.**

24 **Q.** Okay. Sir, would you -- would you be surprised to
25 learn that Stantec did a high-level look at the

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Fitch

1 10 percent criterion and found that meeting it would
2 result in water remaining in the reservoir until
3 December, assuming a flood in, you know, say, June.
4 Would that surprise you?

5 **A. MR. LOCKE: No, that would not.**

6 **Q.** Okay. And I take it you understand that the -- that
7 originally when the EIA was filed by Alberta
8 Transportation, it was based on what we're now calling
9 the "late" release scenario?

10 **A. MR. LOCKE: Yes, I believe so.**

11 **Q.** Right. And you understand also I'm sure that the
12 "early" release scenario was something that was
13 specifically asked for by the federal government and
14 specifically the Impact Assessment Agency of Canada and
15 the Department of Fisheries and Oceans?

16 **A. MR. LOCKE: I think I may have missed that.**

17 **Q.** Oh, okay. Document manager, if you could just pull up
18 Exhibit 218, please.

19 So Dr. -- sorry -- Mr. Locke, this is -- this is a
20 response by Alberta Transportation to information
21 requests made by the federal government, and if we
22 could turn to PDF page 19, please.

23 So we're looking, Mr. Locke, at Information
24 Request 4-01, which you can see is titled "Project
25 Operation - Release Scenarios." Right?

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Fitch

1 A. MR. LOCKE: Yeah.

2 Q. So, just to be clear, you didn't -- when you prepared
3 your report, you didn't review this particular IR
4 response?

5 A. MR. LOCKE: I'm going to -- can I...

6 Q. Take a moment and have a look at it if you'd like.

7 A. MR. LOCKE: Well, I've kept track of what I've
8 reviewed. I know I was in excess of 3,000 pages, at
9 some point, of documents, but I can...

10 So I'm just -- I have a very long document here of
11 documents that I reviewed, so I'm not finding it.

12 So let's just go with the one that's up here.

13 Q. Okay. All right.

14 A. MR. LOCKE: Sorry.

15 Q. No, that's fine, and I appreciate there's a lot of
16 documents. It's not hugely shocking that you may have
17 missed one.

18 Okay. So what I just want to draw your attention
19 to, Zoom host, if we can just scroll down a little bit,
20 please.

21 You'll see there the context and rationale for the
22 information request from the Impact Assessment Agency
23 of Canada, and I'm just going to read part of that to
24 you. It states: (as read)

25 "The EIS presented a release scenario

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Fitch

1 where floodwaters would be held in the
2 reservoir until flows in the Elbow River
3 return to below bank-full levels,
4 (20 cubic metres per second) and then
5 released. Federal authorities and
6 Indigenous groups have raised many
7 concerns regarding holding the water in
8 the reservoir for an extended period of
9 time, including potential effects from
10 releasing dirty floodwaters back into
11 the clear/low-flow river water, the
12 effects to the fish entrained in the
13 reservoir, and the effects of the
14 settling of sediment on vegetation in
15 the reservoir. Fisheries and Oceans
16 Canada noted that the objective should
17 be to return turbid water back to the
18 system as quickly as possible while a
19 turbid high flow scenario still exists
20 in the river."

21 So you'd agree with me that DFO looked at the late
22 release scenario, expressed concerns, and asked, in
23 effect, Alberta Transportation to develop what we're now
24 calling the "early" release scenario. Is that -- does
25 that -- would you agree with that now?

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Fitch

1 **A. MR. LOCKE:** **Yes. And I think I -- I -- I am**
2 **recalling that there was obviously the request to do**
3 **something other than I guess what's called the "late"**
4 **release. Yes, I am -- I am aware of it, yes, yeah.**

5 **Q.** And, of course, the reason why DFO asked for the early
6 release scenario is, as just indicated in the passage I
7 read into the record, they -- their view was that doing
8 so would avoid all of the adverse effects associated
9 with keeping water in the reservoir for a long time;
10 right?

11 **A. MR. LOCKE:** **Right.**

12 **Q.** And you'd agree with me that, at the end of the day,
13 for this project to proceed, Alberta Transportation is
14 going to have to get permits and approvals from the
15 Department of Fisheries and Oceans?

16 **A. MR. LOCKE:** **Yes, I am aware.**

17 **Q.** Yeah, so they're going to have to ultimately bless this
18 whole business and, I guess, make a determination on
19 which release scenario is the best; is that fair?

20 **A. MR. LOCKE:** **Yes.**

21 **Q.** Okay, thank you.

22 **A. MR. LOCKE:** **Yeah.**

23 **Q.** Okay, then just to return to my first set of questions.

24 So you mentioned that the only things, really,
25 that -- the only concerns that really you have left at

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Fitch

1 this point are the release of water back into the
2 river, which I think we've now dealt with; and then the
3 second thing -- or, actually, it was the first thing
4 you mentioned was that, everything that can be done to
5 prevent entrainment into the reservoir should be done;
6 right?

7 **A. MR. LOCKE:** **Yes, yes.**

8 Q. Okay, and you'd agree with me that, in your report, you
9 made a suggestion of, I think it was some sort of a
10 sonic device to try to essentially warn fish off
11 entering the diversion channel?

12 **A. MR. LOCKE:** **Yes, yeah.**

13 Q. Okay. And you'd agree with me that in its response to
14 your report, Stantec -- well, Alberta Transportation
15 agreed that that would be something they'd be prepared
16 to look at?

17 **A. MR. LOCKE:** **Yes.**

18 Q. And then I heard you say in your testimony yesterday a
19 suggestion, I think it was of louvres?

20 **A. MR. LOCKE:** **Yes.**

21 Q. And, again, that's just a suggestion from you as to one
22 additional mechanism that might be used to prevent
23 entrainment; is that right?

24 **A. MR. LOCKE:** **Yes, that's correct, yeah.**

25 Q. Thank you. I think I'm done. I'm just going to check,

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Fitch

1 Mr. Chairman. One second.

2 Thank you, Mr. Locke. Those are all my questions.

3 I'm now going to turn things over to my colleague,
4 Mr. Barbero.

5 MR. BARBERO: Mr. Chair, good morning, sir. I
6 hope you can hear me okay?

7 THE CHAIR: No, we can't. It's pretty soft.

8 MR. BARBERO: Sir, is that better now?

9 THE CHAIR: A little bit, but you were much
10 clearer, and your volume was louder the other day with
11 your headset, so...

12 MR. BARBERO: Give me one minute, sir. I'll
13 disappear, but I'll be right back, I promise.

14 Mr. Chair, we've made some adjustment, I hope it's
15 coming across better?

16 THE CHAIR: It is better, but it's still --
17 Ms. DiPaolo, court reporter, can you hear him?

18 If you can just make sure your voice is up as much
19 as you can, I guess. -- try another headset, okay.

20 MR. BARBERO: Sir, they've given me a new
21 headset. Is that any better?

22 THE CHAIR: Maybe just pull the mic in front a
23 bit more and keep your voice up and I think we're going
24 to be close. Ms. DiPaolo figures she can get you
25 transcribed, so --

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Barbero

1 MR. BARBERO: To think --

2 THE CHAIR: Oh, that's better.

3 MR. BARBERO: And to think, sir, I thought my
4 biggest problem today was going to be the answers I
5 got. So here we go.

6 THE CHAIR: Right. So, actually, it is
7 improving. If you pull that your mic closer in front.
8 Thank you.

9 MR. BARBERO: Very good, sir.

10 Let me start off by just apologizing to the
11 document manager.

12 From the list that I forwarded yesterday, there's
13 three additional documents that I might ask just to
14 have pre-loaded, so I'll do that now so we don't waste
15 time.

16 Those are Exhibits 375, 175, 110. They will all
17 relate to my questions for Dr. Fennell.

18 But I'm actually going to start with Dr. Klepacki,
19 so there's a few minutes before I'll need those.

20 **MR. BARBERO CROSS-EXAMINES THE PANEL:**

21 Q. Dr. Klepacki, sir, are you there?

22 A. MR. KLEPACKI: Yes, sir. Good morning.

23 Good morning to the Board and Panel and all our
24 other participants. Here we are again.

25 Q. Good morning, sir. It's nice to see you.

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Barbero

1 I only have a few very short questions for you
2 this morning. So, hopefully, we can move through those
3 quickly.

4 **A. MR. KLEPACKI: Yes, sir.**

5 **Q.** I just wanted to start off, sir, by confirming that you
6 are in fact a member of the Springbank Communities
7 Landowners Group or SCLG; correct?

8 **A. MR. KLEPACKI: Yes, I believe my name is on the**
9 **list. To be honest, I haven't checked, but I suspect**
10 **it is.**

11 **Q.** I have, sir, and I can tell you you're 63 on the list
12 if case you were wondering.

13 **A. MR. KLEPACKI: Thanks.**

14 **Q.** Now, sir, the SCLG, you would agree, is opposed to the
15 approval of this project; correct?

16 **A. MR. KLEPACKI: Yes, sir.**

17 **Q.** And, sir, it's fair to say that SCLG is advocating for
18 an alternative?

19 **A. MR. KLEPACKI: I think that's a fair statement,**
20 **sir.**

21 **Q.** And, sir, is it fair to say that you're advocating for
22 an alternative to SR1?

23 **A. MR. KLEPACKI: Yeah, I -- yeah, the way I would**
24 **answer that question is I believe, like some of the**
25 **others, that an in-stream dam upstream from Bragg Creek**

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Barbero

1 would be a more equitable flood solution for all of us
2 who live along the river -- and I -- I don't want to
3 get too far down this road, but I also think
4 environmentally, it would be a better choice. Thanks.

5 Q. And, Dr. Klepacki, the SCLG submissions describes you
6 as a technical expert in the areas of aquatics, flood
7 frequency, and that you have special knowledge. I take
8 it you knew that's how they described you, sir?

9 A. **MR. KLEPACKI:** In speaking the truth, no, I
10 actually didn't. But I have deep interests in some
11 practices in all of those areas that you mentioned.

12 Q. Sir, just building on that, I just want to quickly ask
13 you a few questions about your educational background
14 and your relevant work experience.

15 So to start with, sir, it's fair to say that
16 you're educated as a geologist?

17 A. **MR. KLEPACKI:** I was educated as -- actually,
18 really, it was more rock mechanics that my -- my
19 doctorate was in, but I did do geology in the course of
20 that in my two other -- pursuing my two other degrees,
21 I also -- that -- those were more standard structural
22 geology and geology lines of inquiry.

23 Q. Rock mechanics. It sounds much better than the note I
24 have here for your PhD, which is geological sciences.
25 I think I prefer "rock mechanics," that sounds more

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Cross-examined by Mr. Barbero

1 interesting.

2 **A. MR. KLEPACKI:** Well, "tectonics" was the word
3 that was in vogue back then.

4 **Q.** And your professional work and experience over the
5 years, sir, as I read from your CV has mostly been for
6 oil and gas and mining companies?

7 **A. MR. KLEPACKI:** Hmm, mining, yes, sir. Like I
8 mentioned yesterday, I started off my degree with some
9 work, actually for BC Hydro.

10 **Q.** And, sir, I just want to also understand that the areas
11 that you're not particularly well-versed in, and one of
12 them, sir, is you're not a hydrologist; correct?

13 **A. MR. KLEPACKI:** No, I have -- I have no -- I don't
14 have an academic background in hydrology, other than
15 aqueous geochemistry.

16 **Q.** And similar question, sir, with regards to engineering,
17 you're not an engineer; correct?

18 **A. MR. KLEPACKI:** No, I am not -- I was never
19 designated an engineer.

20 **Q.** Thank you, sir.

21 On Friday, you spoke quite well, sir, about your
22 concerns regarding erosion associated with the
23 low-level outlet works.

24 And we don't need to turn it up, but as you know,
25 sir, there was an exhibit, I believe it was 264, that

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Cross-examined by Mr. Barbero

1 was some documents that you prepared on the issue of
2 erosion and river bed integrity.

3 And, sir, I just want to make sure that I
4 understand. Your concerns relate to the area of the
5 Unnamed Creek and the Elbow River downstream from
6 there; correct?

7 **A. MR. KLEPACKI:** Yes, sir.

8 **Q.** And correct me if I'm wrong, but I do believe that you
9 acknowledged in your evidence on Friday that
10 Alberta Transportation was, in part, addressing some of
11 the erosion concerns that you had at the low-level out
12 work (verbatim); is that correct?

13 **A. MR. KLEPACKI:** Yeah, it seemed to me that the --
14 the methods of addressing that were going to -- to
15 install energy baffles to -- to break up the flow as it
16 was -- as it was going.

17 And I believe my recommendation or hope, or
18 however I worded it, was for riprap downstream from the
19 outlet to help control erosion of the Unnamed Creek
20 between the outlet and the Elbow River.

21 **Q.** Right. Document host, could I please have Alberta
22 Transportation Aid to Cross Number 3.

23 Sir, do you have that diagram on your screen?

24 **A. MR. KLEPACKI:** Yes, sir.

25 **Q.** So we submitted this to your counsel and the Board, I

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Cross-examined by Mr. Barbero

1 believe, far too late in the evening on Sunday night,
2 but we did circulate it, and I'm wondering, sir, have
3 you had a chance to look at this?

4 **A. MR. KLEPACKI:** Yes, I did see it. I did see it
5 at that time.

6 Q. Very good, sir, and I'm wondering --

7 **A. MR. KLEPACKI:** Go ahead.

8 Q. Right. So this version of the diagram, have you seen
9 this before, sir, or was the first time you saw this
10 when I, or Alberta Transportation, circulated it Sunday
11 evening?

12 **A. MR. KLEPACKI:** Yes, that was the first time. I
13 didn't see it in -- in the submission that we had
14 gotten, you know, the final draft of December 2020,
15 but --

16 Q. Right. Right.

17 **A. MR. KLEPACKI:** -- but this was the first time.

18 Q. And, sir, some of the other changes -- and document
19 host, we can take that diagram down now -- some of the
20 other changes, sir, that we talked about in relation to
21 erosion protection, you understand that those are set
22 out at Exhibit 138, being NRCB Round 2 IR response? Do
23 you have any knowledge of that, sir?

24 **A. MR. KLEPACKI:** I -- I would have to see the
25 diagram to actually have it -- have it click. I'm not

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Cross-examined by Mr. Barbero

1 a lawyer. I don't think very well in exhibits and PDF
2 numbers, so I'm sorry.

3 Q. I am a lawyer, and I don't think well in them either,
4 sir, so no need to apologize.

5 Mr. Chair, might I ask that we mark that diagram
6 as an exhibit, and that would be our Aid to Cross
7 Number 3. I would ask that we mark it as an exhibit if
8 possible.

9 THE CHAIR: So it was not previously marked as
10 an exhibit?

11 MR. BARBERO: No, sir, it was not.

12 THE CHAIR: Okay, thank you.

13 So, Ms. Friend?

14 MS. FRIEND: That would be Number 387.

15 MR. SECORD: Just a quick question.

16 So Aid to Cross Number 3, you asked Dr. Klepacki
17 if he'd seen it before. So is it on the record
18 somewhere else?

19 MR. BARBERO: No, Mr. Secord, I don't believe it
20 is, subject to me confirming that, but I don't believe
21 it is.

22 MR. SECORD: So I don't know how we could have
23 seen it before, then, if it was just provided to us on
24 Sunday.

25 MR. BARBERO: That's what I meant, had he seen

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Cross-examined by Mr. Barbero

1 it before today, sir.

2 MR. SECORD: Oh, okay. So between Sunday and
3 today, I'm sorry.

4 MR. BARBERO: Thank you.

5 MR. SECORD: I have no objection.

6 MR. BARBERO: Thank you, Mr. Secord.

7 THE CHAIR: So, Ms. Friend, that's correct,
8 387?

9 MS. FRIEND: Yes.

10 **EXHIBIT 387 - AT AID TO CROSS NUMBER 3**

11 Q. MR. BARBERO: Dr. Klepacki, sir, I think in your
12 evidence on Friday, and correct me if I have this
13 wrong, but I believe you said the flows from the
14 low-level out work (verbatim) would be between
15 12 metres cubed per second and 20 metres cubed per
16 second. Do I have that right?

17 A. MR. KLEPACKI: 20 metres cubed per second is, of
18 course, the maximum flow, from my readings of all of
19 the dozens of pages; and when you look at the discharge
20 graphs -- and I'm sorry, I don't -- I don't remember
21 the exhibit and PDF numbers for those, but I'm sure
22 somebody on your team does -- when you look at those
23 discharge graphs, it looks like, mostly, they plan to
24 release at about 12 or 15 cubes, and -- and then it
25 tapers -- it continues at that almost same level for,

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Cross-examined by Mr. Barbero

1 you know, 30 or 40 days, and then -- and then suddenly
2 tapers off to next to nothing when the reservoir
3 drains.

4 Q. Sure. And, sir, maybe just to assist you, why don't we
5 bring that up so you can see those diagrams. I believe
6 you're referring, document host, to Exhibit 264. I
7 would imagine it's PDF page 5, if we could bring that
8 up?

9 Dr. Klepacki, sir, are these the diagrams you were
10 referring to a moment ago?

11 A. MR. KLEPACKI: No. Actually, it was -- it was
12 some Stantec diagrams that showed in something that I
13 guess what we were talking about with -- with Mr.
14 Locke's cross, and that was the release -- the release
15 volumes from the low outlet flow.

16 Let me see if I have them written down somewhere.
17 So it's the release scenarios, and it describes the
18 amount of flow that's going back into the Elbow from
19 the dam -- these documents right here, Mr. Barbero,
20 that is just the -- you know, annual hydrographs for
21 Elbow River at Bragg Creek, you know, upstream, and it
22 shows what the -- what the flow rates are.

23 So, you know, my concern, when I was talking about
24 the discharge amounts, my concern was that the flow
25 coming out of -- of the low-level outlet, you know,

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Cross-examined by Mr. Barbero

1 could be as high as 27 cubic metres per second. What
2 you can see is, if you look at where, you know, July
3 and August might be, that's closer to 10, 10 cubic
4 metres per second, so that would be twice the flow of
5 the river.

6 And -- and then the other planned outlet, which
7 seemed to be more typical of what the discharge plans
8 were, seemed to be somewhere around 12 or 15 cubes --
9 is that me -- 12 or 15 cubes per -- per second, which
10 basically is another Elbow River volume going into it.
11 That was the point I was trying to take, Mr. Barbero.

12 Q. No, thank you for that clarification, sir.

13 Let me ask you this, then, sir: Are you aware
14 that the annual average flood of the river in this
15 reach presently, without SR1, is 70.9 metres cubed per
16 second?

17 A. MR. KLEPACKI: Yeah, so in the fourchette, yeah,
18 I am -- I am aware that it can get to be that high.
19 You can -- you can look at this hydrograph right here,
20 and you can see, you know, it's a lot of rhythmic scale
21 on the Y axis, but you can see that it approaches 70 in
22 2002/2003, and, you know, probably about 60 or so in
23 2003/2004. Yeah, 50 to 80 cubes. For these years. Of
24 course, it varies, depends upon which year you're
25 sampling.

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Cross-examined by Mr. Barbero

1 Q. Right. Of course, sir, you understand that SR1 will
2 not operate every year; correct?

3 A. MR. KLEPACKI: Yes, I understand that.

4 Q. Document host, we can take that document down.

5 Sir, just one more question on this point. I
6 guess my question is this, sir: Are you aware that
7 Alberta Transportation has assessed the impact to
8 bedload on the Elbow River associated with SR1?

9 A. MR. KLEPACKI: Yeah, I did -- I believe some
10 months ago, I read that. I'm trying to recall when it
11 first came out. Perhaps it was in the 2017 or 2018 IR
12 responses, and when they looked at bedload and TSS and
13 some of the other water quality parameters. I do
14 remember reading those things.

15 Q. Thank you, sir. And maybe just for the sake of helping
16 the panel, I can advise that that is found at NRCB
17 Round 2 IR 23, which is Exhibit 138, and also at
18 Appendix 23-1, which is Exhibit 140.

19 Sir, you said Friday, and I believe I read it in
20 your materials, that there is significant risk, in your
21 view, that the Springbank Off-Stream Reservoir is
22 underdesigned for large events in the future. Is that
23 a fair summation?

24 A. MR. KLEPACKI: Yeah, that's a fair summation.

25 Q. And I think, sir, that part of that premise or

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Cross-examined by Mr. Barbero

1 conclusion, I guess, is that, in your view, Alberta
2 Transportation should have considered flood events for
3 years such as 1879, 1897, and 1902; is that correct?

4 **A. MR. KLEPACKI:** Yeah, that -- that's correct,
5 although I think my points align pretty well with what
6 Dr. Fennell was saying too, that it's important to
7 include those tail events, especially when one looks
8 into the future.

9 Q. Right, sir. And you and I can agree that there's, for
10 lack of a better word, no data for those floods in
11 relation to the Elbow; correct?

12 **A. MR. KLEPACKI:** I -- yeah, there's -- there's no
13 measurement for those floods, yeah. I -- I -- that's a
14 fair statement.

15 Q. And, in fact, sir, to be fair to you, you say as much
16 in your report, Exhibit 263, or I guess, more
17 accurately, your documents at Exhibit 263. Now, I'll
18 read it to you, sir, because, as I said, you were quite
19 fair, and you said: (as read)

20 "There are no measurements for the flow
21 rate of the 1879, 1897, and 1902 events
22 for the Elbow River."

23 You then, though, again, sir, to be fair, go on to say:
24 (as read)

25 "The flow estimates for these events

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Cross-examined by Mr. Barbero

1 were calculated from high water marks on
2 the CP Rail bridge over the Bow River."

3 **A. MR. KLEPACKI:** Yeah, that's for the 1897 event.
4 The 1879, I think, is just entirely historical
5 anecdotal.

6 **Q.** Right. And, so I guess, sir, my question rises --
7 arising out of that is this: Do you have any evidence,
8 sir, to show that Elbow -- or that every time there is
9 a flood on the Elbow, there is a flood on the Bow; that
10 every time there's a flood on the Bow, there's a flood
11 on the Elbow. Do you have any evidence to corroborate
12 that correlation?

13 **A. MR. KLEPACKI:** I know that -- I believe somewhere
14 I read or saw a correlation from that.

15 This goes to a topic that -- that I think we've
16 discussed in terms of the rainfall distribution in the
17 Foothills area and the centroids, I guess is the word
18 that Mr. Frigo used when he was describing the rainfall
19 distributions.

20 I think one think to keep in mind when you
21 consider the synchronicity of floods on both watershed
22 systems, when you look at those -- and I did this --
23 when you look at the -- the aerial distribution of
24 those centroids going from 200 millimetres to 200
25 millimetres of the iso-precipitation contours, for

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Cross-examined by Mr. Barbero

1 2013, those were 125. They tend to be oval shaped, as
2 opposed to circular, and it's 125 kilometres in the
3 direction of the long axis of that ellipse, and it
4 is -- John Pomeroy also had 120 for 20 kilometres for
5 the 2013. And the 2005 one was 180 kilometres in the
6 long axis.

7 So the point being that likely, rainfall events on
8 the Elbow or the Bow are going to have some effect in
9 all the systems, but that effect, as was pointed out,
10 is not going to be the same for both catchment areas.

11 Sorry, that was a long-winded answer.

12 Q. No, no, it's quite helpful. Thank you, sir.

13 It does make me think of one particular scenario
14 that I was wondering if you can help me understand and
15 that is this: Would you agree, sir, that the Elbow
16 River experienced a major flood in 1932? And I can
17 take you to the reference in the material for that, but
18 if we don't need to go there, I suppose can we just
19 agree on that point, sir?

20 A. **MR. KLEPACKI:** Oh, yes, we can agree on that
21 actually. Barbara Tegtmeyer who lives about
22 200 metres down the road here remembers that flood very
23 well as a little girl.

24 Q. And sir, you'd agree with me that we don't have
25 corresponding evidence of that flood on the Bow, do we?

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Cross-examined by Mr. Barbero

1 **A. MR. KLEPACKI:** Let me just take a look.

2 **Q.** And in particular, sir, I was most interested in the
3 tree ring graphs?

4 **A. MR. KLEPACKI:** Oh, yeah, no. There is a 1930 --
5 is it 1933 or '32? I can't -- it's hard to see on my
6 diagram. I don't know if (connection interrupted) --
7 but if you go to the maximum --

8 **Q.** Dr. Klepacki, Dr. Klepacki, sir?

9 **A. MR. KLEPACKI:** Yes, sir?

10 **Q.** Sorry to interrupt you. My correction froze there. I
11 don't know if the Chair and the court reporter lost
12 you, but I lost you there when you held up that
13 document, sir.

14 **A. MR. KLEPACKI:** So if you could go to -- if you
15 could please go to Exhibit 263, PDF 2.

16 **Q.** Is that Figure 2, Dr. Klepacki?

17 **A. MR. KLEPACKI:** Yes, sir. And if you look at
18 1932, that's the question.

19 **Q.** Actually, sir, I don't know that it is. Is this the
20 tree ring information, sir?

21 **A. MR. KLEPACKI:** No, this is the -- this is the
22 measured discharge --

23 **Q.** Right.

24 **A. MR. KLEPACKI:** -- for -- for these areas here.

25 Just a second. Actually I'm bringing up my spreadsheet

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Cross-examined by Mr. Barbero

1 which I -- I'm not -- I don't want to -- I don't want
2 to overkill this.

3 So I have -- Bow River 1932. I actually have
4 quite a --

5 Yeah, Bow River max was 1,520 cubic metres per
6 second for 1932.

7 So the river was a -- the Bow River was also in
8 flood on -- on that year.

9 Q. Right, sir.

10 A. MR. KLEPACKI: This is the Alberta Environment.

11 Q. Right, but I guess I'm still wondering -- I'm still
12 wondering about that tree ring data that I think you
13 and others have put forward, sir. Would you agree with
14 me that the tree ring data does not demonstrate a major
15 flood in the Bow in 1932, and if there's a document,
16 you can --

17 A. MR. KLEPACKI: I think we've covered this, the --
18 yeah, I'm looking for my tree ring, the tree ring data.

19 If you can go to also Exhibit 263, PDF 8, okay,
20 and zoom in please, document manager. Can we look at
21 the '30s a little closer, which is on the right-hand
22 side. So it's -- it's difficult to see there, but you
23 can see these are 25-year increments between the
24 hashtags. And so 19 -- 1932 would be -- there's a
25 small red bump in the middle of there. 1932 would be

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Cross-examined by Mr. Barbero

1 on the inflexion point on the downward side of that --
2 of that bump, as far as I could read it.

3 So yeah, there's not a distinct wet -- wet
4 correlation in that data.

5 Q. Dr. Klepacki, sir, as somebody that reads transcripts
6 late into the evening, it can be difficult. So for the
7 sake of the transcript, can you describe exactly which
8 diagram you're looking at of these?

9 A. MR. KLEPACKI: So -- so I am looking at -- I am
10 looking at the third diagram down, which is the
11 Bow River data. And if you look at 1925, and like I
12 said, it's 25 -- so in the middle of each division is
13 going to be 12 years, which is going to be about where
14 the trough is. So it's -- like I said, it's going to
15 be on the decreasing slope on the side of -- to the
16 right-hand side of 1925 on the third diagram down.

17 Q. Right. And, as you say, sir, it's decreasing, isn't
18 it?

19 A. MR. KLEPACKI: Yeah, in that case, it's going
20 from a peak -- from a bit of a wetter spell in 1925 to
21 what looks like -- if you -- if you could add 12 --
22 1937 somewhere would be the trough in that diagram.

23 Q. Very good, sir.

24 A. MR. KLEPACKI: Third diagram down.

25 Q. Thank you, sir. That was -- that was helpful.

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Cross-examined by Mr. Barbero

1 Sir, a moment ago you mentioned --

2 A. MR. KLEPACKI: So...

3 Q. I'm sorry, sir, did you want to add something?

4 A. MR. KLEPACKI: Well, yeah, and maybe I mean, I
5 would say, you know, it is true that -- I mean, and I
6 still certainly subscribe to the concept that climate
7 drivers drive wet and dry periods, particularly as we
8 talked yesterday, the concatenation of the Pacific
9 Decadal Oscillation and El Niño Southern Oscillation.
10 But there are other factors as, you know -- fires, as
11 John had mentioned, previous forest fires creating, you
12 know, higher percent of run-off in the wildfire zone.

13 So those are other factors that contribute to
14 flooding. Flooding's not entirely climate-driven, but,
15 you know, and unfortunately, I don't have a percentage
16 of what floods are -- are entirely climate-driven, but
17 there are other parameters too.

18 THE CHAIR: Sorry, just to interrupt. My
19 apologies.

20 Ms. DiPaolo, did you catch that last -- okay, I
21 can see -- in particular, if you're talking about
22 extremely technical or new terms, if you could just go
23 slowly during that piece, Mr. Klepacki or others, just
24 to give our court reporter half a chance at that. So
25 thank you very much.

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1 A. MR. KLEPACKI: I'm sorry. Yes, I did hear you
2 saying to Ms. DiPaolo this morning about making sure
3 that she catches the technical jargon. So I will do my
4 best, sir. I apologize.

5 Q. MR. BARBERO: Dr. Klepacki, sir, a moment ago, I
6 believe you mentioned John Pomeroy; did I hear that
7 right?

8 A. MR. KLEPACKI: That's correct, sir.

9 Q. And I'm going to come back to Dr. Pomeroy in a second,
10 but I wanted to ask you this first: Is it your view or
11 the view of SCLG that, with a warming climate, there
12 will be larger floods at more frequent intervals?

13 A. MR. KLEPACKI: It is -- it is my view -- I don't
14 know whether I actually have the crown of SCLG, but it
15 certainly is my view -- and the physics of it are very
16 straightforward, as Dr. Fennell mentioned yesterday.
17 With a higher heat content in the atmosphere, there is
18 a higher water capacity. And the bottom line is the
19 sponge can carry more water. So when you squeeze the
20 sponge, like in upslope weather conditions, you're
21 going to get more rain.

22 So the atmosphere can hold more water, and if you
23 follow some of the literature on -- on climate and
24 weather events, I mean that's happening already.

25 These, quote unquote, super storms, such as the

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Cross-examined by Mr. Barbero

1 rainfall event in Australia that we just experienced
2 are -- are, in part, at least linked to this increase
3 of humidity capacity of the atmosphere. And here we
4 go.

5 Q. Sir, on Sunday, I circulated an additional aid to
6 cross.

7 Document manager, if you could please bring that
8 up now.

9 It was identified as Aid to Cross SCLG Number 2,
10 and what it is is a paper prepared by Ms. Tesemma.

11 Dr. Klepacki, sir, have you had a chance to
12 review, or to at least be advised, of this aid to cross
13 that I circulated?

14 A. MR. KLEPACKI: No, I haven't had a chance to look
15 at this paper yet.

16 Q. Were you alerted that I circulated it earlier this
17 week?

18 A. MR. KLEPACKI: In -- in all honesty since I've
19 affirmed, no, I didn't. This one -- this one slipped
20 off the desktop.

21 Q. No problem, sir.

22 This paper, as I mentioned is authored by, among
23 others, Ms. Tesemma, but I believe it's also authored
24 by John Pomeroy. Do you see his name there?

25 A. MR. KLEPACKI: Yes, I see. He's the final

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1 author.

2 Q. If we could scroll down to the executive summary, it
3 notes here that: (as read)

4 "This report assesses the impacts of
5 projected climate change on the
6 hydrology, including the flood
7 frequencies of the Bow and Elbow Rivers
8 above Calgary, Alberta."

9 Do you see that?

10 A. MR. KLEPACKI: Yeah. Yes, sir.

11 Q. Thank you, sir. And it goes on, so about the third
12 sentence: (as read)

13 "The study developed a methodology and
14 applied a case study for incorporating
15 climate change into flood frequency
16 estimates that can be applied to a
17 variety of river basins across Canada."

18 Do you see that?

19 A. MR. KLEPACKI: Yes, sir, I see that.

20 Q. And I think in your materials, you spoke quite highly
21 of Dr. Pomeroy, did you not, sir?

22 A. MR. KLEPACKI: Yeah, I think -- I think all of us
23 who are involved in the water in Western Canada, he's
24 recognized his -- his work, and his current position as
25 head of the Global Water Forum, so...

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Cross-examined by Mr. Barbero

1 Q. And not to belabour the point, sir, but you described
2 him as, quote, "a world-renowned hydrologist." I'm
3 sure he'd be happy to hear that --

4 A. MR. KLEPACKI: Hence, the Global Water Forum.

5 Q. Sir, my question for you is, in preparing your
6 materials, I take it you've -- you did not review or
7 include the findings or conclusions of this paper, did
8 you, sir?

9 A. MR. KLEPACKI: That's a fair statement,
10 Mr. Barbero. Thank you.

11 Q. And, in fact, sir, as you said at the outset, you've
12 not seen this before, have you?

13 A. MR. KLEPACKI: No, I haven't.

14 Q. Very good.

15 MR. BARBERO: Mr. Chairman, may I have this
16 marked as the next exhibit, please?

17 THE CHAIR: Yes. Ms. Friend?

18 MR. SECORD: Just one -- just one --

19 THE CHAIR: This is Mr. Secord, just for the
20 court reporter.

21 MR. SECORD: Yes, just one point here. You
22 know, Dr. Klepacki hasn't seen this document, he hasn't
23 reviewed this document. You've read two sections from
24 an executive summary.

25 I'm just wondering, you know, what is the aid to

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Cross-examined by Mr. Barbero

1 cross going in for? That he hasn't seen the document?

2 MR. BARBERO: That's correct, Mr. Secord.

3 MR. SECORD: Okay. I guess on that basis,
4 Mr. Chair, I have no objection.

5 THE CHAIR: Thank you, Mr. Secord.

6 **EXHIBIT 388 - SCLG AID TO CROSS**
7 **NUMBER 2**

8 MR. BARBERO: Mr. -- my apologies --
9 Dr. Klepacki, just one more question for you before I
10 let you go, sir.

11 I just want to make sure that we're clear and that
12 you have clarity on how the SR1 is intended to operate.

13 Sir, you understand that SR1 will not be flooded
14 every five years for test purposes; correct?

15 A. MR. KLEPACKI: So that was something that I had
16 read somewhere at least a year ago, and I haven't seen
17 the operation manual now.

18 I -- I heard another statement -- and I'm trying
19 to remember the source of that statement -- was that
20 they can do the operational -- the mechanical testing
21 of the equipment in a dry land state.

22 So this is the extent of my knowledge over the
23 requirements of -- of the -- the requirements that the
24 operators of SR1 will have to follow according to --
25 according to whatever civil engineering standards are

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Cross-examined by Mr. Barbero

1 present in Alberta.

2 So I'm -- I don't know what those requirements are
3 right now, Mr. Barbero.

4 Q. So, sir, just so we're clear, you understand that there
5 is no plan to flood SR1 once every five years for
6 purposes of testing?

7 A. MR. KLEPACKI: What's the source of -- what's
8 the -- I'm not questioning your authority, I'm just
9 wondering what the source of that is. Is that -- that
10 statement is -- is that something that was written in
11 somewhere in the documents?

12 Q. Yes, sir. Perhaps I can assist with that.

13 Document host, could I have -- sorry, could I have
14 Aid to Cross Number 1?

15 THE CHAIR: Mr. Barbero, I don't know if we
16 actually heard Ms. Friend get an exhibit number for the
17 last exhibit.

18 Ms. Friend, what was that?

19 MS. FRIEND: That number will be 388.

20 THE CHAIR: Okay, thank you.

21 And we'll see where we go here and we'll see if
22 Mr. Secord has any objections. Has this been entered,
23 this aid to cross?

24 MR. BARBERO: It has.

25 Mr. Chair, just on that point, sir, yes, I've

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1 circulated this aid to cross again on Sunday evening.

2 THE CHAIR: Okay. So let's proceed, then.

3 We'll attach later, okay? Thank you.

4 MR. BARBERO: Thank you, sir.

5 Q. Dr. Klepacki, you were asking me the source of my
6 question, and the source of my question is this news
7 article from CTV News 2019.

8 If we scroll down, sir, I believe it would be
9 PDF 3.

10 Just at the top there, sir: (as read)

11 "Retired Geophysicist, Dave Klepacki
12 notes that the land would extensively be
13 damaged..."

14 Quote -- and this is this next paragraph below:

15 (as read)

16 "When you release that water every five
17 years, it's a large shallow reservoir
18 and that water will likely have blue
19 algae and so you'll send all that
20 downstream and cost the City of Calgary
21 almost double."

22 Do you see that, sir?

23 A. MR. KLEPACKI: Yes.

24 Q. And then, I think, in the quote above it, sir, it says,
25 "Every five years, they have to --" well, let me just

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1 read it: (as read)

2 "When you flood it, it gets covered with
3 mud and you have to flood it every five
4 years to make sure that the off-stream
5 reservoir system works."

6 Do you see that?

7 A. MR. KLEPACKI: Yes, I do.

8 Q. And, sir, I just want to make sure that there's no
9 confusion. You understand that that's not the case;
10 correct, sir?

11 A. MR. KLEPACKI: Well, Mr. Barbero, what I was
12 wondering was -- I hear you telling me -- and don't get
13 this wrong, I don't -- I don't -- I'm not questioning
14 that, but -- so the operations plans -- I mean, can you
15 tell me how they test them? How they're going to test
16 that? And I agree it may not be five years, they may
17 not have to do a wet test -- but I don't know what the
18 requirements are by the -- whatever it is, the Canadian
19 Dam Commission or in terms of the equipment testing,
20 that's the point I'm trying to make.

21 At that time, I did -- someone had -- someone who
22 I thought had authority in civil engineering had told
23 me it had to be tested every five years when -- when
24 that interview was done.

25 But I -- I need to be corrected in -- in

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Cross-examined by Mr. Barbero

1 understanding the laws that apply to -- or the
2 regulations that apply to equipment testing for a
3 project like this --

4 Q. Right. So --

5 A. MR. KLEPACKI: -- and I -- I need to come up to
6 speed.

7 Q. Right, sir. No, that's fair. Unfortunately, given our
8 system, sir, I can't give evidence, but perhaps that's
9 something we can discuss or you can discuss with
10 Alberta Transportation.

11 I won't belabour this point, sir. I think we've
12 hashed it out.

13 Mr. Chairman, may I have one or two moments just
14 to review my notes, and I may be done with
15 Dr. Klepacki.

16 THE CHAIR: This has not been entered as an
17 exhibit. Mr. Secord, if you have no objection, we
18 should have an exhibit number on this aid to cross.

19 MR. SECORD: No objection.

20 THE CHAIR: Thank you.

21 Ms. Friend.

22 MS. FRIEND: This will be Number 389.

23 THE CHAIR: Thank you.

24 **EXHIBIT 389 - ALBERTA TRANSPORTATION**

25 **TOPIC 4 AID TO CROSS 1, CTV NEWS**

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Cross-examined by Mr. Barbero

1 **ARTICLE**

2 THE CHAIR: And please take a minute,
3 Mr. Barbero.

4 MR. BARBERO: Thank you, sir.

5 MR. KRUHLAK: Mr. Chairman, it's Ron Kruhlak.

6 Perhaps I could just deal with a matter while
7 Mr. Barbero's reviewing his notes.

8 THE CHAIR: Please proceed.

9 MR. KRUHLAK: Mr. Secord asked about having some
10 interest in expediting the response on Undertaking 31,
11 and I just want to advise him that -- that response has
12 been sent a short time ago, so he should have that
13 pertaining to the data he was looking for.

14 And we could either mark that now, the response to
15 Undertaking 31, that has just been sent to Ms. Friend
16 and copied to Mr. Secord, or I'm happy if he wants to
17 have a chance to look at it first.

18 MR. SECORD: Thank you, Mr. Kruhlak. I did get
19 a communication from Ms. Singh, and I thank you very
20 much for expediting that. We'd be happy to have it as
21 an exhibit.

22 And I have forwarded it to Dr. Fennell, obviously,
23 just forwarded the email from Ms. Singh without any
24 comment, I understand he's under cross. So he now has
25 that should he wish to comment on it. Thank you.

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1 THE CHAIR: Mr. Kruhlak, that's been sent to
2 Ms. Friend and Mr. Kennedy in advance?

3 Thank you. Okay.

4 MR. SECORD: And we could mark that as an
5 exhibit number.

6 THE CHAIR: Ms. Friend.

7 MS. FRIEND: That will be Exhibit Number 390.

8 MR. SECORD: Thank you.

9 MR. KRUHLAK: Thank you, Mr. Chairman.

10 THE CHAIR: Thank you, Mr. Kruhlak.

11 **EXHIBIT 390 - AT RESPONSE TO**

12 **UNDERTAKING 31**

13 MR. BARBERO: Mr. Chair, it's Michael Barbero
14 again.

15 THE CHAIR: Yes, please proceed.

16 MR. BARBERO: I have no further questions for
17 Dr. Klepacki.

18 Sir, thank you very much for your time over the
19 last few days and for answering my questions just now.

20 A. MR. KLEPACKI: Thank you, Mr. Barbero.

21 Can I just make a closing statement? Is it -- is
22 that a possibility or something like that?

23 MR. BARBERO: Dr. Klepacki, Chair, I would say
24 not at this time.

25 MR. SECORD: No.

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1 THE CHAIR: This is not the time. I would
2 agree. Thank you.

3 MR. SECORD: I would agree, also. Thank you.

4 MR. KLEPACKI: Thanks. Sorry, you guys.

5 THE CHAIR: No worries. Thanks for asking,
6 Mr. Klepacki.

7 So, Mr. Barbero, next up?

8 MR. BARBERO: Dr. Fennell, sir.

9 THE CHAIR: Thank you. We'll just give
10 Mr. Wiebe one second. Thank you, Mr. Wiebe.

11 Q. MR. BARBERO: Dr. Fennell, good morning?

12 A. MR. FENNELL: Good morning, Mr. Barbero.

13 Q. Sir, yesterday you gave a very passionate direct. I
14 have a few questions arising from that.

15 Sir, I take it from your evidence yesterday that
16 you are opposed to SR1?

17 A. MR. FENNELL: I'm -- I'm certainly for a project
18 that is going to provide protection for all people and
19 property.

20 Q. So, sir --

21 A. MR. FENNELL: And I understand that flood
22 mitigation is important, obviously, for the city of
23 Calgary and the region.

24 So I would say that, you know, I'm neither for or
25 against. I'm actually for a project that's going to

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Cross-examined by Mr. Barbero

1 provide the highest level of protection possible.

2 Q. So, sir, just so I understand, you're neither for or
3 against SR1? Is that your position?

4 A. MR. FENNEL: Yeah, I'm for a project that is a
5 well-conceived project that's going to protect as many
6 people and property as possible.

7 Q. Sir, you make reference to MC1 in your materials. You
8 know MC1 is not a reviewable project before this Board
9 at this time?

10 A. MR. FENNEL: I understand that, yes. I mean,
11 early on in the process, Mr. Barbero, it was an option
12 that was being reviewed. Obviously, it was not the one
13 that was advanced. But reading the Opus report, it
14 does have some significant merits to it.

15 Q. But you understand it's not a reviewable project in
16 this proceeding?

17 A. MR. FENNEL: I understand that, yes.

18 Q. Sir, I have a few questions regarding your CV, which is
19 Exhibit 362 -- I'm sorry, 262.

20 I don't believe we need to turn it up, sir, but
21 you can tell me if you feel we do.

22 I just want to confirm my understanding that you
23 are a hydrologist and a geochemist. Is that a fair
24 statement?

25 A. MR. FENNEL: No, there's one correction,

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Cross-examined by Mr. Barbero

1 **Mr. Barbero. I'm a hydrogeologist and a geochemist.**

2 **Q. Hydrogeologist and geochemist. Thank you, sir.**

3 **A. MR. FENNEL:** **The difference being that hydroge**
4 **is a marriage of geology, fluid flow, and chemistry,**
5 **and biology. And hydrology is more the study of**
6 **surface water flows and dynamics.**

7 **Q. Thank you for that correction, sir. That's helpful.**

8 And I perused your very extensive work experience,
9 and it struck me that you've had positions largely as a
10 petroleum geologist, senior hydrogeologist, principal
11 hydrogeologist, and a geochemist. Is that a fair
12 summary of most of your professional work?

13 **A. MR. FENNEL:** **Yes, I would say most of the work**
14 **has been related to the water side, as opposed to the**
15 **oil and gas side. But I am well-versed in both.**

16 **Q. Sir, you do not hold any degrees in atmospheric**
17 **science, do you?**

18 **A. MR. FENNEL:** **No, I don't.**

19 **Q. Sir, you are not a geotechnical engineer, are you?**

20 **A. MR. FENNEL:** **I'm not a geotechnical engineer,**
21 **no.**

22 **Q. Nor are you a structural engineer?**

23 **A. MR. FENNEL:** **No.**

24 **Q. Very good, sir.**

25 **Sir, you'd also --**

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Cross-examined by Mr. Barbero

1 A. MR. FENNELL: If I can, I'd like to say that,
2 you know, I do have a general knowledge in these areas
3 just through my work experience, but I'm not an expert
4 in this at all.

5 But, you know, as a hydrogeologist, we have to
6 understand the -- the geotechnical natures to some
7 degree when we're talking about stress fields and pore
8 pressures. So that is something that we do study.
9 Just wanted to make that clear.

10 Q. Thank you, sir.

11 In that same vein, though, sir, you'd agree that
12 you are not an expert on human health?

13 A. MR. FENNELL: No, I'm not a toxicologist, so I
14 don't -- I don't have that background.

15 Q. Sir, you're not --

16 A. MR. FENNELL: I have been involved in some human
17 health and ecological risk assessments, so I have --
18 I'm familiar with the process.

19 Q. Well, sir, I've searched your CV, and I could only find
20 one reference to health, and that was assistance you
21 offered in the development of assessment programs to
22 generate Tier II criteria in support of human health.

23 Is there some other experience that I missed?

24 A. MR. FENNELL: I've been involved in a number of
25 risk assessments in the oil sands. You know, looking

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Cross-examined by Mr. Barbero

1 at the risk to receiving bodies, water bodies, you
2 know, and aquatics on a broad level. Although I don't
3 have the expertise in those areas, I have been working
4 with teams of people. So I've kind of osmosed some of
5 that -- you know, some of that information and --
6 and -- and how that's rolled out in a -- in a risk
7 assessment.

8 But I'm not a professional risk assessor or
9 toxicologist, no.

10 Q. Sir, you're also not an expert in air quality; correct?

11 A. MR. FENNELL: No. Not air quality, no.

12 Q. Sir, are you a member of the Canadian Meteorological
13 and Oceanographic Society?

14 A. MR. FENNELL: No, I'm not. But I will say --
15 and I know where this is going, obviously, it's -- your
16 questioning -- but I have to say that, you know, the
17 information that's -- that's being used, the
18 atmospheric information, all of this data is provided
19 by reputable organizations and has been vetted through
20 those organizations, and that information gets used;
21 and as a practitioner in the water field, I have to
22 understand the drivers of the climate, precipitation,
23 you know, and things like run-off.

24 And so all of those things -- and Alberta
25 Transportation would be the same way, I don't think

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Cross-examined by Mr. Barbero

1 they have particular experts in those areas either. So
2 what we're doing is we're working with information that
3 we trust from these organizations and assessing
4 accordingly.

5 Q. Sir, yesterday, you presented a PowerPoint, I believe
6 that's Exhibit 384. We may want to bring it up in a
7 few moments, but it's not necessary right now.

8 Sir, I just want to confirm, the PowerPoint
9 contains new information and opinion that is not found
10 in your report filed at Exhibit 261; correct?

11 A. MR. FENNELL: I think you'd have to point me to
12 where that is.

13 Q. Sir, where in your report at Exhibit 261 is there any
14 mention of MC1 or McLean Creek?

15 A. MR. FENNELL: That, I don't know. I'd have to
16 go back and have a look --

17 Q. Sir, can you --

18 A. MR. FENNELL: Subject to check, I will -- I will
19 say you're probably correct.

20 Q. Okay, thank you. Document host, could we have Slide 2
21 of the PDF presentation Exhibit 384.

22 Sir, with regards to the first bullet, you state
23 that:

24 Climate change, including the impacts
25 from extreme flood and drought

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Cross-examined by Mr. Barbero

1 conditions and how that might affect the
2 safe and efficient operation of SR1..."
3 ...are a major concern. Do you see that, sir?

4 A. MR. FENNELL: I do, yes.

5 Q. Sir, you'd agree, you're not qualified to speak to dam
6 safety issues, are you, sir?

7 A. MR. FENNELL: No, I'm not.

8 Q. Sir, you'd agree that you are not qualified to speak to
9 dam operations issues, are you, sir?

10 A. MR. FENNELL: No.

11 Q. Sir, at the bullet on the next slide, Slide 3, last
12 bullet, you state --

13 A. MR. FENNELL: If I could -- if I could just make
14 a comment before you move on, if we could go back.

15 What that -- what that bullet is meant to identify
16 is that the impacts from extreme flood and drought will
17 have some implications for the operation of SR1.

18 And the fact that climate change is going to be a
19 factor to be considered, that point is meant to say
20 that, it is a concern, and it needs to be acknowledged,
21 and it needs to be addressed accordingly to ensure the
22 safe and efficient operation of SR1.

23 So if we do have some floods of higher magnitude
24 that are coming down, this can have some implications
25 for operations. And we've heard earlier on, you know,

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1 diversion rates of anywhere from 480 to 600, and when
2 things, you know, exceed 600, then other -- other --
3 other operations are going to have to occur.

4 So that's all that's meant to -- to highlight.

5 Q. Sir, we agree, you're not qualified to speak to dam
6 operations; correct?

7 A. MR. FENNELL: Correct.

8 Q. Sir, on Slide 3, last bullet: (as read)

9 "SR1 does not increase the water
10 security for the City of Calgary as
11 stated by Alberta Transportation."

12 Do you see that, sir?

13 A. MR. FENNELL: I do.

14 Q. Sir, you'd acknowledge that you are not familiar with
15 all the details of the operation of Glenmore Reservoir;
16 correct, sir?

17 A. MR. FENNELL: Not the excruciating details.
18 Only what I've heard through the hearing and what I've
19 read in the documentation.

20 I understand that the level is adjusted
21 accordingly to address any -- any particular events
22 that may be coming at the city.

23 But the point here is that -- and I didn't really
24 understand the logic, and it wasn't very well explained
25 to me as to why it would increase the water security

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Cross-examined by Mr. Barbero

1 for Calgary in a period where water security from a
2 drought situation, which I referred to in my -- later
3 in my slides, that reservoir would be operated very
4 differently; and during an extended drought scenario,
5 the flows would be arguably much lower than what would
6 occur in a flood situation.

7 So SR1 doesn't provide drought -- or water
8 security from an extended drought because it won't be
9 operational because the risk of a flood is lower.

10 Q. Sir, we remain agreed you're not qualified to speak to
11 dam operations?

12 A. MR. FENNELL: We've already covered that.

13 Q. Thank you, sir.

14 Bullet one on page 3 or slide 3, sir, you state
15 that: (as read)

16 "SR1 design has not considered the
17 likely magnitude of floods that have
18 occurred in the past."

19 Do you see that, sir?

20 A. MR. FENNELL: I do, yes.

21 Q. Sir, are you aware the factors of safety have been
22 applied to the SR1 dam design included a 25 percent
23 increase to the diversion channel capacity and over --
24 over what is needed to achieve design base? Do you
25 understand that, sir?

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Cross-examined by Mr. Barbero

1 A. MR. FENNELL: I understand that was in the
2 testimony, correct --

3 Q. Sir --

4 A. MR. FENNELL: -- I will say that that's --
5 let's focus on that 25. What if we have a situation
6 where we're above the 25? I don't believe there's a
7 design consideration for that.

8 Q. We're going to get to that, sir.

9 Sir, are you familiar with the fact that the
10 provincial standard for flood hazard identification
11 program is the 1 in 100-year flood?

12 A. MR. FENNELL: I understand the design flood in
13 Alberta is 1 in 100, that's correct.

14 Q. Sir, you agree that the 2013 flood was larger than a 1
15 in 100-year event?

16 A. MR. FENNELL: The statistics that have been
17 provided indicate that it was in excess of the 1 in 100
18 on the Elbow, yes.

19 Q. All right. So, therefore, sir, you'd agree that SR1
20 exceeds the provincial standard as it is built to be
21 greater than 1 in 100?

22 A. MR. FENNELL: It's built to the 2013 design
23 flooding. Yes, that was above the 1 in 100.

24 What I would like to also say is that the
25 engineering community is certainly reassessing that

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Cross-examined by Mr. Barbero

1 particular design criteria, and we have neighbouring
2 provinces that have adjusted their design floods with
3 climate change in mind.

4 And if you recall, I talked about our neighbouring
5 province of Saskatchewan who has -- who has decided to
6 become fairly cautious and go to the 1 in 500 design
7 flood.

8 And we also have BC to the west of us that is now,
9 you know, brought in the 1 in 200 as their standard.

10 And so we're starting to see the engineering
11 community in Canada change in the paradigm of how we
12 manage floods in our country, and this is taking into
13 consideration climate change.

14 Now, I know that each province is its own
15 jurisdiction as to how they want to address that, but
16 we're starting to see a change, and I think it's a
17 positive change because it is acknowledging that we
18 don't understand everything that could happen in the
19 future, and we need to design accordingly with a --
20 with a -- if you wanted to use the term, a "no regrets"
21 policy.

22 Q. Well, sir, let's deal with that right now.

23 Document host, can I have Exhibit 375, please.
24 PDF page 13, PDF page 13, the paragraph we can focus in
25 on starts with the words: (as read)

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Cross-examined by Mr. Barbero

1 "Some responses have referred to the
2 2013 flood -- "

3 **A. MR. FENNEL:** If it would be possible, document
4 host, if you could increase that a little bit. My
5 aging eyes are -- thank you.

6 **Q.** Sir, this is Annex 1, CEEA IR Round 1, Part 3, it's
7 dated August 21, 2019. Have you reviewed this document
8 prior to giving evidence in this matter?

9 **A. MR. FENNEL:** I haven't. This is the first time
10 I've seen this document.

11 **Q.** Sir, you understand that the federal government has a
12 1 in 100-year standard as well; correct?

13 **A. MR. FENNEL:** Well, you know, I -- what I
14 understand from flood management in Canada is that each
15 province has its own jurisdiction over that.

16 **Q.** Sir, it states here that: (as read)
17 "With a 12 percent increase in peak flow
18 rate by 2050, as estimated from the
19 climate change projections, the
20 project's design flood flow rate of
21 1,240 metres cubed will change to
22 1,389 metres cubed."

23 Do you see that?

24 **A. MR. FENNEL:** Yes, I do.

25 **Q.** Further down, sir: (as read)

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1 "Provisions for climate change are
2 captured in Alberta through factors of
3 safety in engineering design. The
4 project -- being SR1, sir -- includes a
5 25 percent factor of safety in the
6 design diversion rate and a 10 percent
7 increase in the reservoir storage volume
8 from what is needed to meet the
9 project's intended purposes."

10 Do you see that?

11 **A. MR. FENNELL:** **Yes, I do.**

12 **Q.** Thank you, sir.

13 **A. MR. FENNELL:** **I will -- I will say that this**
14 **doesn't take into consideration a flood of higher**
15 **magnitude, which is possible.**

16 **Q.** Document host, can we scroll down, please?

17 Sir, you see the next sentence, "Should climate
18 change increase the frequency." Do you see that?

19 **A. MR. FENNELL:** **Yeah, at the bottom, yes.**

20 **Q.** Yeah, so I think it does, sir, doesn't it? It does
21 include or it does talk about issues with increased
22 frequency?

23 **A. MR. FENNELL:** **It doesn't say to what degree**
24 **though. That's the challenge with that statement.**

25 **Q.** That's okay, sir.

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Cross-examined by Mr. Barbero

1 **A. MR. FENNELL:** **Yeah.**

2 **Q.** Document host, could we return to the PowerPoint,
3 Slide 3, please?

4 Sir, at Slide 3, you state: (as read)

5 "SR1 design has not considered the

6 likely --"

7 **A. MR. FENNELL:** **I'm sorry, I can't -- I can't see**
8 **the slides up on my screen.**

9 **THE CHAIR:** **Just one minute.**

10 Ms. Cundliffe, do you have the right -- do you
11 have the exhibit number?

12 **MS. CUNDLIFFE:** **No, sir. Could they repeat the**
13 **exhibit number they're asking for, please?**

14 **MR. BARBERO:** **Exhibit 384.**

15 **THE CHAIR:** **Thanks, Mr. Barbero. Yeah,**
16 **Slide 3, I think that's correct?**

17 **MR. BARBERO:** **Correct, Mr. Chair. Thank you.**

18 **A. MR. FENNELL:** **There, I see it now.**

19 **Q. MR. BARBERO:** **Dr. Fennell, we've heard a lot**
20 **from Dr. Klepacki and Mr. Dowsett, and now I think it's**
21 **fair to say yourself, sir, that large floods occurring**
22 **on the Bow River during wet periods were not captured**
23 **in the Elbow River records before -- or, sorry, after**
24 **1908. You'd agree with that, sir? That's your**
25 **position?**

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Cross-examined by Mr. Barbero

1 A. MR. FENNELL: They certainly haven't been
2 measured on the Elbow because the period of record
3 isn't long enough. It doesn't extend far enough back
4 in time.

5 Q. Right. Yet, sir, you think they are a relevant
6 consideration?

7 A. MR. FENNELL: Well, certainly there was some
8 events happening in the area at the time, and, you
9 know, from Dr. Klepacki's recent answers to your
10 cross-examination when he was discussing the centroids
11 and the size of these storms, some of these storms can
12 be very large in size and go across basins.

13 So it's not a far stretch to think that flooding
14 could have been occurring on the Elbow at the same time
15 it was occurring on the Bow. We just don't have a
16 documented record of that, and that's what makes these
17 things very difficult.

18 Q. Right.

19 A. MR. FENNELL: And when you don't have a
20 documented record, you can be led to believe that you
21 have actually captured the period of record in your
22 designing with enough safety in mind when,
23 unfortunately, that may not be the case. And under a
24 precautionary principle, you would want to consider the
25 fact that you might not have all the information.

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Cross-examined by Mr. Barbero

1 Q. Well, sir, let's drill down on that a little bit
2 further.

3 So I believe you and Dr. Klepacki have repeatedly
4 pointed to flood events on the Elbow of 1879, 1897, and
5 1902; is that correct, sir?

6 A. MR. FENNELL: There were -- there are no
7 documentations of floods because the records on the
8 Elbow do not go back beyond the early 1900s.

9 So I think what you're referring to is the
10 documented historical floods on the Bow River, the
11 18 -- the late 1800s and the early 1900s.

12 Q. Well, sir, I guess that's my confusion. I had read or
13 understood you and Dr. Klepacki are suggesting that
14 those events should somehow be considered in SR1,
15 right?

16 A. MR. FENNELL: Those events should be recognized
17 as -- as major events that occurred in the region, and
18 from my -- my opinion, need to be considered when
19 you're -- when you're trying to understand the extreme
20 events that could occur. I know they weren't
21 documented on that river; that doesn't necessarily mean
22 that they didn't happen.

23 Q. Right, sir, but you'll recall that Mr. Wood, several
24 times, has suggested that it's not appropriate to -- I
25 think the language he used was to assume that floods

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Cross-examined by Mr. Barbero

1 that occur on the Bow River occurred with the same
2 severity on the Elbow. Do you recall him saying that?

3 **A. MR. FENNELL:** I do -- I do recall him saying
4 that.

5 **Q.** And do you agree with that?

6 **A. MR. FENNELL:** I don't totally agree with that,
7 and the reason why is because this -- if you're just
8 working with the period of record, you can be -- you
9 can be lulled into a false sense of security that
10 you're actually capturing the magnitude of events that
11 can occur. And under more of a precautionary
12 principle, you would probably look to in excess of a
13 25 percent increase. You might want to consider
14 something larger because the possibility is there that
15 it has occurred in the past, and the possibility is
16 certainly there that it could occur in the future.

17 And all this information needs to be pulled
18 together to provide a -- you know, a level of safety
19 that is going to ensure the goals here, which is
20 protecting people and property, all people and
21 property.

22 **Q.** Right, sir, but you need also to have quantifiable
23 information, don't you, sir?

24 **A. MR. FENNELL:** Certainly, but sometimes you need
25 to extrapolate.

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Cross-examined by Mr. Barbero

1 Q. Okay, sir. Well, bear with me then, and let's try to
2 extrapolate.

3 A. MR. FENNELL: And I will certainly say that
4 anything that has to do with flood statistics, to some
5 degree, is extrapolation.

6 Q. Right. So let's try this, sir.

7 You would have heard Dr. Wood -- I'm sorry,
8 Mr. Wood and Dr. Luzi say that, with regards to paleo
9 data, that they are indicative of trends but not
10 necessarily representative of discrete flood events?

11 A. MR. FENNELL: That's correct. And that
12 information was not presented as such to the indicating
13 particular flood events. But it's true that the risk
14 of floods is higher during extended wetter periods than
15 extended drier periods.

16 Q. Right.

17 A. MR. FENNELL: That's just a logical conclusion.

18 Q. Right. And Dr. Luzi and Mr. Wood, you will recall,
19 also said that these tools of paleo data, you know,
20 sir, they do not provide engineers with the flow rates
21 and volumes that are needed to design something like
22 SR1. Do you recall them saying that?

23 A. MR. FENNELL: And I -- yes, I do recall that.
24 And I understand that that limitation and the challenge
25 that -- that the engineering community have with that.

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1 What I'm suggesting is -- is that in order to
2 capture the bookends, to use that vernacular of
3 Mr. Wood, sometimes you need to step out of convention,
4 and that's something that can be difficult because you
5 don't have documented data.

6 And this is why, as a geologist and a
7 geoscientist, we have these -- these paleo records --
8 these paleo records and proxies that we could use to
9 give us an indication of trends, and then we can use
10 our imagination to then give ourselves an idea of what
11 we could expect.

12 It may not be exactly what you can expect, but
13 what you could expect.

14 And I know in the engineering community, the
15 standard practice is to -- to add a factor of safety,
16 but you have to ask yourself, is that factor of safety
17 good enough to address what the bookends could be.

18 Q. All right, sir, well let's talk about that a little
19 further.

20 Sir, there are tools that professional
21 hydrologists use to transpose floods from one watershed
22 where a flow rate was known to a watershed where there
23 is no such data; right, sir, that's what you're talking
24 about?

25 A. MR. FENNELL: Yes.

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1 Q. And you're familiar with some of those methods?

2 A. MR. FENNELL: I'm familiar with them, yes.

3 Q. And we can agree, sir, that they're based on a ratio of
4 drainage area; correct?

5 A. MR. FENNELL: Yes, yeah. They're based on a
6 ratio of drainage area and a number of other factors.

7 Q. And, sir, if I told you that the drainage area for the
8 Bow River has at Calgary 7,870 kilometres square, would
9 you accept that or agree with that, sir?

10 A. MR. FENNELL: Yeah, I -- I agree that's probably
11 about right.

12 Q. And I can tell you, sir, that those numbers came from
13 the Water Survey of Canada publically available data.

14 Sir, if I told you that the drainage area of the
15 Elbow River upstream of Glenmore was 1,190 kilometres
16 squared, would you agree with that?

17 A. MR. FENNELL: Sounds about right.

18 Q. And sir, with reference to your Slide 3 -- I may have
19 that wrong, sir. But anyways, there is a slide, I
20 think it is Slide 3, that shows the estimates of the
21 magnitudes of those flood events on the Bow River.

22 A. MR. FENNELL: Can we go to that slide?

23 THE CHAIR: I think you're on Slide 3 now, am
24 I correct?

25 A. MR. FENNELL: Was it showing the comparison of

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1 **the Bow and the Elbow with the flood events?**

2 Q. MR. BARBERO: Yes, sir, that's the one.

3 A. MR. FENNELL: **I think it -- does it precede this**
4 **or is it after this?**

5 Q. I believe it's Slide 4. Apologies, sir. I get
6 confused between your initial PowerPoint and the
7 revised PowerPoint that went in. Sorry.

8 A. MR. FENNELL: **Yeah, no problem.**

9 Q. As I was saying, sir, though, with reference to this
10 slide --

11 A. MR. FENNELL: **Yes.**

12 Q. -- this shows the estimates of the magnitude of floods,
13 flood events on the Bow River, right?

14 A. MR. FENNELL: **Yeah, I believe the Bow is on the**
15 **left-hand side, and the Elbow is on the right-hand**
16 **side.**

17 Q. Right.

18 A. MR. FENNELL: **If we could bump that up a little**
19 **bit more, that would be very much appreciated.**

20 Q. And, in fact, if we could focus in on the left-hand
21 side on the gate 1897. I'm most interested in that
22 one.

23 A. MR. FENNELL: **Okay.**

24 Q. So, sir, looking at this 1897, you would agree with me,
25 sir, that based on your slide here, the flood peaked at

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1 2,265 metres cubed per second. Do you see that?

2 **A. MR. FENNEL:** **I do see that, yes.**

3 **Q.** And that's your number right, sir, from wherever you
4 got this document?

5 **A. MR. FENNEL:** **This is, yeah, from the City of**
6 **Calgary. This was from their website. I found these.**
7 **I know that there's been a lot of different graphs**
8 **flying around over the last few days and months, but**
9 **this is what I -- I had at hand --**

10 **Q.** Now, sir --

11 **A. MR. FENNEL:** **-- for comparative purposes.**

12 **Q.** Now, sir, if I told you that using a direct ratio, the
13 flow of the Elbow River in 1897 would be estimated to
14 be 342 metres cubed per second, extrapolating from the
15 numbers we just looked at here, would you -- would you
16 agree with that, sir?

17 **A. MR. FENNEL:** **If you're just doing the straight**
18 **math, that would be correct; but, you know, there's**
19 **other factors that could come into play here.**

20 **Q.** Of course, sir, of course. But if we're just staying
21 with that number, sir, 342 metres cubed per second for
22 the 1897 event on the Elbow, you'd agree with me -- and
23 I'm taking this, sir, from the Golder report that
24 Dr. Klepacki submitted -- you'd agree with me that that
25 rate is approximately a 1 in 20-year flood, isn't it,

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1 sir?

2 **A. MR. FENNEL:** If you say so. I haven't done the
3 actual calculations, so I'll have to agree there.

4 **Q.** Very good, sir, thank you.

5 Sir, are you aware that, with regards to
6 Exhibit 235 -- and we don't have to turn it up, it's a
7 broad question, sir -- but are you aware that Golder
8 performed a flood frequency analysis that adjusted peak
9 flows utilizing the same pre-gauge history from the
10 Bow River floods that you, Mr. Dowsett, and
11 Mr. Klepacki have mentioned? Did you know that, sir?

12 **A. MR. FENNEL:** No, I'm not aware of that.

13 **Q.** Sir, could we -- I'm sorry, document host, could we
14 bring up Slide 7, please?

15 Dr. Fennell, sir, what are we looking at on the
16 table on the left?

17 **A. MR. FENNEL:** On the graph? That is a chart
18 showing the projected change in precipitation from the
19 1975 to to 2005 baseline under two different climate
20 change scenarios: One being the RCP 4.5, which is
21 shown in grey, and the other in RCP 8.5 which is
22 showing in red.

23 It's showing that change from the baseline with
24 the values or the lines that follow above the dotted
25 line, which is at zero percent change from baseline,

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1 being an increase, and the -- the lines falling below
2 the line being a decrease.

3 Q. Sir, yesterday you described RCP 8.5 as the, quote,
4 "worst-case scenario." Do you recall that?

5 A. MR. FENNELL: Yeah, it's the scenario where
6 there is no -- no mitigation to -- to greenhouse gas
7 emissions or global warming. So it is what is
8 considered to be the worst-case scenario.

9 Q. And, sir, it's difficult to see on this table or graph,
10 but I'm going to put it to you, sir, that, in May and
11 June, under the RCP 8.5 condition, the projected
12 increases are, call it, 6 percent for June and maybe
13 12 percent for May? Would you -- would you have any
14 reason to disagree with that?

15 A. MR. FENNELL: No, I wouldn't disagree with that,
16 and I would also point that the changes are -- the
17 maximum changes are occurring earlier in the year in
18 around April, which is consistent with the projections
19 for how the shortening of the winter season will occur.

20 And so what we're seeing is, we're seeing a shift
21 in when that precipitation is being received. That's
22 the point here is that we're seeing a shift.

23 We're seeing a compression of the amount of
24 moisture that's received in the -- in the late winter,
25 early spring season that is, you know, projecting to

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1 **increase stream flows more so than they are today.**

2 MR. BARBERO: Mr. Chair? Mr. Chair?

3 THE CHAIR: Yes, Mr. Barbero. Sorry, a little
4 slow on the mute.

5 MR. BARBERO: Sir, I just wanted to ask you if
6 you had any views on when to take the morning break as
7 I'm at a good point in my notes to do that now if it
8 was convenient, sir.

9 THE CHAIR: That works, actually. Thank you,
10 Mr. Barbero.

11 MR. BARBERO: Thank you, sir.

12 THE CHAIR: So let's break till 10:30 then,
13 thank you.

14 (ADJOURNMENT)

15 MR. BARBERO: Mr. Chair, thank you, sir, and
16 before I start, just to alert you, sir, I might be
17 another 45 minutes, I think?

18 THE CHAIR: Yeah, okay. Thank you.

19 MR. BARBERO: Thank you, sir.

20 Q. Dr. Fennell, thank you, sir, I think before we broke,
21 you were discussing Figure 13 at Slide 7, which was a
22 chart, or a table, I suppose, more accurately.

23 A. MR. FENNELL: Yeah.

24 Q. And, sorry, sir, it's been a long couple of days, just
25 remind me if you could, what is that figure speaking

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1 to? In particular, you were make comment about the
2 April/May period.

3 A. MR. FENNEL: Okay. So that figure is speaking
4 to the change in the precipitation as projected from
5 the baseline under two different climate scenarios, RCP
6 4.5, and RCP 8.5.

7 And we showed a dotted line at zero, which was
8 indicating -- you know, anything above that line is
9 above average -- or, sorry, above the baseline, period,
10 anything below is less than or -- or a decrease in
11 precipitation.

12 And so what it was showing is that, you know,
13 upwards of about an increase of 30 percent or so
14 occurring more so in the earlier in the year around the
15 April/May period than the May/June period, and that's a
16 function of the shifting of the -- of the winter season
17 to -- to a more protracted situation.

18 Q. Sir, you'll recall that I put a paper to Dr. Klepacki
19 during his cross-examination. I put it to him in
20 relation to whether or not he was aware of it.

21 A. MR. FENNEL: Yes.

22 Q. Document host, if we could bring that up. That's
23 Exhibit 388.

24 And, sir, while we're waiting for that to come up,
25 I'd just like to ask you whether or not you were

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1 provided with that aid to cross in advance of today?

2 **A. MR. FENNEL:** Yes, I think it came in quite late
3 on -- on Sunday evening, but I did have a chance to
4 have a quick -- I mean, a quick review, it's a fairly
5 large document on Monday morning, and then, of course,
6 I haven't had a chance to go through it in excruciating
7 detail, but I have gone through it.

8 **Q.** Sir, I don't believe you referenced this paper in your
9 report; is that correct?

10 **A. MR. FENNEL:** No, because it was not provided to
11 us at the time.

12 **Q.** And in your own study or experience, you'd not come
13 across it?

14 **A. MR. FENNEL:** No.

15 **Q.** No. Document host, could we go to PDF page 86, please?

16 **A. MR. FENNEL:** And if we could bump that up a
17 bit, that would be great, thank you.

18 **Q.** I'm most interested in -- well, I guess, technically,
19 first full paragraph, but what appears to be the second
20 paragraph, "A novel way..." and, sir, why don't you
21 take a moment to just to review that paragraph, if you
22 wouldn't mind.

23 **A. MR. FENNEL:** Sure. Okay.

24 **Q.** And, sir, the reason I brought you here was something
25 that you said just for the break, and I hope I haven't

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1 misunderstood it, but I think you were talking about
2 those increases, or projected increases, in March and
3 April as being important because of the interplay
4 between rain and snow. Did I hear that right?

5 **A. MR. FENNEL:** What that chart was referring to
6 was precipitation. I would imagine that includes both
7 rain and snow because both are precipitation.

8 **Q.** And, sir, I guess, this last sentence: (as read)
9 "Increased rainfall-runoff was unable to
10 compensate for reductions in snow-based
11 runoff processes for this flood event."

12 That would sort of be at odds with what you were
13 suggesting might happen in an April or March time frame
14 based on that earlier chart, or am I wrong on that? Are
15 we talking about the same processes?

16 **A. MR. FENNEL:** I think this is -- this is talking
17 about the interplay between rain and snow, and,
18 obviously, that's a complex interrelationship. It's
19 certainly a function of the temperature and the
20 moisture conditions, all of that kind of stuff, the
21 warmth of the rain -- there's a lot of things that come
22 into this, so I'd have to delve into this a little bit
23 more to understand exactly what they're saying here,
24 and the -- and the sequence of events that led to this.

25 **Q.** Sir, it might be on my end, I just -- when you were

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1 talking before the break I thought this twigged.

2 But, document host, we can take this down.

3 If we could return to Dr. Fennell's PowerPoint,
4 Exhibit 384, Slide 9, please.

5 Sir, this slide is entitled, "Risks Posed by
6 Prolonged Drought." And I'm not clear, are you
7 suggesting that these are risks associated with SR1 or
8 are these risks with drought generally?

9 **A. MR. FENNELL:** Well, these -- these risks are in
10 the context of the SR1 project, and so when you look at
11 the, you know, the risks that have been identified,
12 they're in particular reference to the SR1.

13 **Q.** So, sir, just so that I'm clear, you're saying that, in
14 prolonged drought circumstances, these risks you
15 anticipate to occur at the SR1 site or be associated
16 with the SR1 site?

17 **A. MR. FENNELL:** They would be associated with the
18 project. So they're obviously occurring in different
19 places.

20 If you talk about, for example, the windblown
21 dust, that would be a function of the dust being blown
22 out from the sediment accumulated in the reservoir
23 itself when it's dry.

24 Certainly, algal blooms and insects, any residual
25 water that may be in the SR1 at any given time, whether

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1 it's left over from the capture of flood and release of
2 the water, and some of the water -- the residual water
3 being left behind, because it doesn't completely drain
4 from what I understand, there is a little bit left
5 behind because of the way the outlet is designed, it
6 sticks up a bit so sediment isn't pulled directly in,
7 so there's going to be some water left behind. So,
8 that -- you know, that plus some nutrients and some
9 warming could lead to development of some algal blooms.

10 Ground cracking, obviously, if you have something
11 that's been wet and dries out, it can crack; if the
12 water table drops beneath the SR1 reservoir footprint,
13 you could have cracking.

14 And, certainly, the wild fire is something that
15 would be happening up -- upstream of the SR1 itself,
16 but that has ramifications for the types of peak flows
17 that one could experience.

18 So when you have a -- you know, a large burn area,
19 that changes the run-off characteristics of that area,
20 so you could get more -- higher yields coming out of
21 those areas because there's less retention, there's
22 hydrophobic soils that don't accept the water in now,
23 and so you get -- your run-off coefficients change,
24 which will effect your peak flows. And so that's
25 important to keep in mind, that the peak flows can

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1 be -- can be adversely affected by having these types
2 of large -- large fires.

3 Q. Sir, you agreed with me earlier, you're not an expert
4 in air quality, are you, sir?

5 A. MR. FENNEL: No, I'm not an expert in air
6 quality, but I am familiar with, you know, the concepts
7 of PM 2.5 and the health implications that they can
8 have -- I've been through enough oil sands hearings to
9 listen to the experts talking to understand what the
10 ramifications of these things are.

11 Q. Right. Okay, sir.

12 A. MR. FENNEL: But I'm not an expert -- I'm not
13 an expert in that. But I don't think breathing fine
14 dust is -- is healthy.

15 Q. Sir, I'd like to take you to Slide 13.

16 If I understand correctly, sir, on Slide 13 of
17 your presentation, you're stating that only three
18 hydraulic conductivity field tests were completed; is
19 that correct?

20 A. MR. FENNEL: That's correct.

21 Q. Document host, could we have Exhibit 175, page 102,
22 please. And, again, that was page 102, specifically
23 Table 12. If you can zoom in, please, document host.

24 Sir, Table 12, it's entitled "Summary of CPT Pore
25 Pressure Dissipation Tests." Do you see that?

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1 **A. MR. FENNEL:** I do see that, yeah.

2 **Q.** Sir, are you able to tell me, are CPT pore pressure
3 dissipation tests field tests or are they lab tests?

4 **A. MR. FENNEL:** I believe those are done in the
5 field. It's a cone penetration test, but I think
6 it's -- what's important, there's an important
7 distinction that needs to be made here.

8 A CPT test is very different than the types of
9 tests that I'm referring to. A hydraulic conductivity
10 test that is done in a -- in a monitoring well where an
11 amount of water is evacuated or -- and the water level
12 is allowed to recover is giving you a very good
13 indication of what the local hydraulic conductivity is
14 of the materials.

15 As far as a cone penetrometer test, you're getting
16 different information than what you would get from a
17 field test doing a drawdown test in a monitoring well.

18 So you're comparing apples and oranges in this
19 case.

20 **Q.** Go to the PowerPoint presentation, Exhibit 384 and
21 Slide 14, please.

22 **A. MR. FENNEL:** It's also important to understand
23 that when you're doing a CPT test, you're testing a
24 very small interval of the sediment, but with a
25 hydraulic conductivity test, you're grabbing a lot more

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1 of the formation, so you're getting a better idea of
2 what that formation is able to yield, as opposed to a
3 point measurement. So it's more of a vertical
4 averaging, so you're getting a much better
5 representation.

6 Q. Right, sir. We're going to come back to that in a
7 moment.

8 On Slide 14 here, sir, can you describe for me
9 what you mean by the statement in the lower left-hand
10 side of the slide where it says: (as read)

11 "No sand and gravel was added for the
12 Unnamed Creek."

13 A. MR. FENNEL: Sure. So what I meant there is,
14 in the previous slides, it did indicate in some of the
15 other exhibits and statements were made acknowledging
16 the presence of a -- of sand and gravel deposit in the
17 Unnamed Creek valley that -- that ranged from 1 to
18 7 metres thick. So that -- that's a fairly significant
19 finding.

20 The problem here is that it's not explicitly shown
21 in the model there. So it's not accommodated in the
22 model there. So that is something that's missing.

23 If a feature like that, which is -- is, arguably,
24 a permeable feature that could convey groundwater, is
25 not included in a model layer, then that model layer is

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1 not complete.

2 And so this is what this statement means is that
3 no sand and gravel was added to address that deposit
4 that's been acknowledged by Alberta Transportation
5 existing in the Unnamed Creek valley.

6 And so that leads to a concern regarding how the
7 groundwater pathways have been dealt with in the model
8 itself.

9 Q. Zoom host, could I have Exhibit 110, PDF page 39,
10 please. PDF 39. Thank you.

11 Sir, this is Figure 3-6 entitled "Isopach Map of
12 the Basal Silt, Sand and Gravel." Do you see that,
13 sir?

14 A. MR. FENNEL: I certainly do, yes.

15 Q. Yes. You'd agree, sir, that this figure, which comes
16 from the geological model of the area, indicates that
17 this unit can be found in the area of the Unnamed
18 Creek. Do you see that, sir?

19 A. MR. FENNEL: I think this is where the
20 confusion occurred in -- in yesterday's
21 cross-examination.

22 This is the basal sand. This is the sand that's
23 sitting on top of the bedrock, which is down anywhere
24 from, you know -- it's deeper down in the section.
25 This is -- this is probably in Layer 4 or 5.

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1 The sand and gravel that I'm referring to is the
2 one that's acknowledged by Alberta Transportation as
3 being in the Unnamed Creek valley close to surface and
4 covered by a thin veneer of glacial material.

5 This is deep down in the section. I'm not arguing
6 that this has been accommodated in the model; this has
7 absolutely been accommodated in the model. The
8 shallower sand has not. And that's a concern,
9 certainly with respect to pathways that would be
10 occurring underneath the earthen damn itself, how the
11 water's going to be moving underneath the -- the
12 footprint of the reservoir itself, how water is going
13 to leak through the base of the structure when it's
14 full into that sand and where that sand is -- is going
15 to take that water, that's what I'm talking about.

16 That is not explicitly identified in Layer 1 or 2
17 of the model. If you want to go back to those figures
18 and convince yourself, we can do that again.

19 Q. Actually, let's go back to Slide 14 if we can.

20 A. MR. FENNELL: You need to recognize that a
21 deposit like a sand and gravel deposit is -- is going
22 to be a linear feature, like something that's in a
23 channel.

24 And so what I would have expected to see is some
25 sort of a linear feature running roughly consistent

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1 with where the Unnamed Creek would have been running
2 underneath the footprint of the reservoir.

3 Q. Right.

4 A. MR. FENNELL: And that's not apparent.

5 Q. Okay, but back to Slide 14, sir. You've highlighted
6 two conductivities, I think they are, in the upper left
7 corner?

8 A. MR. FENNELL: Yeah.

9 Q. Why did you do that?

10 A. MR. FENNELL: The point of that is that -- and
11 you'll also see in there that I've identified where the
12 clay is and where the till is. So the clay is
13 identified in more the purple colour, and the till is
14 identified in the -- in the more the turquoise colour.

15 And so there was confusion as to how the model
16 layer has been attributed with a hydraulic
17 conductivity. So if we know that the clay is the
18 purple area, and the purple in the legend -- or to the
19 left, is showing 7.2 times 10 to the minus 8 metres per
20 second, when you actually go back to the previous slide
21 that shows the model layers and how the hydraulic
22 conductivity is attributed, that purple should be 5.1
23 times 10 to the minus 6, according to that table.

24 So there's a discrepancy. I think they might have
25 got the numbers switched.

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1 Q. Dr. Fennell, might I suggest that the confusion is in
2 the slide? Have you confused the clay and the till?

3 A. MR. FENNELL: No. If you could go back maybe a
4 slide or two.

5 Q. Zoom host --

6 A. MR. FENNELL: Yeah, one more back. Keep going.
7 There we go.

8 So this is Slide 11 I see. Okay. So this is
9 showing the map where the clay deposits are -- the
10 glacial lacustrine clay. So the image on the left is
11 the isopach. So that's basically the thickness. But
12 it's showing where that clay is. Those blue lines are
13 showing that it runs roughly through the centre of the
14 reservoir footprint, and it could be upwards of
15 5 metres thick, so it ranges in thickness.

16 The image on the right-hand side is showing a side
17 view looking basically from east to west, and you can
18 roughly see where the outline of the reservoir
19 footprint is as well as the diversion channel.

20 The swath of brown material that's running through
21 the middle of the reservoir footprint is clay. So it's
22 showing that that's -- that's the -- that's where the
23 clay is. That's the purple area that's shown in
24 Layer 1 of the model.

25 Q. Let's try it a different way, sir.

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1 Zoom host, can I have Exhibit 375. Zoom host, my
2 apologies, don't lose this document, but I'm wondering
3 if we could just take one step back and go to Slide 14.
4 Actually, no, my apologies, the other slide we were
5 looking at a moment ago.

6 **A. MR. FENNELL: Slide 11?**

7 Q. Slide 11.

8 **A. MR. FENNELL: Yeah.**

9 Q. Sir, did you create this image based on something in
10 the filed material?

11 **A. MR. FENNELL: Absolutely not. You can see it's**
12 **from Exhibit 110, PDF page 47 and Exhibit 110, PDF**
13 **page 50.**

14 Q. And you extracted it yourself, sir, and inserted it
15 here?

16 **A. MR. FENNELL: Yes. Hasn't been altered. This**
17 **is -- this is.**

18 Q. Oh, no, sir. I, by no means, am implying that anything
19 was altered, sir; not at all. I was just wondering if
20 there might have been an error in transposition or
21 something.

22 **A. MR. FENNELL: No, no. I mean we could go to**
23 **Exhibit 110 and verify.**

24 Q. No.

25 MR. BARBERO: If I could just have a moment,

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1 sir, or Mr. Chair?

2 THE CHAIR: Yes. Please proceed.

3 MR. BARBERO: Mr. Chair, thank you for that,
4 sir.

5 Q. Dr. Fennell, I do apologize. I'm just -- I'm getting
6 quite confused here.

7 So if you look at the image, Slide 11 on the
8 right, so the one that's green and brown.

9 A. MR. FENNELL: Correct.

10 Q. I want you to keep that image in your mind's eye
11 because I don't think it's accurate when we look at
12 Slide 14. And I'm going to ask that, sir, I want you
13 to tell me, is what you're representing at Slide 11 on
14 the right side, side view of deposit --

15 A. MR. FENNELL: Yeah.

16 Q. -- accurately reflected in the image on Slide 14 that
17 you've coloured?

18 A. MR. FENNELL: It appears to be.

19 Q. Are you sure?

20 MR. SECORD: Just to -- just -- Richard Secord
21 here.

22 Just a clarification, Mr. Barbero. You're saying
23 that Dr. Fennell coloured the slides on PDF page 14?

24 MR. BARBERO: No, no, I'm saying he labelled
25 them "clay" and "till."

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Barbero

1 MR. SECORD: Yeah. You used the word that he
2 "coloured."

3 MR. BARBERO: Apologies.

4 MR. SECORD: Just to be clear, these slides
5 have been coloured by AT.

6 MR. BARBERO: Yes, yes, but not labelled. I
7 guess that's where I'm getting confused.

8 Q. MR. BARBERO: Right, Dr. Fennell, I'm right.
9 You added the words "clay" and "till"?

10 A. MR. FENNEL: **I added the clay and the till,**
11 **yes.**

12 Q. Right. So sir, having regard to the image on Slide 11
13 and having regards to the image on the upper left
14 corner of Slide 14, is there any discrepancy there,
15 sir?

16 A. MR. FENNEL: **Not that I can see.**

17 Q. Right. Hmm. Okay, sir, apologies for taking you down
18 that tangent. It must be my misunderstanding.

19 Sir, can I take you to Slide 17 of your
20 PowerPoint?

21 Sir, do you have Slide 17 in front of you there?

22 A. MR. FENNEL: **Yes, I do.**

23 Q. Sir, I can't find anywhere in your report calculations
24 regarding the seepage rate estimate of a hundred
25 thousand metres. Did you prepare calculations?

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Barbero

1 A. MR. FENNELL: I did a calculation, yes, in my --
2 in my submission that -- that the leakage would likely
3 be orders of magnitude higher, and that's based on the
4 fact that the hydraulic conductivity that's -- that's
5 been used in the model is lower than it should be.

6 Q. Yes, but those calculations are not in your report, are
7 they?

8 A. MR. FENNELL: No, they're not.

9 Q. Sir, going to Slide 20 of your presentation, you
10 highlight two model simulation results; correct?

11 A. MR. FENNELL: Yes. These were selected as
12 examples.

13 Q. And, sir, what model is this?

14 A. MR. FENNELL: I -- I believe this is the
15 modelling that the geotechnical team did to understand
16 changes in pore pressures and failure modes.

17 I don't -- I'm not familiar with the models; I'm
18 just working off the information that's provided.

19 Q. I see. So you've titled it "Geotechnical Concerns",
20 and it looks like a geotechnical diagram to me. Are we
21 agreed, sir, it's a geotechnical diagram?

22 A. MR. FENNELL: These are geotechnical diagrams
23 that were prepared by Alberta Transportation.

24 The context here is with respect to pore pressures
25 and how pore pressures change when a loading is placed

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Barbero

1 on the landscape.

2 Q. Right.

3 A. MR. FENNEL: That's just basic knowledge in
4 hydrogeology is the total stress is affected stress
5 plus pore pressure. So...

6 Q. But you've also --

7 A. MR. FENNEL: The meaning of this slide is to
8 point out that things do change, and that -- and that
9 things can have failures, and it speaks to whether or
10 not there has been sufficient enough testing of the
11 sediments at particular higher risk intervals to
12 identify whether or not that risk exists.

13 Q. Right. And you have some text below. Do you see the
14 text below, sir?

15 A. MR. FENNEL: Yes, I do.

16 Q. Right.

17 A. MR. FENNEL: I highlighted that because, I
18 think, as the text says: (as read)

19 "In addition, effects on pore pressures
20 were in fact examined under the most
21 conservative scenario, where the
22 complete external loading due to the
23 'weight of the water' impounded in the
24 reservoir was applied directly to the
25 underlying bedrock, assuming that none

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Cross-examined by Mr. Barbero

1 of this external load would be borne by
2 the overlying clays/tills."

3 The point of putting that statement there was to -- was
4 to indicate that the assessment was being done down in
5 the bedrock while -- and that's important, too, to
6 understand if there's going to be failures in weak areas
7 of the bedrock deposits, mud stones, and things of that
8 nature. But it does not look like this was applied to
9 the shallower intervals, the glacial, lacustrine
10 material, and the tills, and the interface between
11 these.

12 And so I guess, in cross-examination yesterday,
13 Mr. Back was -- was explaining what had been done is --
14 with respect to the testing of the sediments, but it
15 does not appear that the interfaces between these had
16 been tested explicitly.

17 And so these can represent higher risk horizons
18 because you have different types of deposits on top of
19 each other, and that can be a plane of weakness. And
20 when pore pressures build up, that can -- that can
21 increase that risk of shear slip, and so that did not
22 appear to be explicitly looked at.

23 The other aspect of this is that some of these
24 soils have a notable content of what's called
25 montmorillonite clay. So this is a smectite clay, this

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Cross-examined by Mr. Barbero

1 is a swelling clay, and when it hydrates, it loses its
2 cohesion, and you could get slippage.

3 And so it just seemed to me that this might be
4 something that possibly got missed. And so this is why
5 I pointed it out. I'm not a geotechnical engineer, I'm
6 just trying to point out, you know, areas that we need
7 to perhaps consider.

8 Q. Sir, you -- you understand that the figures on the top
9 do not relate to the text on the bottom?

10 A. MR. FENNELL: The figure on the top is
11 indicating the change in pore pressure that would be
12 expected when the dam has been built.

13 And as you can see, there's a pore pressure
14 buildup underneath the dam itself. Not so much
15 underneath the area in the -- in the black hatching,
16 which is the reservoir when it's full, and -- and the
17 weight of the water. So that's -- that is showing
18 that, you know, Alberta Transportation has modelled
19 that pore pressures will change.

20 What I didn't completely understand on that
21 diagram is that we're showing -- in the -- in the
22 legend -- if we could just bump that up a bit in
23 magnification, document host, thank you. Thank you,
24 that's good.

25 So we see water pressure in the legend on the --

SCLG TOPIC #4 PANEL

Cross-examined by Mr. Barbero

1 on the right-hand side. If we look on the -- the
2 right-hand side of the dam itself, the area that -- in
3 the top image, it's an area in blue, and you see the --
4 just underneath the black hatching, the left side of
5 the -- of the toe berm on the dam itself, you see a
6 pore pressure of anywhere from 0 to 20 kPa, that's that
7 blue colour. I think it's 0 to 20 or 20 to 40.

8 What I find very interesting with this -- and I
9 didn't quite understand it, maybe it could -- be
10 explained to me at some point -- but we have a head of
11 about 20 to 24 metres of water, and so every metre of
12 water is roughly about 10 kPa. So 24 metres of water
13 would be 240 kPa, and that's not being reflected in
14 this image. So that's something I don't understand,
15 and maybe it could be explained to me.

16 So -- but certainly underneath the dam itself, you
17 can see the pore pressures increasing upwards of 200 to
18 maybe 240 kPa.

19 Q. Sir, did you prepare this slide deck yourself?

20 A. MR. FENNELL: I did.

21 Q. And did you include the highlighting on the text at the
22 bottom, sir?

23 A. MR. FENNELL: Yes.

24 Q. And, sir, you understand that Exhibit 178 are
25 geotechnical diagrams, and I put it to you, sir, that

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Cross-examined by Mr. Barbero

1 the text below is not in any way related to the
2 geotechnical, but that is from the groundwater
3 modelling, sir.

4 A. MR. FENNEL: That's fine. We're talking about
5 pore pressures.

6 Q. Right, but --

7 A. MR. FENNEL: Whether it's -- whether it's a
8 geotechnical application or hydrogeological
9 application, pore pressure is pore pressure.

10 Q. Well, sir --

11 A. MR. FENNEL: The (crosstalk) -- there shouldn't
12 be.

13 Q. Right. Well, you understand that the approach to
14 examining the effect of external loads on pressure in
15 the bedrock aquifer has nothing to do with the
16 geotechnical models depicted in this slide; correct?

17 A. MR. FENNEL: Well, this is where I was confused
18 because we have the internal load of the weight of the
19 water being impounded, placing that on the underlying
20 bedrock, I don't understand how that addresses what's
21 going on in the more -- in the clay and the tills.

22 Q. Okay, sir.

23 A. MR. FENNEL: So -- and one of the -- one of
24 the -- one of the comments that I believe I might have
25 made in my submission is that it would have been useful

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Cross-examined by Mr. Barbero

1 to have been provided with some -- some -- some
2 information from the groundwater model that would show
3 how the pore pressures would change in some simulated
4 hydrographs, how would those pore pressures adjust in
5 time, and that was not provided.

6 And, as well, nothing was provided under the
7 sensitivity analysis which would have been very useful
8 to have -- to do some more verification.

9 So these types of things would have been helpful,
10 that's all I'm saying.

11 Q. Thank you, sir. That's interesting --

12 A. MR. FENNEL: I'm glad it's interesting, but
13 it's a fact.

14 Q. Yes, thank you. Mr. Chair, I'm mindful of the time, so
15 I'm going to pick up the pace here, sir.

16 Can we quickly go to Slide 23.

17 Sir, at Slide 23, you write: (as read)

18 "MC1 is a superior option given its
19 ability to manage higher magnitude
20 floods (up to the PMF)."

21 Do you see that?

22 A. MR. FENNEL: I do.

23 Q. Yeah. Who has provided -- or where, sir, is the source
24 for that claim that MC1 can manage a PMF?

25 A. MR. FENNEL: That has been communicated

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Cross-examined by Mr. Barbero

1 throughout this -- these proceedings.

2 Q. Right, sir. So what is the source --

3 A. MR. FENNELL: It is designed to address the PMF.

4 Q. Right, sir. So what is the source that you relied on
5 for that?

6 A. MR. FENNELL: I've relied on -- I looked at the
7 Opus reports, I've looked at the documents that have
8 been provided, I've come to that -- I've come to
9 that -- that's my opinion, that it is a superior
10 option.

11 And it's not just with respect to addressing
12 higher magnitude flood, which is likely to occur in the
13 future given what we've been talking about, it does
14 protect all downstream communities, not just downstream
15 of the Glenmore Dam.

16 It also has the ability to store water. It holds
17 3500 dam cubed at any given time, and it has the
18 ability to store more water.

19 So if you really want water security for the city
20 of Calgary, that provides a much better option because
21 SR1 is not designed to contain water currently or for
22 long periods of time.

23 And so, to me, that's why I use the word
24 "superior," but that's my opinion.

25 Q. And so you will agree that, at no place in your report

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Cross-examined by Mr. Barbero

1 filed at Exhibit 261, have you carried out a technical
2 or detailed assessment of MC1?

3 A. MR. FENNEL: No, I haven't. Other people have
4 done that, and I've read their materials, and I've
5 taken it at face value. And this is the materials that
6 have been submitted by Alberta Transportation
7 throughout this whole journey.

8 Q. Mr. Chair, if I could have one moment to review my
9 notes, I may be done.

10 THE CHAIR: Yes, please. Take a few minutes.

11 MR. BARBERO: Thank you, Mr. Chair.

12 Mr. Chair?

13 THE CHAIR: Yes.

14 MR. BARBERO: One more question, if I may.

15 THE CHAIR: Yes, please.

16 Q. MR. BARBERO: Zoom host, if I could have
17 Exhibit 375, please, PDF page 48. If we can zoom in a
18 bit more, please. A bit further. A bit more, please.
19 And if we could centre that image such that the legend
20 is in view, as well, thank you.

21 So sir, what we're looking at here is Exhibit 375,
22 PDF page 48, Figure 17-1.

23 Sir, would you agree that this figure presents
24 hydraulic conductivity values assigned in the upper
25 layer of the model?

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Cross-examined by Mr. Barbero

1 And if you need to see the title, sir, please just
2 advise the Zoom host.

3 **A. MR. FENNEL:** **Yeah, if we can just verify that**
4 **that's layer one.**

5 MR. SECORD: Yeah, I -- Richard.

6 MR. BARBERO: Mr. Secord's been using this
7 document a fair amount, I believe.

8 THE CHAIR: Mr. Secord, you were weighing in?

9 MR. SECORD: Yeah.

10 MR. BARBERO: Mr. Secord, sir, you seem to be
11 cutting out.

12 THE CHAIR: Yes.

13 **A. MR. FENNEL:** **Is there -- is there a title**
14 **below?**

15 THE CHAIR: Mr. Secord, I think he's trying to
16 speak. He's on mute right now. Let's just him weigh
17 in. Mr. Secord, were you trying to address?

18 Looks like he's frozen.

19 **A. MR. FENNEL:** **Well, I can't verify if this is**
20 **layer 1 or layer 2 or layer 3.**

21 Q. MR. BARBERO: We'll just wait for your counsel
22 Mr. -- or Dr. Fennell.

23 THE CHAIR: Mr. Wiebe, is he -- does it appear
24 that he's still online?

25 MR. WIEBE: Yeah, it appears that he's still

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Cross-examined by Mr. Barbero

1 online. I have him pinned up right now. So if he can
2 hear us, I would just suggest that he stops his video
3 and restarts it.

4 THE CHAIR: Perhaps, Mr. Kennedy or Ms. Vance,
5 you could give him a call if he has his cell just to
6 see if he's able to reconnect. We may have to break.

7 MR. KENNEDY: I'll give him a call.

8 THE CHAIR: Thank you.

9 **A. MR. FENNELL:** **Maybe in the meantime, if we could**
10 **scroll back to show the legend, and I can just have a**
11 **look at the...**

12 THE CHAIR: Yeah, it looks like Mr. Secord may
13 have been dropped. He maybe tried to re-sign back in.
14 Mr. Barbero, maybe it would be a good idea to wait
15 if we can for a couple of minutes.

16 MR. BARBERO: Yes, Mr. Chair.

17 THE CHAIR: Thank you.

18 MR. WIEBE: And I'll let him in immediately
19 when I see him.

20 THE CHAIR: Thank you.

21 MS. FRIEND: Excuse me, Mr. Chair. This is
22 Laura.

23 THE CHAIR: Yes?

24 MS. FRIEND: Excuse me, Mr. Chair. This is
25 Laura. Mr. Secord just phoned me, that he got dropped

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Cross-examined by Mr. Barbero

1 out, and he's trying to reconnect, to get back into the
2 hearing.

3 THE CHAIR: Okay. Thank you, Ms. Friend.

4 Well, we haven't had a lot of glitches, so if this is
5 the first one on day 8, that's not too bad.

6 Spring break. Perhaps bandwidth is being used up
7 by gamers.

8 Do we have just a phone-in option only, Mr. Wiebe?

9 MR. WIEBE: Yes, there is that available as
10 well. I won't be able to spotlight him, though --

11 THE CHAIR: That'll still work though, get us
12 by for now.

13 Perhaps if we forward him, Mr. Friend, or whoever
14 has that number, if we can get Ms. Friend or
15 Mr. Kennedy to give to Mr. Secord.

16 MR. WIEBE: Yeah, I'll get it to her right
17 now.

18 MR. KENNEDY: I'm going to suggest it might be
19 important for him to --

20 MR. WIEBE: Oh, I think we hear him.

21 THE CHAIR: Yeah, we'd like to wait,
22 Mr. Kennedy. I would agree? Mr. Secord.

23 MR. SECORD: So can you hear me now?

24 THE CHAIR: Yeah, we can, but if you could
25 just speak up a bit, that would be great.

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Cross-examined by Mr. Barbero

1 MR. SECORD: Great. So I don't know what
2 happened there, but I just -- I just wanted to see the
3 bottom of the slide, that was all.

4 MR. BARBERO: Mr. Chair, maybe I could try to
5 reorientate us and ask the question?

6 THE CHAIR: Yes. Thank you, Mr. Barbero.

7 Q. MR. BARBERO: So, sir, I've brought you to this
8 Exhibit 375, page 48, Figure 17-1, which I understand,
9 sir, is a figure that presents the hydraulic
10 conductivity values assigned in the upper layer of the
11 model.

12 If you wanted to, sir, I could take you to PDF
13 page 46 where there's a bit more of a discussion about
14 the figure, but I'm in your hands, Dr. Fennell.

15 A. MR. FENNELL: Yeah, I mean it's -- I'd like to
16 confirm that that is Layer 1.

17 Q. So if you see at the first bullet there, and the second
18 and third bullets. So 17-1, it's identified in the
19 second bullet, sir, as the initial and final calibrated
20 horizontal and vertical hydraulic conductivities. Do
21 you see that?

22 A. MR. FENNELL: Yeah, it doesn't identify a layer,
23 though. I don't know what layer that is. Is it -- is
24 there some way of verifying that that figure that you
25 showed is Layer 1 of the model?

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Cross-examined by Mr. Barbero

1 Q. Well, sir, you have me at a disadvantage. I was just
2 trying to ask a quick question so I don't know.

3 A. MR. FENNEL: Sorry, I just want to make sure
4 I'm clear on what I'm being asked.

5 Q. Sir, why don't I do this? Why don't I pose the
6 question, understanding your caveat and then your
7 qualification, and if you tell me, sir, that you
8 require that information to answer the question, then
9 we can take it at that. And if you say you can answer
10 the question without knowing that specifically, then
11 great, we can try that too. Okay?

12 A. MR. FENNEL: Well, let's see. Yeah.

13 Q. So if we go back to page 48 there. I'm just -- what
14 I'm trying to get at, sir, is this: You see that there
15 is -- and we can zoom in a little bit just above the B
16 with the apostrophe beside it, if we can zoom in on
17 that area. Do you see that purple outline, sir, that
18 purple shape?

19 A. MR. FENNEL: Yeah.

20 Q. You'd agree with me, sir, that's the dam structure;
21 right?

22 A. MR. FENNEL: It appears to be, yeah.

23 Q. And you can see there's a green squiggly line kind
24 of --

25 A. MR. FENNEL: Yes.

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Cross-examined by Mr. Barbero

1 Q. -- flowing into the dam, clearly the diversion
2 structure; right, sir?

3 A. **MR. FENNEL:** **Correct, correct.**

4 Q. And just -- can you confirm, looking at this diagram,
5 sir, that the hydraulic conductivity value for the
6 light blue regions denoted as clay is 5.1E-06
7 (verbatim). Do you see that, sir?

8 A. **MR. FENNEL:** **I do, yeah.**

9 Q. And sir, these regions represent the lacustrine clay
10 unit found at ground surface; right, do you understand
11 that?

12 A. **MR. FENNEL:** **It looks to be, yeah.**

13 Q. So sir, if we go back to your presentation,
14 Exhibit 384, and if we go to Slide 13, is the value
15 that we were just talking about, sir, consistent with
16 the value of the clay identified in Table E.1-2 as
17 presented?

18 A. **MR. FENNEL:** **It looks consistent, yes.**

19 Q. Thank you, sir.

20 Dr. Fennell, thank you for your time today.

21 **MR. BARBERO:** Mr. Chair, I have no further
22 questions for Dr. Fennell.

23 **THE CHAIR:** Thank you, Mr. Barbero,

24 Mr. Fennell. Sorry, is some -- yes.

25 So I think we will have some questions from staff

SCLG TOPIC #4 PANEL

Questioned by Mr. Ceroici

1 and Panel members.

2 Ms. Vance?

3 MS. VANCE: Thank you, sir. I actually have
4 no questions for this panel.

5 THE CHAIR: Mr. Kennedy?

6 MR. KENNEDY: And, in fact, I, too, have no
7 questions. Thank you.

8 THE CHAIR: Mr. Ceroici?

9 MR. CEROICI: Yes, I have a couple of questions
10 for Dr. Fennell.

11 **MR. CEROICI QUESTIONS THE PANEL:**

12 Q. Dr. Fennell, in your presentation, you had one slide
13 that talked about the characterization of groundwater
14 chemistry in shallow and in the bedrock suggesting
15 that, in reality, they're fairly similar. But I just
16 want to, you know, confirm that, in fact, they are a
17 bit different in that you'd expect the shallower
18 groundwater to be, you know, calcium bicarbonate type
19 and possibly more mineralized, given it's a fine grain
20 material --

21 A. MR. FENNELL: Correct.

22 Q. -- than the bedrock?

23 A. MR. FENNELL: Yes. I mean there is -- there are
24 differences for sure, but there's similarities, and I
25 think it depends on where you are.

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Questioned by Mr. Ceroici

1 So if you look at -- obviously the water in the
2 till, the clays, has more contact time. So, you know,
3 by extension, it should have a higher TDS, but it
4 doesn't always.

5 There's quite a variability actually in the TDS
6 values within the clays and tills, anywhere from 1,000
7 up to 2,000 milligrams per litre TDS.

8 Certainly in the upper part of the bedrock, we're
9 seeing higher concentrations of TDS which speaks to the
10 interaction between the overlying materials and the
11 upper part of the bedrock. As you get deeper down in
12 the bedrock, it sees to be more of a freshening trend.

13 What -- this is meant to be geochemical evidence
14 that there is some connectivity between the two.

15 Q. All right. Okay, thanks.

16 Another question on the -- you estimated the
17 seepage at a hundred thousand I think cubic metres per
18 day, I think it was, versus the Stantec of 483 --

19 A. MR. FENNELL: 426 I think it was.

20 Q. 426, right. So that's roughly three orders of
21 magnitude.

22 So does that imply in your calculation you're
23 using hydraulic conductivity two layers of magnitude
24 higher?

25 A. MR. FENNELL: Yes. I mean I've taken the

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Questioned by Mr. Ceroici

1 hydraulic conductivity values that have been provided
2 by -- by Alberta Transportation for the model for the
3 clay and the till. And I actually took -- I just took
4 a geometric average of the two to give me something
5 that would be roughly, you know, in the middle. And
6 then I applied, you know, a -- you know, the vertical
7 hydraulic conductivity averaged over the thickness
8 times the gradient.

9 So the gradient is, effectively, where is the
10 water table and where would the head of water be in the
11 reservoir? So if we've got, you know, 24 metres over,
12 you know, 2 metres, that's -- that's -- or 12 -- I
13 should say maybe an average of 12, let's say, instead
14 of taking worst-case scenario, that would be a gradient
15 of 6 and then applying that calculation to an area of
16 about 4.5 million square metres which is roughly the
17 1 in 100. And that's where I came up with that value.
18 It's in excess of that actually.

19 But I know it's a back-of-the-envelope type
20 approach, but I would have thought I would have got
21 closer to their number.

22 Q. Right, what hydraulic conductivity did you use in that,
23 I guess, it would be a Darcy flux calculation type?

24 A. MR. FENNELL: Yeah, I think it was in the order
25 of, somewhere like 5 times 10 to the minus 7 metres per

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Questioned by Mr. Ceroici

1 second or something like that. So it was kind of in
2 between the 5.1 times 10 to the minus 6 and the 7.2
3 times 10 to the minus 8.

4 Q. And would you feel that that hydraulic conductivity is
5 representative of the we'll call it the lacustrine
6 deposit in the till, fractured or unfractured?

7 A. MR. FENNELL: I'd say that's probably consistent
8 with a fractured type of media. But again, I think,
9 you know, depending on the actual properties of the
10 lacustrine clay and the --

11 You know, as you know when lacustrine deposits are
12 laid down, you can have clays and silts and clays and
13 silts and they can be rhythmically distributed. And so
14 you can have some higher hydraulic conductivity
15 associated with the, you know, the coarser fraction of
16 that type of lacustrine deposit.

17 Q. I just have one last question.

18 Also in your presentation, you did talk about,
19 we'll call it contaminants. You mentioned uranium,
20 selenium. I think you possibly mentioned pathogens and
21 maybe some others.

22 So, obviously, these materials under -- in the
23 subsurface behave in different ways. Could you maybe
24 comment on the mobility of those constituents, given
25 the relatively low conductivity of the materials at

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Questioned by Mr. Ceroici

1 this site? Like, what processes would limit their
2 movement?

3 **A. MR. FENNEL:** Well, I'm -- you know, we're
4 talking about pathways, and certainly that's -- this is
5 how contaminants will move through the subsurface
6 through pathways, whether it be a fracture or a sandier
7 higher permeable interval. And so they'll be conveyed
8 along with the groundwater.

9 Certainly not everything acts the same. Some
10 things are quite conservative and will actually move at
11 roughly the rate of groundwater flow. Others may be
12 subject to attenuation. They may associate with the --
13 with the mineral surface through absorption-type
14 reactions. They can also be just hydrodynamically
15 dispersed or mixed and concentrations can change that
16 way. So there's a number of things that can happen.

17 Now, it's important, particularly with things like
18 trace elements, you know, such as selenium or uranium,
19 it really depends on their oxidation reduction state.
20 And it will -- it will dictate their mobility
21 characteristics. They're positively charged, or
22 they're negatively charged. And that's the function of
23 the pH of the system; you know, the acidity or the
24 alkalinity of the system, and the redox or the -- the
25 reduction potential of the system.

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Questioned by Mr. Ceroici

1 And so the diagrams that I showed in my -- in my
2 submission provide an example for selenium and uranium,
3 showing the types of species that would be expected at
4 the assumed and documented pH conditions and estimated
5 redox conditions.

6 And it does show that these are in a mobile state
7 to some degree. They could be subject to some
8 attenuation, but the work would have to be done to
9 assess that. This is why, you know, it was pointed out
10 that there hadn't been any transporter fate-type
11 assessment work done which would have been useful.

12 Having said that, you know, if we've got some more
13 direct pathways, like a fracture, for example, the
14 water could transit through that much faster than a
15 clay itself or a till itself or a silt horizon.

16 So there are some complexities here, but there
17 are, you know -- hopefully that's at least helpful with
18 the -- with your question.

19 Q. Right. But I guess in the end, it's fair to say that
20 these natural attenuation mechanisms will cause
21 contaminant movements to differ for --

22 Like, for something that's conservative, like
23 chloride, will move much quicker than something that
24 might be absorbed at the source. So not all
25 contaminants will move at the same rate or the same

SCLG TOPIC #4 PANEL

Questioned by Ms. Roberts

1 distance?

2 **A. MR. FENNEL:** No, each contaminant has its own
3 mobility characteristics and toxicity characteristics,
4 and that'll be dictated by the form it's in.

5 **Q.** And things like pathogens, of course, to a fine-grain
6 material will be even possibly more movement
7 constrained because of biodegradation or pore size,
8 et cetera?

9 **A. MR. FENNEL:** Yes. I mean there is a half life
10 to these pathogens, as we know. But again, if it gets
11 into the right -- into the right pathway, I mean things
12 can move. It's a question of rate and time.

13 **Q.** Okay. Thanks very much, Dr. Fennell. That's all my
14 questions.

15 **THE CHAIR:** Thank you, Mr. Ceroici.
16 Ms. Roberts?

17 **MS. ROBERTS:** I have one question for Mr. Locke
18 if he's available.

19 **MS. ROBERTS QUESTIONS THE PANEL:**

20 **MR. LOCKE:** Hello.

21 **Q.** Good morning, Mr. Locke.

22 **THE CHAIR:** That was very quick. Thank you.

23 **A. MR. LOCKE:** I got the right button.

24 **Q.** This is more curiosity than anything else, Mr. Locke.

25 I understand that when the fish survey was done in

SCLG TOPIC #4 PANEL

Questioned by Ms. Roberts

1 2020, it had to align with restricted time periods, so
2 it was done in the fall. But our floods don't
3 typically happen in the fall; they more happen in June?

4 So I'm just curious, would the fish population at
5 the site be much different in June than what was
6 discovered in the fall when they actually did the
7 survey?

8 A. MR. LOCKE: Yes, anything's possible. It
9 could be the same or it could be different. Looking at
10 whatever population numbers that they had or
11 presence/absence that was done in I'm going to say it
12 was in August, sorry, I forget, 2020. You know, there
13 is other information on the -- on the Elbow River for
14 maybe not population numbers but presence/absence, and
15 I think it's pretty safe to say that whether it's
16 spring or summer or fall, that the fish will be
17 distributed up and down through the -- through the
18 Elbow River.

19 And so I don't know how you precisely would take a
20 number from August and apply it to June, but for the
21 purposes of how I look at the potential impact for this
22 project, I think it's safe to say that potentially fish
23 are going to be there.

24 Q. Thank you, Mr. Locke. It was more than anything, a
25 curiosity on my part.

SCLG TOPIC #4 PANEL

Questioned by Mr. Heaney

1 That's it for my questions, Mr. Chair.

2 THE CHAIR: Thank you, Ms. Roberts.

3 Dr. Heaney?

4 MR. HEANEY: Yeah, question for Dr. Locke.

5 MR. HEANEY QUESTIONS THE PANEL:

6 Q. When you were reviewing the entrainment as a proportion
7 of the fish population in the Elbow, would you consider
8 those to be conservative in the sense that they are on
9 the high end of what would be expected?

10 A. MR. LOCKE: So -- so I've done no calculations
11 with respect to entrainment.

12 I have read what the proponent has done for -- for
13 calculations, and I believe in the EI -- one of the EIA
14 documents, they -- they used a surrogate. They said
15 that, "Well, if 80 percent of the flow is being
16 diverted down the diversion channel, perhaps we could
17 assume that 80 percent of the fishes are going down the
18 diversion channel." That's a reasonable surrogate.

19 But then subsequent to that, they did a detailed
20 calculation based on the work of Dr. Post (phonetic).
21 And I guess for myself, I would view that as a -- I
22 don't know what to call it, conservative or that would
23 be the low number for fish.

24 I think the -- I think it's virtually impossible
25 to calculate with any great degree of precision the

SCLG TOPIC #4 PANEL

Questioned by Mr. Heaney

1 number of fish. Unfortunately, it's, you know, most of
2 this is just -- you know, we're doing the best
3 calculations we can. And I think in my submission, I
4 think that, you know, the number is probably somewhere
5 between the Dr. Post calculation and the original
6 80 percent. I think it's somewhere in between.

7 Q. Okay, thank you.

8 And just sort of a follow-up question, it's the
9 same idea with survival rates. Just do you think that
10 they were conservative in the sense that they erred on
11 the side of the lower -- you know, they expected lower
12 survival rate than what might be possible or the other
13 way around?

14 A. MR. LOCKE: I guess I didn't look at the
15 survival rate information that closely.

16 If -- so -- and I wouldn't consider myself an
17 expert in this, in terms of survival rates, but
18 clearly -- and are you meaning once the fish are --

19 Q. Entrained?

20 A. MR. LOCKE: -- into the reservoir, entrained,
21 yeah. Well, I think without question there's going to
22 be some sort of mortality associated with it, but I
23 don't know if their calculations would be considered
24 conservative or not. But I think -- I think it's safe
25 to assume there will be mortality, despite the best

SCLG TOPIC #4 PANEL

Questioned by Mr. Heaney

1 **efforts for rescuing the fish and getting them back to**
2 **the river.**

3 Q. And you would agree that the mortality would increase
4 with time in the reservoir?

5 A. **MR. LOCKE:** **From -- from -- yes, from the**
6 **information that I've looked at, I think that the**
7 **sooner the fish go back to the river, the better it is**
8 **for the fish, yes.**

9 Q. So, you know, you talked about prevention of
10 entrainment and, you know, it's the fence at the top of
11 the cliff, rather than the ambulance down in the valley
12 but -- as the old poem goes, but would you have any
13 further recommendations for improving survival in the
14 reservoir, in particular, things like, you know, would
15 oxygenation be useful, those kinds of things?

16 A. **MR. LOCKE:** **Yeah, I think if -- if -- if --**
17 **through whatever happens with the release scenario, if**
18 **both fish and water are retained in the reservoir, and**
19 **I think the information was that the oxygen would be**
20 **dropping the longer it's in there, then yes, anything**
21 **that could be done to keep the oxygen levels up, you**
22 **know, should be investigated to see if it's feasible.**

23 Q. Okay, thank you, Mr. Locke.

24 MR. HEANEY: Those are my questions, Mr. Chair.

25 THE CHAIR: Thank you, Dr. Heaney.

SCLG TOPIC #4 PANEL

Questioned by The Chair

1 Mr. Locke, my question may be to you, but it may
2 not be, so I'll let Mr. Secord or others decide.

3 **THE CHAIR QUESTIONS THE PANEL:**

4 Q. And it's a bit of -- this question may be a bit out of
5 place, and it's only because of when you folks are up
6 on the panel that made some sense for me to ask this
7 perhaps. But there's been a lot of talk by interveners
8 in particular about alternatives, so we covered that
9 primarily in Topic Area 1, but it's come up even here
10 in some of the cross-examination and some of the
11 evidence provided by I think Dr. Fennell and others.

12 So my question is, you know, if this has been a
13 viewpoint of interveners that drought mitigation should
14 have been part of the project plan, as opposed to
15 strictly flood mitigation, has anybody asked you or
16 have you looked at the potential for the Elbow to
17 support drought mitigation in any event?

18 So if drought was to be the primary objective of a
19 reservoir or off-stream reservoir just as an example,
20 were you asked to look at that, the potential for the
21 Elbow to support quantities of water on an annual basis
22 being diverted for drought mitigation?

23 And if not, would you have an opinion on that,
24 wondering if you have done some of that in-stream work
25 versus in the past?

SCLG TOPIC #4 PANEL

Questioned by The Chair

1 A. MR. LOCKE: No, I've not looked at any aspect
2 of drought management with this project. I've just
3 looked at the project as presented and the release
4 scenarios as presented.

5 I'm not -- I'm not sure I can provide a --
6 anything, in terms of drought management. Any time you
7 apply a water management structure, of course, you can
8 solve some problems, but potentially you create other
9 problems.

10 So I guess that's how, you know, I would approach
11 it is, well, what are the various parameters, things
12 that we would be concerned about. And, you know, my --
13 my assumption would be there would be pluses for some
14 things, and there would be minuses for other.

15 But I just -- no, I have not thought about the
16 drought side of it at all.

17 A. MR. FENNELL: Mr. Chair, it's Jon Fennell here.
18 I'm wondering if I could maybe add a quick comment
19 there to help out.

20 Obviously the reservoir was built -- the Glenmore
21 Reservoir was built where it was because it was on the
22 Elbow River, and the Elbow River has the ability to
23 fill it.

24 And so I think right there, that speaks to the
25 fact that, you know, that there can be enough water

SCLG TOPIC #4 PANEL

Questioned by The Chair

1 flowing into it to fill it probably a number of times
2 in a year 'cause there's always flow going out of it.

3 So it would really depend on the year, right, but
4 I would think that if we were in a low
5 rainfall/snowfall year, I mean obviously the flow
6 coming down the Elbow was going to be much, much less,
7 and the city of Calgary is going to want to hold that
8 water and capture that water because they're going to
9 need it because they won't have it later in the season.

10 But I think the fact that there is a reservoir
11 there kind of speaks to it.

12 A. MR. KLEPACKI: Mr. Chair, I did some
13 calculations.

14 THE COURT REPORTER: Sorry, who's speaking?

15 A. MR. KLEPACKI: Hello?

16 THE COURT REPORTER: Sorry, who's speaking?

17 MR. SECORD: Identify your voice.

18 A. MR. KLEPACKI: Yeah, this is -- yeah, you bet.
19 This is Dave Klepacki I did some calculations awhile
20 ago about the ability -- start me video, yeah. I don't
21 know, my bandwidth is pretty limited here, but I'll
22 give it a go.

23 MR. SECORD: I don't think you need to do that.

24 A. MR. KLEPACKI: Anyway, what I calculated from the
25 hydrograph, Manley's 2006 hydrograph for the

SCLG TOPIC #4 PANEL

Questioned by The Chair

1 Elbow River flows, was that the Elbow River could --
2 could fill a 70,000 dam reservoir four times in the
3 course -- located at MC1 four times in the course of a
4 year.

5 Now, of course, that's not practical because you
6 have the environmental requirements downstream, and you
7 have the city of Calgary's water requirements which are
8 one quarter of the flow of the Elbow River.

9 So it's realistic to expect you could actually
10 fill a reservoir twice in the -- in the course of a
11 year. Yeah, that's what I did anyway, just simple --
12 simple flow calculations.

13 THE CHAIR: Right, but there would be a number
14 of other, as Mr. Locke has pointed out, considerations.

15 So my question is really, you know, this Panel
16 fully understands that it's SR1 in front of us; it's
17 just that because it has been brought up so often, I
18 was wondering if someone with the expertise in looking
19 at what requirements would be required for drought, in
20 terms of water, and whether or not the Elbow would
21 support it any way if it was done. And it doesn't
22 sound like that was considerable to any of you folks at
23 least. So that I mean, essentially, answers my
24 questions. Thank you very much.

25 Thank you, Panel. That is all of the questions

SCLG TOPIC #4 PANEL

Re-examined by Mr. Secord

1 from the Board staff and the Panel.

2 Mr. Secord, did you have any redirect?

3 MR. SECORD: I think just two items, and for
4 some reason, Mr. Chair, I don't have any video, so
5 hopefully you can hear.

6 THE CHAIR: Yes.

7 MR. SECORD: My video doesn't appear to be
8 working, so after the break, I will log off and maybe
9 get this fixed.

10 MR. SECORD RE-EXAMINES THE PANEL:

11 Q. But for Dr. Fennell, and I'm not sure that it's
12 redirect, but with the -- with the permission from my
13 friends, Mr. Kruhlak, I did send you Exhibit 390 which
14 was the snow data. I expect you haven't had a chance
15 to look at it. Okay, so that's crossed off my list.

16 And then Dr. Locke, are you there?

17 A. MR. LOCKE: Yes, Mr. Locke is here.

18 Q. If he can be brought up?

19 A. MR. LOCKE: Dr. Locke, Mr. Locke, sorry. I'm
20 sorry, Mr. Locke.

21 You were having a discussion with Mr. Fitch, and
22 did I hear you correctly saying that -- that under a
23 late release scenario, the fish could be held in the
24 reservoir from June to December.

25 A. MR. LOCKE: I -- I think the late release is

SCLG TOPIC #4 PANEL

Re-examined by Mr. Secord

1 that water would not come out for a period of time so
2 that fish potentially would be in the reservoir longer,
3 yes.

4 Q. And that could be as long as -- they could be in there
5 until December of the calendar here; did I hear that
6 correctly? I'm just not sure. Is there anything --
7 I'm not sure that I was clear on your discussion with
8 Mr. Fitch, if you wouldn't mind just clarifying that?

9 A. MR. LOCKE: I think the question was if we
10 were to do the late release and try to adhere to a
11 10 percent criterion, that water would continue to be
12 released until sometime in December I think was the
13 question from Mr. Fitch.

14 And he asked me if -- did I understand that, and I
15 said yes, I understood that it would be -- the water
16 would be held or being released until December, yes.

17 Q. And is there any -- any other -- any other
18 clarification you need to make with respect to this
19 moving from a late to an early release scenario?

20 A. MR. LOCKE: Yeah, I think the -- well, the
21 early release scenario would be better. And it was
22 pointed out to me, and I -- I actually did review that
23 document, but for some reason, the paragraph about
24 having the fish -- or sorry, having the release earlier
25 to -- would be beneficial. And yes, and it would be

SCLG TOPIC #4 PANEL

Re-examined by Mr. Secord

1 beneficial.

2 And I have followed up with that and just said
3 that -- and perhaps they've already done it to come up
4 with the early release is that releasing perhaps a
5 higher volume of water earlier to release what would be
6 turbid water to match the turbid water that would be in
7 the Elbow River may not be suitable for -- for flood
8 purposes in the sense that you may still be over bank,
9 down below, so that would be considered, but then you
10 could maybe fine-tune the release, you know, from,
11 let's say, down to bankful, and then from bankful down.
12 Just looking at what I would consider to be tweaking
13 the early release scenario is what I think would be
14 beneficial.

15 Q. And then just to be clear, the exhibit that Mr. Fitch
16 referred you to that you said you hadn't reviewed, in
17 fact, you had reviewed that document?

18 A. MR. LOCKE: Yes. Out of the 50 pages I was
19 expected to review, the -- yes, so I -- and I'm sorry,
20 I don't know the exhibit number, but I call it SIR
21 Package 4 Technical Review Round 2, March 2020. It
22 turns out that, yes I did, and for some reason, I
23 missed that paragraph. But I did not flag any of it as
24 I thought it was all positive, that that was happening.

25 And I guess my only general observation is that

SCLG TOPIC #4 PANEL

Re-examined by Mr. Secord

1 the -- there was a lot of communication between the
2 regulators and the proponent over a number of years
3 where the regulators were asking these sorts of
4 questions and that the proponent did answer them and
5 provide the, you know, detailed technical information.

6 MR. FITCH: Mr. Chair, it's Gavin Fitch.
7 Just for the record, the witness said he couldn't
8 remember the exhibit number. It's Exhibit 218.

9 THE CHAIR: Thank you, Mr. Fitch.

10 MR. SECORD: Thank you, Gavin. And that's all
11 of my redirect, sir. Thank you.

12 THE CHAIR: Thank you, Mr. Secord, and thank
13 you to the panel on this topic. Much appreciated.
14 Sorry?

15 A. MR. FENNELL: Thank you, Mr. Chair, and panel.

16 THE CHAIR: Thank you. It's close to lunch
17 break, and we may be able to get through a couple items
18 before we get to potential rebuttal here.

19 Mr. Williams, did you have any questions for the
20 panel?

21 MR. WILLIAMS: No, I didn't.

22 THE CHAIR: Okay, well, thank you, and because
23 I don't recall you being online previously. So in
24 terms of direct evidence on Topic 4, Mr. Williams, did
25 you have anything to submit? Sounds like we've got a

SCLG TOPIC #4 PANEL

Re-examined by Mr. Secord

1 bit of a --

2 MR. WILLIAMS: Yeah, sorry, I think I got rid of
3 it now. Can you hear me?

4 THE CHAIR: Yes, that's much better. Thank
5 you.

6 MR. WILLIAMS: Yeah, okay, sorry about that.
7 I've got the desktop going with the phone here.

8 No, I just -- I guess my question on the direct is
9 with evidence that was filed as information, but we --
10 we -- there was some information on water licenses that
11 was filed by AT on Monday, the 22nd, and then a further
12 email on the morning this last Monday at 4:55 a.m.

13 This information -- this email was sent to us, we
14 can't find it as -- as exhibits in the information. So
15 our belief is that AT won't use any of this information
16 that they sent by email to us, Bill Kennedy and Laura.

17 I don't need to discuss it in any length. I guess
18 my only question would be to AT is is the intention to
19 use that?

20 They've already identified our franchise agreement
21 which has this information in it. I just want to know
22 this before we leave Topic Area 4 on water because it's
23 water licenses, because of the opportunity to use this
24 information for us in our closing arguments.

25 THE CHAIR: Mr. Williams, was this an

SCLG TOPIC #4 PANEL

Re-examined by Mr. Secord

1 undertaking, Mr. Fitch, or Mr. Kruhlak?

2 MR. KENNEDY: Perhaps before Mr. Fitch comes --

3 COURT REPORTER: Sorry, who's speaking?

4 MR. KENNEDY: -- I've had some discussions

5 and --

6 COURT REPORTER: Sorry, who's speaking?

7 MR. KENNEDY: -- exchanged some emails with

8 Mr. Williams offline and he was -- he wanted to tender

9 documents, licenses and other documents that were

10 identified in aids to cross that were circulated by

11 email by Alberta Transportation, and I could not recall

12 whether they were -- were entered as exhibits, and I

13 directed Mr. Williams perhaps to check the transcript

14 records. And I assume, from his comments now, that

15 they were not used by Alberta Transportation as aids to

16 cross. And my advice to Mr. Williams was those

17 documents then do not become exhibits if they're not

18 actually used as an aid to cross and presented to the

19 hearing.

20 MR. KRUHLAK: Mr. Chairman, it's Ron Kruhlak.

21 Perhaps I can also assist as I was -- I submitted those

22 documents, and Mr. Kennedy's recollection's correct. I

23 had a number of aids to cross. I asked Mr. Williams

24 questions, determined it was not needed to put those

25 additional documents to him. And the sole document

SCLG TOPIC #4 PANEL

Re-examined by Mr. Secord

1 that we -- we did mark was the AUC decision pending the
2 franchise agreement because that document was
3 referenced to and discussed at some length. So the
4 balance of those documents are not in evidence.

5 MR. WILLIAMS: Okay.

6 THE CHAIR: No need for further actions,
7 Mr. Williams.

8 MR. WILLIAMS: No, that's perfect. That's all
9 the requests I had. So I have no other direction.

10 THE CHAIR: Thank you, Mr. Williams. Thank
11 you, Mr. Kruhlak and Mr. Kennedy.

12 Mr. Wagner, do you have any direct on Topic
13 Area 4?

14 MR. WAGNER: I do not, Mr. Chair.

15 THE CHAIR: Okay, thank you, Mr. Wagner.

16 So Transportation, do you have rebuttal evidence,
17 and if so, would it be better after a break or before?
18 So first, I guess, is do you have rebuttal?

19 MR. BARBERO: Mr. Chair, Michael Barbero here.
20 We have no rebuttal evidence.

21 THE CHAIR: Okay.

22 Well, I think, then, before we get started on the
23 next topic area, it is a good time for the break, and
24 it's pretty close to noon, so let's come back at one
25 o'clock and start on Topic Area 5. Thank you.

SCLG TOPIC #4 PANEL

Re-examined by Mr. Secord

1 (PROCEEDINGS ADJOURNED AT 11:51 A.M.)

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3 PROCEEDINGS ADJOURNED TO 1:00 P.M.

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SCLG TOPIC #4 PANEL

Re-examined by Mr. Secord

1 Volume 8

2 March 31, 2021

3 P.M. Session

4

5 (PROCEEDINGS COMMENCED AT 12:59 P.M.)

6 THE CHAIR: Ms. Taylor, welcome. Are you
7 online for document management this afternoon?

8 MS TAYLOR: Good afternoon, Mr. Chair. Yes,
9 I'm available.

10 THE CHAIR: Thank you. Any prelim matters
11 before we get started?

12 MR. SECORD: Yes, one preliminary matter.

13 Mr. Chair, I had a conversation with Mr. Barbero
14 and Mr. Kruhlak over lunch. I was contacted by
15 Dr. Fennell, and he had a correction that he wanted to
16 make to the evidence that he gave to Mr. Barbero.

17

18 **A. LOCKE, J. FENNELL, D. KLEPACKI (For SCLG),**

19 **previously affirmed**

20 **MR. SECORD RE-EXAMINES THE WITNESS:**

21 Q. So, Dr. Fennell, are you there? And perhaps you could
22 just speak to the correction that you would like to
23 make to the record.

24 A. MR. FENNELL: Yes, I am. Thank you, Mr. Secord.

25 Mr. Chair, Panel members, I did make an error in

SCLG TOPIC #4 PANEL

Re-examined by Mr. Secord

1 one of my statements.

2 When Mr. Barbero was taking me through I believe
3 it was my slide deck, Exhibit 384, PDF page 14, when we
4 were discussing on length about the -- where the clay
5 and where the till were located, and then he took me to
6 the newly filed Exhibit 375, PDF page 48, and
7 identified where -- where the units were located there.

8 I went back, and I checked my data, and I actually
9 saw that where I labelled on my slide where clay and
10 till were -- had been shifted. And so I was inaccurate
11 in where I was saying -- where I had labelled things,
12 where those labels had fell. So, in actual fact, they
13 do align.

14 This doesn't change anything in my original
15 submission for the SCLG back in February, but in my
16 testimony today, it does change some of that and some
17 of my testimony yesterday.

18 Noting that change, it doesn't actually make any
19 material difference to the findings of my study with
20 respect to the absence of the near-surface sand and
21 gravel deposits located in the Unnamed Creek which were
22 not included in that model error, as well as the
23 seepage estimates.

24 So I just wanted to make sure that that was on the
25 record. I do apologize for that oversight. I do

SCLG TOPIC #4 PANEL

Re-examined by Mr. Secord

1 apologize to Mr. Barbero for the confusion and to
2 Alberta Transportation as well.

3 Q. And, Dr. Fennell, you're going to file a revised Slide
4 14, and you'll provide that to me for -- so that we can
5 get it uploaded as an exhibit; is that correct?

6 A. MR. FENNEL: That is correct, yes.

7 Q. And would you also, when the transcript comes out,
8 would you also just check the transcript exchanges with
9 Mr. Barbero and provide us with corrections to any of
10 the questions and answers that might be changed as a
11 result of this new information. Is that agreeable?

12 A. MR. FENNEL: Yes, I'll undertake to do that.

13 UNDERTAKING - TO HAVE MR. FENNEL CHECK
14 THE TRANSCRIPT EXCHANGES WITH
15 MR. BARBERO AND PROVIDE CORRECTIONS TO
16 ANY OF THE QUESTIONS AND ANSWERS THAT
17 MIGHT BE CHANGED AS A RESULT OF THE NEW
18 INFORMATION PROVIDED

19 MR. SECORD: And, Mr. Chair, as I mentioned to
20 Mr. Kruhlak and Mr. Barbero, if they do have questions
21 about this, we're certainly prepared, subject to, of
22 course, your permission to provide Dr. Fennell at some
23 point in time, if they have additional questions as a
24 result of this change.

25 THE CHAIR: Right. Mr. Barbero, do you have a

1 redirect at this moment?

2 MR. BARBERO: No, Mr. Chair, nothing at this
3 moment.

4 THE CHAIR: Okay. Thank you. And thank you,
5 Mr. Secord. Thank you, Dr. Fennell.

6 (WITNESS STANDS DOWN)

7 MR. SECORD: Thank you.

8 And just one other preliminary matter. We did get
9 Exhibit 31 from Mr. Kruhlak today, and it does look
10 like I'm going to have questions on this document. And
11 I think what we're going to do is prepare an aid to
12 cross and provide that to Mr. Kruhlak, and I expect
13 that I will have questions for Alberta Transportation
14 tomorrow morning on that aid to cross resulting from
15 Exhibit -- I shouldn't say Exhibit 31, Undertaking 31
16 that's been marked as Exhibit 390. So just a heads up
17 on that.

18 And I suppose, at the same time, tomorrow would be
19 also probably a good time to have any questions on the
20 outstanding undertakings. So hopefully if we have any
21 additional questions on the answers to undertakings, we
22 can get them dealt with tomorrow, tomorrow morning.

23 THE CHAIR: Agreed. And, Ms. Vespa, that
24 was -- Mr. Secord, you kind of faded. When you
25 referred to exhibit number, that was 390. Is that

ALBERTA TRANSPORTATION TOPIC #5 PANEL

1 right?

2 MR. SECORD: 390, Undertaking 31.

3 THE CHAIR: Ms. Vespa, did you get that?

4 Thank you. And welcome this afternoon, Ms. Vespa.

5 Okay. Any other preliminary matters before we
6 start?

7 So Alberta Transportation, we have you down for
8 30 minutes for direct under Topic 5: Air, Human
9 Health, and Terrestrial. I thought Mr. Kennedy
10 indicated you might have a request for time; is that
11 correct?

12 MR. BARBERO: That's correct, Mr. Chair. If
13 possible, we anticipate needing something more in the
14 order of 45 minutes to maybe even an hour for our
15 direct.

16 I can tell you, sir, we will endeavor to reduce
17 correspondingly in our cross-examination so as not to
18 affect the overall time for this topic, sir.

19 THE CHAIR: Okay. I was going to remind
20 Mr. Secord, I think he owed me 25 minutes or so. So
21 you might be doing a horse trade here anyway.

22 Thanks, please proceed.

23 MR. BARBERO: Very good, sir, thank you.

24 Well, good afternoon, Mr. Chair, members of the
25 Panel. As you know, my name is Michael Barbero with

ALBERTA TRANSPORTATION TOPIC #5 PANEL

1 Alberta Transportation.

2 Sir, I'll be introducing the Alberta
3 Transportation panel for Topic 5, air quality, human
4 health, and terrestrial.

5 Sir, as with prior panels, what I will do is,
6 after having the witnesses sworn or affirmed, I will
7 introduce each witness, have them speak to their
8 involvement in this matter.

9 Following that, Mr. Hebert, Mr. Reid, and -- I'm
10 sorry, Mr. Person, and Ms. Noble will deliver opening
11 remarks.

12 I can advise that Mr. Person will have a
13 PowerPoint presentation for his portion of his remarks.
14 This has been circulated to counsel and to the NRCB
15 document manager.

16 Sir, I'll start off by having those members of
17 what we've been referring to as the "common panel" just
18 confirm that they remain under oath at this time.

19 Starting with Mr. Hebert.

20

21 M. HEBERT, M. SVENSON, W. SPELLER, D. BRESCIA, M. WOOD,
22 J. HALLSON, T. NOBLE, N. DE CARLO, E. TERRY, I. WHITSON,
23 R. PERSON, D. BUCHANAN (For Alberta Transportation),
24 previously sworn, sworn/affirmed

25

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Examined by Mr. Barbero

1 **MR. BARBERO EXAMINES THE PANEL:**

2 Q. Mr. Hebert, sir, are you there?

3 A. **MR. HEBERT:** Yes, I am.

4 Q. Can you please acknowledge that you are still under
5 oath?

6 A. **MR. HEBERT:** Yes, I acknowledge I remain under
7 oath.

8 Q. Thank you, sir.

9 Mr. Speller, are you there, sir?

10 A. **MR. SPELLER:** I am. Good afternoon.

11 Q. Good afternoon. Can you acknowledge that you still are
12 under oath.

13 A. **MR. SPELLER:** Yes, I am.

14 Q. Thank you, sir.

15 Mr. Brescia, are you there?

16 A. **MR. BRESCIA:** Yes, I am.

17 Q. Sir, can you acknowledge you are still under oath?

18 A. **MR. BRESCIA:** Yes, I do.

19 Q. Mr. Brescia, I noticed a bit of feedback with your
20 microphone. I don't know if it was just me or not.

21 A. **MR. BRESCIA:** I'll try to fix that.

22 Q. Thank you, sir.

23 Mr. Wood, can you kindly acknowledge that you are
24 still under oath, sir?

25 Mr. Wood, I don't think I caught that. Again, I

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Examined by Mr. Barbero

1 don't know if it's just me.

2 THE CHAIR: I did not hear Mr. Wood.

3 Q. MR. BARBERO: Mr. Wood, are you there?

4 Mr. Chair, I think I gave Mr. Wood my headset from
5 this morning.

6 A. MR. WOOD: Testing, testing.

7 Q. There you are. Mr. Wood, sir, I can hear you now.

8 Can you acknowledge you are still under oath?

9 A. MR. WOOD: Yes, I am still under oath.

10 Q. Thank you.

11 Mr. Svenson, can you acknowledge that you are
12 still under oath, sir?

13 A. MR. SVENSON: Yes, I am still under oath.

14 Q. Thank you.

15 MR. BARBERO: Mr. Chair, we're also bringing
16 back two witnesses from prior panels to sit on this
17 panel. Those two witnesses are Ms. Hallson and
18 Dr. Buchanan.

19 Ms. Hallson, are you there?

20 A. MS. HALLSON: Yes, I am.

21 Q. Can you kindly acknowledge that you are still under
22 oath?

23 A. MS. HALLSON: Yes, I am.

24 Q. Thank you.

25 Dr. Buchanan, are there, sir?

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Examined by Mr. Barbero

1 **A. MR. BUCHANAN:** **Yes, I am.**

2 **Q.** Good afternoon, sir. Can you acknowledge that you
3 remain under oath?

4 **A. MR. BUCHANAN:** **Yes, I'm still under oath.**

5 **Q.** Thank you.

6 **MR. BARBERO:** With that, I would ask Madam Court
7 Reporter, please proceed to have the new witnesses
8 sworn or affirmed as per their preference.

9 Madam Court Reporter, I'll go through them one at
10 a time.

11 (DISCUSSION OFF THE RECORD)

12 **Q. MR. BARBERO:** I'd like to start with Mr. Person.
13 Sir, can you please confirm that your curriculum vitae
14 has been filed as part of Exhibit 336 at PDF page 79?

15 **A. MR. PERSON:** **Yes, that's correct.**

16 **Q.** Thank you, sir. And can you confirm that you work at
17 Stantec as a principal and senior air quality engineer?

18 **A. MR. PERSON:** **Yes.**

19 **Q.** Sir, can you speak your education and relevant
20 experience, please?

21 **A. MR. PERSON:** **Sure.**

22 **THE CHAIR:** Sorry, Mr. Person, sorry to
23 interrupt. Ms. Vespa, can you hear Mr. Person?

24 **THE COURT REPORTER:** It's very soft. Moving your mic a
25 little closer might help. Thanks, Mr. Person.

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Examined by Mr. Barbero

1 **A. MR. PERSON:** Try this again. Can you hear me
2 now?

3 **THE CHAIR:** It's a little better. Still,
4 pretty soft.

5 **THE COURT REPORTER:** If you can keep your voice up, it
6 will help.

7 **THE CHAIR:** Just elevate your voice if you
8 could, thank you.

9 **A. MR. PERSON:** I completed a bachelor of
10 environmental engineering at the University of Regina
11 in the year 2000, as well as a master's of
12 environmental engineering at the University of Calgary
13 in 2007.

14 I've worked on air quality assessments, including
15 emission inventories, meteorological and dispersion
16 modelling, and I've led the air quality assessment
17 of -- the air quality assessment components of
18 environmental impact assessments on a number of
19 projects over the past 21 years.

20 I have appeared as an expert witness at prior
21 regulatory hearings.

22 **Q.** Thank you, sir. And what was your role in this
23 application, including involvement or preparation of
24 any records, responses to SIRs or the like?

25 **A. MR. PERSON:** I've worked with the air quality

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Examined by Mr. Barbero

1 assessment team on this project since 2016 to complete
2 the emission inventory, complete dispersion modelling,
3 and write the air quality assessment sections of the
4 EIA.

5 At the initial stages of the project, my
6 involvement was primarily as a technical advisor and
7 quality reviewer. After submission of the EIA in 2018,
8 I took over as the air quality discipline lead, and I
9 have been responsible for authoring the air
10 quality-related SIR responses and hearing submissions.

11 Q. Thank you, sir.

12 Ms. Noble.

13 A. MS. NOBLE: Yes.

14 Q. Good afternoon. Can you please confirm that your CV
15 has been filed at Exhibit 336, page 84?

16 A. MS. NOBLE: Yes, I can.

17 Q. And can you confirm that you work at Stantec as a
18 senior principal and senior risk assessment specialist?

19 A. MS. NOBLE: Yes, I do.

20 Q. Thank you. And can you speak to your education and
21 relevant experience, please.

22 A. MS. NOBLE: I completed a bachelor of science
23 in engineering at the University of New Brunswick in
24 1994, as well as a master's of engineering at the
25 University of New Brunswick in 2004.

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Examined by Mr. Barbero

1 Since 1997, my professional experience has been
2 primarily in the fields of human health and ecological
3 risk assessment and water resources. I've assessed a
4 wide range of contaminants at sites across Canada as
5 well as United States.

6 I've supported human health risk assessment
7 components of multiple environmental impact assessments
8 since 2003.

9 Q. Ms. Noble, thank you. I might just add, it's sometimes
10 helpful for the court reporter if you could speak a
11 little slower. I can see her working quite diligently
12 there on the screen.

13 THE CHAIR: Thank you for that reminder,
14 Mr. Barbero.

15 Q. MR. BARBERO: Ms. Noble, let's continue on.

16 What was your role in the application, in
17 particular, preparation of any reports, responses to
18 SIRs or the like, and also are there any errors or
19 corrections you'd like to speak to at this time?

20 A. MS. NOBLE: Yes. I have been involved with
21 the health assessment for the EIA since 2014, providing
22 senior technical support and quality review of the
23 human health risk assessment and public health sections
24 of the EIS.

25 I have been responsible for authoring human

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Examined by Mr. Barbero

1 health-related supplemental information request
2 responses and hearing submissions.

3 While preparing for Topic 5, I found an error in
4 the spreadsheet that was used to generate the maximum
5 predicted concentrations and frequency of occurrence
6 reported in Table 3-9, Exhibit 327, page 188. The
7 error primarily affected the one-hour PM 2.5
8 concentrations.

9 There were no changes to the risk metrics,
10 exposure ratios, reported in Tables 3-1 to 3-8, the
11 identification of affected receptors, nor the
12 characterization of the maximum frequency of occurrence
13 as less than 1 percent of the time for one-hour
14 exposure and less than 4 percent of the time for
15 24-hour exposure.

16 As a result, there's no change to the conclusion
17 that predicted fugitive dust emissions will not result
18 in significant adverse effects on ambient air quality
19 or human health.

20 Q. Thank you, Ms. Noble.

21 MR. BARBERO: Mr. Chair, we have circulated the
22 revised table to counsel earlier this week. I guess
23 I'm just wondering, sir, if it makes sense that that be
24 brought up now and marked as an exhibit so that we have
25 it moving forward or if there's a preferred alternative

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Examined by Mr. Barbero

1 approach to that.

2 THE CHAIR: I think it does make sense. Let's
3 do that now.

4 MR. BARBERO: Document manager, if you could
5 please bring that up.

6 This does not appear to be the correct document.

7 MR. SECORD: It's the SR1 errata.

8 THE CHAIR: So has that been sent to
9 Ms. Taylor, Ms. Friend? It will not have an exhibit
10 number; correct?

11 MR. BARBERO: I believe it was sent to
12 Ms. Friend; but, no, it has not been entered as an
13 exhibit.

14 THE CHAIR: Ms. Taylor may not have it quite
15 yet.

16 Ms. Friend?

17 MR. BARBERO: If it's of any assistance, it went
18 in with my correspondence providing Mr. Person's
19 PowerPoint presentation and the opening statement for
20 today's topic. They were all sent together at the same
21 time.

22 MS. FRIEND: This is Laura. Maybe she's found
23 it.

24 MR. BARBERO: That's the one, thank you.

25 Q. So, Ms. Noble, is this the errata that you were

ALBERTA TRANSPORTATION TOPIC #5 PANEL

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1 referring to a moment ago?

2 A. MS. NOBLE: Yes, it is.

3 Q. And if we scroll down, ma'am, to the next page.

4 This is the table that's been corrected?

5 A. MS. NOBLE: Yes, that's right. The values

6 that have changed are shown in blue.

7 Q. In blue. Thank you, ma'am.

8 MR. BARBERO: Mr. Chair, I'd ask we mark this as

9 the next exhibit, sir.

10 THE CHAIR: Thank you.

11 Ms. Friend, the next exhibit number would be?

12 MS. FRIEND: That would be 391.

13 THE CHAIR: 391 for the errata. Thank you.

14 MR. BARBERO: Thank you, Mr. Chair.

15 EXHIBIT 391 - ERRATA 1 FOR EXHIBIT

16 327 - REVISED TABLE BLUELINED

17 Q. MR. BARBERO: Dr. Whitson, sir, are you there?

18 A. MR. WHITSON: Yes, I'm here.

19 Q. Good afternoon, sir. Can you confirm that your CV has
20 been filed as part of Exhibit 336 at PDF page 37?

21 A. MR. WHITSON: Yes.

22 Q. And, sir, can you confirm you are director of an
23 independent consulting company in I Whitson Innovations
24 Inc. and are a subcontractor to Stantec Consulting Ltd.
25 for the SR1 project?

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Examined by Mr. Barbero

1 **A. MR. WHITSON:** **Yes, I am.**

2 **Q.** And, sir, what is your education and relevant
3 experience?

4 **A. MR. WHITSON:** **I have a bachelor's degree in**
5 **agriculture, specializing in soil science, and a PhD in**
6 **environmental biology and ecology, both obtained at the**
7 **University of Alberta.**

8 **I'm a senior soil scientist with more than three**
9 **decades of soil survey experience conducted in forest,**
10 **rangeland, and agricultural landscapes.**

11 **I have experience in several aspects of soil**
12 **science in addition to soil survey, soil reclamation,**
13 **soil water interactions, nutrient transport, and soil**
14 **quality assessment involving both boreal and prairie**
15 **soils.**

16 **Q.** Thank you, sir. And what was your role in this
17 application? Did you prepare reports, responses to
18 SIRs or the like, sir?

19 **A. MR. WHITSON:** **I conducted the assessment of**
20 **project effects on soil quality and capability,**
21 **starting in 2016.**

22 **I've been part of the project team since then,**
23 **contributing to information requests, responses, and**
24 **preparations for this hearing.**

25 **Q.** Thank you, Dr. Whitson.

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Examined by Mr. Barbero

1 Mr. De Carlo, are you there, sir?

2 A. MR. DE CARLO: Yes, I'm here.

3 Q. Sir, you can confirm that your CV has been filed as
4 part of Exhibit 336 at PDF page 74?

5 A. MR. DE CARLO: Yes, I can.

6 Q. Thank you, sir. And you can confirm that you work at
7 Stantec as a senior vegetation ecologist?

8 A. MR. DE CARLO: Yes, that is correct.

9 Q. And, sir, what is your education and relevant
10 experience?

11 A. MR. DE CARLO: I completed a bachelor of science
12 in ecology at the University of Calgary in 2000, and I
13 have worked on multidisciplinary environmental impact
14 assessments for approximately the past 20 years.

15 I have experience working on all aspects of
16 projects from preliminary planning to reclamation and
17 post-reclamation monitoring.

18 I have assessed potential effects to vegetation in
19 wetlands from various types of projects including
20 roads, flood management, rail, oil and gas, wind
21 energy, and urban development.

22 Q. Thank you, sir. With regards to this application, what
23 was your role and what involvement did you have in
24 preparing reports and responses to SIRs?

25 A. MR. DE CARLO: I am the lead vegetation ecologist

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Examined by Mr. Barbero

1 for the vegetation and wetland assessment. I started
2 the work in March 2018. I supervised the revised
3 submission of the EIA and authored supplemental
4 information request responses, and the vegetation
5 monitoring and revegetation plan.

6 I am also familiar with the EIA and take
7 responsibility for the vegetation and wetland
8 assessment portion.

9 Q. Thank you, sir.

10 Mr. Terry, are you there?

11 A. MR. TERRY: Yes, I am.

12 Q. Good afternoon, sir. Can you confirm that your CV has
13 been filed, and that it is correct, as part of
14 Exhibit 336 at PDF page 32?

15 A. MR. TERRY: Yes, I can. But I note that there
16 is a typo in the introduction to my CV. It currently
17 says I have over 20 years of professional work
18 experience. It should say I have over 30 years of
19 professional experience.

20 Q. Thank you, sir.

21 And, sir, you can confirm that you work at Stantec
22 as a senior wildlife biologist?

23 A. MR. TERRY: That's correct.

24 Q. Thank you, sir. Now, what is your education and
25 relevant experience?

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Examined by Mr. Barbero

1 A. MR. TERRY: I completed a bachelor of science
2 in wildlife biology from the University of Guelph in
3 1984 and a master of science from the University of
4 British Columbia in 1994.

5 I have over 30 years of professional work
6 experience. I have provided environmental consulting
7 services to a number of sectors, including government,
8 mining, forestry, oil and gas, oil sands, hydroelectric
9 transportation, and municipal infrastructure.

10 My area of expertise focuses on wildlife-related
11 issues associated with environmental impact assessment,
12 mitigation, and monitoring.

13 In addition to consulting, I have eight years of
14 post secondary teaching experience where I taught at
15 Lethbridge College, School of Environmental Sciences.

16 Q. Thank you, sir. And with regards to this application,
17 can you advise as to your role and what involvement you
18 had in preparing any reports or responses to SIRs?

19 A. MR. TERRY: I was the technical advisor for
20 the wildlife component of the EIA. I provided
21 technical review of the wildlife information presented
22 in the EIA and prepared the SIR responses and other
23 technical deliverables through this regulatory process.

24 Q. Thank you, sir.

25 MR. BARBERO: Mr. Chair, at this time, I would

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Examined by Mr. Barbero

1 invite Mr. Hebert, Mr. Person, and Ms. Noble to provide
2 an opening statement with respect to this topic.

3 Sir, I can advise that the statement has been
4 provided to counsel and the Board and can be found at
5 Exhibit 380.

6 Mr. Hebert.

7 **A. MR. HEBERT:** Thank you, Mr. Barbero. Good
8 afternoon, Mr. Chair, members of the Board, Board
9 staff, Board counsel, members of other parties, and
10 members of the public watching this afternoon on
11 YouTube.

12 Alberta Transportation is aware of the
13 communities' concerns regarding air quality, human
14 health, vegetation and impacts to wildlife and
15 biodiversity, and takes these considerations very
16 seriously.

17 Alberta Transportation has worked to assess these
18 impacts so as to ensure that a clear and robust
19 understanding of each is achieved.

20 As discussed in my Topic 4 remarks on Monday,
21 Topic 5 also focuses on environmental impacts and
22 mitigation. And it is important to emphasize the
23 approach taken by Transportation in the assessment of
24 SR1.

25 The environmental assessment process addresses

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Examined by Mr. Barbero

1 both project-related and cumulative environmental
2 effects and follows a standardized framework for each
3 valued component.

4 While I will not repeat all those steps today, the
5 approach comprehensively assesses impacts, considers
6 and confirms mitigations that respond to the
7 significance of the impact, and outlines monitoring
8 efforts that support potential responses.

9 Transportation's environmental assessment process
10 includes engagement with stakeholders and Indigenous
11 groups to inform the development of mitigation and
12 monitoring plans. This includes a commitment to a
13 community liaison to ensure that impacts felt by the
14 community can be raised and dealt with by
15 Transportation or, later, Environment and Parks through
16 the life of the project.

17 Transportation is confident that the work
18 undertaken to date has resulted in a complete and
19 detailed assessment of these issues, and Transportation
20 acknowledges that monitoring and active mitigation
21 measures may be required to ensure the concerns of
22 local residents, Indigenous groups and other
23 stakeholders are properly assessed and, as needed,
24 mitigated.

25 In a moment, I will ask Mr. Person and Ms. Noble

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1 with Stantec to speak to the issues of air quality and
2 human health respectively; however, I would like to
3 take this opportunity to speak to some important
4 matters and considerations that have been advanced by
5 the Stoney Nakoda Nation and others under the topics of
6 wildlife and vegetation.

7 We have heard concerns raised by the elders of the
8 Stoney Nakoda Nation on Thursday, and during our
9 consultation prior to the hearing, in relation to the
10 movement of elk in the area of the project site.

11 The Stoney Nakoda have asked that we consider
12 construction of a wildlife overpass as a means of
13 ensuring the uninhibited movement of elk between the
14 lands on the east and west of Highway 22.

15 Transportation has considered this issue in detail
16 and previously discussed with the Stoney Nakoda Nation
17 their view that an overpass over Highway 22 is needed
18 to reduce animal-vehicle collisions and maintain
19 wildlife movement.

20 Although Transportation acknowledges that a
21 wildlife crossing structure, such as an overpass, can
22 be beneficial to reduce animal-vehicle collisions and
23 to facilitate wildlife movement, Highway 22 is a
24 designated highway within the province's high load
25 corridor network which must be able to have the

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Examined by Mr. Barbero

1 overhead utility lines raised to accommodate loads up
2 to 9 metres high.

3 The clearance height requirement of 9 metres
4 within the high load corridor coupled with the wildlife
5 overpass on top, would make a wildlife overpass an
6 extremely large structure and presents a feasibility
7 constraint related to the construction.

8 Moreover, it is important to recognize the
9 potential animal-vehicle collisions on Highway 22 are
10 related to existing conditions in the area and will not
11 be the direct effect of constructing the project.
12 Nonetheless, Alberta Transportation has incorporated
13 design features into the Highway 22 bridge over the
14 diversion channel to facilitate wildlife movement,
15 including open span dimensions of 10 metres height by
16 24 metres width, and a vegetated channel bottom.

17 This open-span bridge or underpass will provide
18 suitable conditions for ungulates, such as elk and deer
19 as well as other wildlife, to cross, based on
20 recognized practices in previously reported wildlife
21 use of large underpasses.

22 The effectiveness of the underpass to facilitate
23 wildlife movement will be monitored as part of the
24 remote camera monitoring program discussed in the draft
25 wildlife mitigation and monitoring plan.

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Examined by Mr. Barbero

1 I would like to take this opportunity to address
2 the work Transportation will do in a post-flood
3 scenario to address sediment and deposition.

4 I recognize that the surrounding community is very
5 concerned with the potential impacts of dust generated
6 following the operation of the project, and I will
7 outline Transportation's proposed response.
8 Ultimately, monitoring and adaptive management will be
9 key.

10 The primary monitoring related to management of
11 post-flood sediment are air monitoring, revegetation
12 monitoring, and soil monitoring.

13 Transportation will conduct ambient monitoring
14 after a flood event to monitor potential effects
15 associated with windblown sediment. Monitoring for TSP
16 and PM 2.5 at a location near the east PDA boundary
17 will be conducted for 16 months after a flood event;
18 that is, from the time of the flood event ending to the
19 end of the fall season the following year.

20 The ambient air quality monitoring location will
21 be determined post-flood once sediment deposition areas
22 are visible.

23 Importantly, whether it is necessary to employ
24 monitoring longer than 16 months will be determined in
25 consultation with stakeholders and regulatory agencies.

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1 Further, it is important to identify the goals for
2 sediment management and revegetation. And
3 Transportation has four specific goals in this regard:
4 First, safety and operations; second, erosion control;
5 third, weed control; and finally, revegetation. These
6 are outlined in the environmental impact assessment at
7 Exhibit 20 and elsewhere in the materials, such as
8 erosion control measures discussed in the response to
9 Round 1 NRCB supplemental information request at
10 Exhibit 94.

11 Efforts related to the activities to meet these
12 goals are linked to the amount of sediment deposited in
13 the reservoir.

14 Alberta Environment and Parks, as operator, will
15 commence work on air monitoring and Goals 1 and 2 at
16 the first available opportunity post-flood release.

17 It is important to note that the time periods
18 described below are estimates only, and the steps
19 associated with each time period will be advanced at a
20 pace needed to manage the site. In other words, should
21 some of the steps need to be implemented sooner, that
22 will be done.

23 Specifically, within two weeks of a post-flood
24 release, the following steps will be implemented.
25 There are four: One, surveys of the area will be

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Examined by Mr. Barbero

1 undertaken to assess for trafficability.

2 Given the nature of the surface in a post-flood
3 release scenario, one or more combination of tracked
4 equipment, rig matting, geocell installation, or other
5 tools, may be required to ensure access.

6 Two, surveys of the area will be undertaken to
7 assess for signs of wind erosion or weeds, and each
8 will be responded to as needed. Survey efforts for
9 these items will continue with regularity at no less
10 than two-week intervals.

11 Three, evaluation will be made of the area for
12 soil moisture to determine if a cover crop can be sown,
13 including consideration for the application of such
14 items such as compost or biochar, as required, to
15 ensure viability of the cover crop.

16 And, finally, the fourth item. If certain areas
17 of erosion risks are identified and conditions are
18 considered unsuitable for revegetation, alternative
19 erosion control methods will be instituted, including
20 application of tackifier.

21 Efforts in furtherance of Goals 3 and 4 will
22 commence shortly thereafter and, in any event, no later
23 than between Weeks 2 and 4 post-flood release.

24 These activities will be conducted at the same
25 time and in association with the efforts discussed in

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1 relation to Goals 1 and 2.

2 By the Week 4 mark, sediment is expected to be dry
3 and, therefore, more prone to wind erosion. At this
4 point, ongoing survey work will be undertaken for any
5 signs of wind erosion, and to assess the status of
6 cover crop growth, natural revegetation, and the
7 presence of weeds.

8 Any efforts needed to help bolster cover crop will
9 be undertaken, as will efforts to assist natural
10 regrowth. If weeds are detected and found to be above
11 acceptable targets, response options will be considered
12 and applied.

13 Work will continue at six weeks post-flood
14 release, including ongoing survey of areas for signs of
15 wind erosion, cover crop growth, natural revegetation,
16 and the presence of weeds.

17 Any areas of concern, whether it be in relation to
18 erosion, growth, or weeds, will be immediately and
19 properly addressed through either further application
20 of tackifiers, reapplication of cover crop, or other
21 appropriate methods.

22 By eight weeks post-flood release, it is
23 anticipated there will be very few areas prone to wind
24 erosion or where cover crop has not grown. However,
25 should there continue to be areas of concern,

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1 intensified mitigation efforts are available and will
2 be implemented. For example, application of
3 hydroseeding or use of additional tackifier are options
4 that can be implemented.

5 Ongoing application and monitoring of wind erosion
6 and revegetation will occur over winter months as
7 needed and appropriate. By the following year, likely
8 April or May, work will again intensify with ongoing
9 efforts to survey and identify areas of wind erosion,
10 assessing the status of crop growth, assessing the
11 actual revegetation and monitoring for the presence of
12 weeds.

13 The various measures that have already been spoken
14 of above, such as hydroseeding or application of
15 tackifier, can be re-implemented and used if necessary.

16 The sediment management approach described above
17 will be continued as needed until revegetation is
18 successful.

19 Transportation is prepared to consider the
20 addition of shelter belts at select areas of the PDA or
21 at the request of adjacent landowners.

22 I will reemphasize that AT recognizes the concerns
23 of the potential impacts in relation to post-flood
24 sediment, and that AT will undertake the work required
25 to minimize these risks.

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Examined by Mr. Barbero

1 The issue of weeds in the periods both post-flood
2 release and between flood events has been raised. I
3 would like to say a few words about weed control, as it
4 will be an important aspect of revegetation activities.

5 A comprehensive weed management plan will be
6 prepared prior to construction. Weed control, at a
7 minimum, will follow the *Alberta Weed Control Act*
8 regulations, and prohibited weeds will be removed and
9 noxious weeds controlled.

10 Transportation and the operator AEP will work with
11 Rocky View County on identified suitable weed control
12 measures and acceptable noxious weed levels for
13 inclusion in the vegetation and wetland mitigation
14 monitoring and revegetation plan.

15 Details on the proposed weed control program are
16 presented in Section 7.5 of the draft vegetation
17 wetland mitigation monitoring and revegetation plan at
18 Exhibit 124.

19 I now invite Mr. Person to provide his remarks.

20 MR. BARBERO: Mr. Chair, it's Michael Barbero
21 here.

22 As mentioned, Mr. Person has a PowerPoint
23 presentation.

24 Document manager, if we could please bring that
25 up.

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Examined by Mr. Barbero

1 A. MR. PERSON: Good morning. My name is
2 Reid Person. I am a principal and technical leader for
3 air quality with Stantec, and I've been actively
4 involved in this project on behalf of Alberta
5 Transportation since 2016.

6 I was involved in conducting the initial air
7 quality modelling that is discussed in the
8 environmental impact assessment that has been filed.

9 I have also reviewed the report prepared by
10 Dr. Zelt on behalf of the SCLG and have sought to
11 address his comments in my responding technical
12 memorandum, which has been filed as part of this
13 proceeding as Appendix I to Exhibit 327.

14 I would like to take this opportunity to briefly
15 speak to the technical memorandum. As with any
16 modelling exercise, there are always challenges in
17 quantifying and representing real-world conditions that
18 are anticipated to exist at a moment in time. This is
19 particularly true in the case of a project like this
20 which will be operated very infrequently.
21 Consequently, uncertainties are inherent in the
22 modelling just as uncertainties are inherent in the
23 modelling undertaken by Dr. Zelt.

24 In an effort to account for uncertainties, a
25 number of conservative assumptions are used. These

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1 conservativisms have the intended effect of creating a
2 more robust model and analysis but one which also tends
3 to overpredict modelled scenarios.

4 As a further means of accounting for uncertainties
5 and ensuring that modelling presents a fulsome picture
6 of what may be expected in relation to a project, a
7 number of sensitivities were conducted. The
8 sensitivities evaluated included considering the effect
9 of the size of sediment and sediment particled size
10 distribution on model predictions. In short, the
11 objective of these sensitivities is to modify certain
12 parameters so as to better understand the implications
13 to air quality should predicted events occur.

14 For example, one of the criteria that was selected
15 and deselected in various sensitivities outlined in the
16 attached memorandum was the nature of the sediment
17 particles that are anticipated. In certain of the
18 sensitivities, the particles were considered to be more
19 coarse, while in other sensitivities, the particles
20 were considered to be finer. This is an example of how
21 the model can be modified to provide a further level of
22 understanding or nuance to the issue.

23 MR. BARBERO: Mr. Person, Mr. Chair, my
24 apologies for interrupting. I have not seen the slides
25 advance. I'm not sure if --

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1 **A. MR. PERSON:** We're not at the slides yet

2 Mr. Barbero.

3 **MR. BARBERO:** My apologies.

4 **MR. SECORD:** I think he's reading from

5 Exhibit 380.

6 **A. MR. PERSON:** We're almost there.

7 **THE CHAIR:** You wanted the slide presentation

8 left for now then?

9 **A. MR. PERSON:** It can stay up.

10 **THE CHAIR:** Okay, good, thank you. Thank you,

11 Mr. Barbero.

12 **A. MR. PERSON:** As is set out in the environmental
13 impact assessment, and more specifically, in the
14 technical memorandum, our revised sensitivities and
15 modelling do indicate the potential for exceedances of
16 air quality standards on a limited basis and in
17 specific circumstances.

18 As is further discussed in our environmental
19 impact assessment and technical memorandum, the story
20 does not end with the modelling. Rather, it is
21 important to note that the monitoring will be conducted
22 and, as needed, mitigation employed to address any
23 exceedances.

24 At this time, I would like to take you to a
25 PowerPoint presentation that I have prepared to help

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1 simplify the issues and the conclusions reached.

2 Good morning. This presentation provides an
3 overview of information submitted in the environmental
4 impact assessment and the March 12th reply submission,
5 included responding to some of the comments provided by
6 the SLG (verbatim).

7 As stated, I will present an overview of the
8 post-flood windblown dust assessment that addresses the
9 fundamentals of dust emissions, the key assumptions,
10 prediction bias, model results, monitoring and
11 mitigation, and the overall assessment conclusions.

12 Next slide.

13 Fugitive dust occurs through a complex physical
14 process controlled by wind speed, soil characteristics,
15 surface roughness, vegetation and frequency or time
16 since disturbance of the soil.

17 Now soil texture and structure are important as
18 they describe the relative size and proportion of the
19 different sized mineral particles and how they combine
20 or adhere into aggregates. Soil moisture is important
21 as it increases soil cohesion and resistance to wind
22 erosion. And fugitive dust occurs when there is a
23 strong enough wind, a susceptible soil surface, and a
24 lack of surface protection by vegetation or other
25 roughness elements on the soil.

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1 Next slide.

2 Soil texture is an important controlling variable
3 for estimating fugitive dust emissions. Sandy soils
4 tend to be most susceptible to wind erosion while finer
5 textured soils tend to be more resistance to wind
6 erosion. Soils with a greater amount of fine grain
7 sizes, while they have a greater reservoir of finer
8 particles that are potential source of fugitive dust,
9 are in fact more resistant to wind erosion, and the
10 texture properties of soils is an important input into
11 fugitive dust emissions.

12 However, it is important to realize that the
13 relationship between soil texture and emission rate is
14 complex, resulting in considerable uncertainty in the
15 estimate of fugitive dust emission rates.

16 Next slide.

17 Now, wind provides the driving force to initiate
18 and control fugitive dust emissions. As wind moves
19 over the ground, the surface exerts a drag force upon
20 the moving air, resulting in the vertical wind speed
21 profile shown in this figure. In simple terms, wind
22 speeds are lower close to the ground and higher further
23 above the ground, and this drag force or shear force is
24 expressed as the friction velocity or what we call u^* .

25 Now, the roughness of the surface is described by

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1 what is called the "surface roughness length" or " Z_0 "
2 or "Z nought" on the figure.

3 Next slide.

4 Surface roughness is important as it controls
5 which areas or types of surfaces have higher or lower
6 wind erosion risk. Surface roughness is also one of
7 the variables that affects friction velocity. Surfaces
8 with low roughness lengths such as those that are
9 relatively flat and unvegetated exert a weak drag force
10 on the moving air, which allows for faster near-surface
11 wind speeds.

12 Low roughness surfaces are susceptible to wind
13 erosion, and surfaces that are rougher, such as those
14 with vegetation, exert a stronger drag force and reduce
15 wind speeds along the surface. High roughness surfaces
16 are much less susceptible to wind erosion.

17 This is why we have modelled dust from the
18 sediment areas with deeper sediment which are expected
19 to cover vegetation, and this is why we have not
20 modelled dust emissions from the entire reservoir where
21 we expect vegetation to not be materially affected.

22 This surface roughness versus wind erosion
23 relationship was shown in Figure 3.1 of Exhibit 67 of
24 the EIA at PDF page 376. We don't need to look at the
25 figure; I'm just mentioning that for the record.

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1 Next slide.

2 In case you're wondering why I'm subjecting you to
3 an overview of meteorology and physics, it's because
4 the ENVIRON/RMC method that was used to calculate dust
5 emissions is controlled by surface roughness and
6 friction velocity. And when friction velocity exceeds
7 what is called the threshold friction velocity which we
8 show as the leftmost blue line on the figure, that's
9 when fugitive dust emissions start.

10 Emissions then increase exponentially as a
11 function of increasing friction velocity. This
12 emission method includes separate emission equations
13 for different soil textures. In the post-flood
14 assessment, emissions have been calculated using
15 equations for silty sand and sandy silt.

16 Now, this surface roughness length has been a
17 point of disagreement with the SCLG's air quality
18 expert, and I'll explain why Alberta Transportation's
19 assumption is reasonable and where I think SCLG's air
20 quality expert has erred.

21 Surface roughness length can be defined in
22 different ways depending on how it's used.
23 Specifically there are important differences in how it
24 should be defined spatially when used as an input to a
25 dust emission calculation versus when it's used as

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1 input to a meteorological model. The surface roughness
2 length value uses input to a fugitive dust emission
3 calculation should be the microscale soil surface
4 roughness length.

5 Now, this is because this value is used to
6 describe the transfer of energy from the wind to the
7 individual soil particles that govern the initiation of
8 dust emissions. This is what Alberta Transportation
9 has done, and that's described in detail in our
10 March 12th reply submission.

11 Now, SCLG has not followed this approach and
12 rather has applied a larger macroscale roughness length
13 appropriate as input to a meteorological model. This
14 macroscale surface roughness length describes the
15 roughness properties averaged over a larger
16 surface -- or larger surface area or distance. Use of
17 a macroscale roughness length is not appropriate for
18 the fugitive dust emission calculation and results in
19 an overestimation of emissions.

20 Next slide.

21 So another one of the important assumptions in the
22 model is estimating the fraction of total particulate
23 matter that's composed or comprised of the more
24 important smaller particles, specifically what we call
25 PM 2.5 or particles with an aerodynamic diameter less

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1 than 2.5 microns.

2 Alberta Transportation adopted a PM 2.5 to TSP
3 ratio of 0.075 or 7.5 percent, and that was based upon
4 conventional US EPA emission inventory guidance for
5 wind erosion.

6 Now, SCLG has argued that this is not appropriate,
7 and specifically, SCLG has argued that this factor is
8 only representative of an industrial worksite.

9 Mr. Chairman, that's not correct. The US EPA guideline
10 and the references cited in that guideline clearly
11 indicate that the factor is in fact representative of
12 open area wind erosion emission sources for a variety
13 of different soil types and also representative of the
14 ratio measured in dust concentrations over a dry lake
15 bed. So Alberta Transportation has followed an
16 acceptable approach.

17 Next slide.

18 So in summary, Alberta Transportation has modelled
19 dusts from the sediment areas with sediment depth
20 greater than 10 centimetres to represent areas where
21 sediment is at risk of erosion, and Alberta
22 Transportation has adopted a surface roughness length
23 in the calculation that is appropriate for quantifying
24 fugitive dust emissions. And these are both realistic
25 assumptions.

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1 Next slide.

2 Mr. Chairman, SCLG's assumptions result in an
3 overprediction bias. Now, to demonstrate, I have
4 provided a table that compares the calculated fugitive
5 dust emission rates using the assumptions adopted by
6 Alberta Transportation in the first column to the
7 assumptions adopted by SCLG in the second column at a
8 hypothetical or example wind speed of 40 kilometres per
9 hour. The percent difference in calculated emissions
10 is shown in the last column.

11 Now, what this tells us is the SCLG assumptions
12 result in TSP emissions that are more than 140 percent
13 larger than Alberta Transportation, but much more
14 significantly, the SCLG assumptions result in PM 2.5
15 emissions that are more than 640 percent larger than
16 Alberta Transportation.

17 So SCLG has adopted unconventional and
18 non-guideline assumptions that result in significant
19 overprediction bias.

20 Next slide.

21 So, in addition to the aspects of methodology
22 we've just discussed, you know, it is important to
23 understand that the post-flood dust assessment
24 incorporates a number of other conservative
25 assumptions. These include assessing high magnitude,

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1 low-recurrence flood events, such as the design in 1 in
2 100 floods; using sediment areas and texture estimates
3 from the late release scenario; not accounting for the
4 natural dust control benefit of rainfall; assuming
5 sediment consists of a disturbed sediment surface
6 rather than a more erosion-resistant, crusted or aged
7 surface; and, lastly, not accounting for the influence
8 of the dam structure which sits between the sediment
9 and nearby receptors.

10 Next slide.

11 Mr. Chairman, assessing air quality effects
12 associated with fugitive dust is challenging. The
13 sediment properties change over time and meteorology is
14 variable. There is uncertainty in terms of the
15 estimates of sediment area, texture, and uncertainty
16 with the emission estimation methods themselves.

17 So, in the context of this uncertainty, the
18 post-flood dust assessment evaluated four different
19 scenarios as a sensitivity analysis to consider a range
20 of scenarios with both smaller and larger sediment
21 areas and sediment textures containing higher and lower
22 quantities of finer or fine sediment.

23 The results for all four of these cases are
24 detailed in the March 12th reply submission. However,
25 for this presentation, I've circled Cases 1 and 4 on

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1 this figure, as these two cases represent the ones with
2 the highest and lowest predicted air quality impacts
3 respectively.

4 Model predictions for Case 1 and 4 will be
5 presented on the next few slides to summarize the
6 impacts on air quality and the sensitivity of the model
7 predictions to these different assumptions.

8 Next slide.

9 The two figures on this slide represent maximum
10 predicted one-hour PM 2.5 concentrations for the
11 application case and for the design flood.

12 The application case means that it represents
13 emissions from the project, combined with emissions
14 that are already in the existing study area.

15 The Case 1 figure, which represents the smaller
16 sediment area and more coarse sediment, is shown in the
17 left pane, and indicates maximum one-hour average PM
18 2.5 concentrations are less than the Alberta ambient
19 air quality guideline throughout the entire study area.

20 The Case 4 figure on the right pane represents the
21 scenario with a larger sediment area and more fine
22 sediment. This figure shows higher predicted PM 2.5
23 concentrations and indicates the potential for maximum
24 one-hour concentrations to exceed the Alberta guideline
25 in an area adjacent to the PDA.

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1 The area with predicted concentrations that exceed
2 the guideline extends to approximately less than 1
3 kilometre from the PDA.

4 In both figures, the overall maximum predicted
5 concentration occurs on the PDA boundary and decreases
6 as you move away from the PDA.

7 Next slide.

8 Now, when a maximum predicted concentration is
9 greater than an air quality objective or a guideline,
10 one of the important metrics to consider is the
11 frequency or likelihood of an exceedance to occur and
12 how that likelihood varies spatially over a study area.

13 In the context of the one-hour PM 2.5 predictions
14 for Case 4, the predicted frequency results indicate a
15 maximum probability occurrence on the east side of the
16 PDA boundary, and the predicted frequency of occurrence
17 or probability of an exceedance decreases appreciably
18 as you move further away from the PDA boundary.

19 The contour lines shown in this figure represent
20 different levels of likelihood or probability of
21 occurrence. The outermost three contour lines for
22 context represent one-hour, three hours and ten hours
23 of predicted exceedance in a single year following a
24 design flood.

25 Next slide.

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1 Similar to the one-hour figures, these two figures
2 on the slide represent the maximum predicted 24-hour PM
3 2.5 concentrations, again, for the application case,
4 and, again, for the design flood.

5 The Case 1 figure on the left pane indicates
6 maximum predicted 24-hour concentrations are
7 approximately equal to the air quality objective right
8 on the PDA boundary but are below the objective beyond
9 the boundary.

10 The Case 4 figure on the right pane shows higher
11 predicted PM 2.5 concentrations and indicates the
12 potential for maximum 24-hour concentrations to exceed
13 Alberta's air quality objective in an area that's
14 generally to the east of the PDA and extends out to a
15 little less than 5 kilometres from the PDA boundary.

16 In both figures, again, the overall maximum
17 predicted concentrations occur on the project boundary
18 and decrease as you move away from the PDA.

19 Next slide.

20 Again, it's important to consider the frequency or
21 likelihood of exceeding the air quality objective, and
22 that's what's shown in this figure.

23 In the context of 24-hour predictions for Case 4,
24 the predicted frequency results indicate a maximum
25 probability of occurrence in exceedance that occurs on

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1 the PDA boundary.

2 And, again, the contour lines indicate different
3 levels of probability or likelihood of exceedance with
4 the outermost -- outer three most contour lines on the
5 figures representing one day, two days, and three days
6 of predicted exceedance in a single year following a
7 design flood.

8 Next slide. Despite the uncertainties associated
9 with the fugitive dust modelling, what the air quality
10 model results do tell us is that fugitive dust has the
11 potential to impact air quality and that mitigation
12 monitoring and adaptive management are important to
13 ensuring that there are not unacceptable impacts, and
14 to this point, Alberta Transportation has committed to
15 implementing mitigation to achieve vegetation and
16 control dust. There are a wide variety of effective
17 methods available to control dust.

18 Alberta Transportation has committed to ambient
19 air quality monitoring near the PDA following a flood,
20 to measure impacts on air quality, and Alberta
21 Transportation has committed to adaptive management and
22 the implementation of additional mitigation as
23 necessary if excessive TSP or PM 2.5 concentrations are
24 measured.

25 Next slide.

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1 So, in conclusion, based upon the low recurrence
2 of significant floods, infrequent, and localized risk
3 of elevated particulate matter concentrations, a
4 commitment to implement mitigation, air monitoring and
5 adaptive management, the overall conclusion of the
6 assessment is that post-flood, fugitive dust emissions
7 are not anticipated to have significant adverse effects
8 on ambient air quality.

9 Thank you.

10 MR. BARBERO: Thank you, Mr. Person, and my
11 apologies for interrupting you there.

12 I believe, Ms. Noble, do you have some remarks to
13 make as well?

14 A. MS. NOBLE: Yes. Thank you.

15 MR. BARBERO: Document manager, I suggest
16 perhaps we should take down the PowerPoint. Thank you.

17 A. MS. NOBLE: My name is Tania Noble. I'm a
18 human health risk assessment specialist with Stantec.

19 I've been involved with this project since 2014.
20 I was also involved in the preparation of the
21 environmental impact assessment, Section 15 entitled
22 "Public Health."

23 As part of my work with this project, I have had
24 the opportunity to review the air modelling that was
25 prepared in 2017, and to look at the most recent

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1 sensitivities that, as Reid has commented, are set out
2 in the technical memorandum. Consequently, I have
3 provided additional comment and analysis, which is also
4 found in the technical memorandum at Section 3.

5 As noted by Reid, the modelling and sensitivities,
6 in certain circumstances, do identify potential
7 exceedances of air quality standards. However, an
8 exceedance of an air quality standard or objective, in
9 and of itself, does not necessarily give rise to a
10 human health concern.

11 Ultimately, it's important to keep in mind that
12 when speaking of possible air quality concerns
13 associated with the project, modelled exceedances of
14 air quality standard or objective are expected to be
15 infrequent, and short in duration as, we know,
16 operation of the project is itself an infrequent
17 occurrence. The meteorological events and conditions
18 that would give rise to air quality concerns are also
19 likely to be infrequent occurrences.

20 Furthermore, there are proven and effective dust
21 control methods that, when properly applied, can
22 control fugitive dust with a high degree of
23 effectiveness and improve air quality to a point where
24 it meets air quality standards.

25 Taken together, these considerations, duration,

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1 frequency, adaptive mitigation, coupled with the
2 proposed monitoring that will guide the adaptive
3 mitigation measures, leads me to have a high degree of
4 confidence that potential effects to human health are
5 not significant.

6 I will now invite Mr. Hebert to make further
7 comment.

8 A. MR. HEBERT: Thank you, Mr. Person, Ms. Noble.

9 As I previously stated, ultimately monitoring and
10 adaptive management will be key, with the primary
11 monitoring, related to management of post-flood
12 sediment, are air monitoring, revegetation monitoring
13 and soil monitoring.

14 On the issue of monitoring, there have been a
15 number of statements suggesting that Alberta
16 Transportation is simply relying on future monitoring
17 to mitigate the effects of SR1.

18 In fact, where adverse effects have been predicted
19 in the EIA, Transportation has identified specific
20 measures to proactively mitigate those effects. Draft
21 monitoring programs have been developed for several
22 valued components to verify the effectiveness of
23 planned mitigation measures, and to allow for continued
24 improvement through adaptive management. Monitoring
25 programs are an important tool to reduce uncertainty in

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1 outcomes. Monitoring also allows for response to
2 actual as opposed to assumed events. Transportation
3 has advanced a number of monitoring plans and is
4 committed to finalizing them with input from regulators
5 and stakeholders.

6 Additionally, and, as mentioned, a community
7 liaison will serve as a point of contact with
8 stakeholders and be able to provide interested parties
9 information on air quality monitoring results as
10 requested and to raise concerns with the project's
11 environmental impacts. As I've previously stated,
12 Transportation continues to be quite open to meeting
13 and discussing concerns about the project with adjacent
14 landowners. Alberta Transportation and Environment and
15 Parks will implement the community liaison role during
16 project construction and operations, respectively.

17 In closing, Transportation, once again,
18 acknowledges the concerns raised in relation to these
19 very important issues. Transportation is committed to
20 constructing and operating the project in a manner that
21 prevents impacts, to ensuring the same, through robust
22 and expansive monitoring, and, when necessary, through
23 use of well-established and proven mitigation measures.

24 Transportation's commitment to this is not limited
25 to project construction, but rather, is a commitment

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1 for the entirety of the project's operational lifespan.

2 Mr. Chairman, before I conclude, this is

3 Transportation's final opening statement.

4 On behalf of the Transportation witness panel, I

5 want to thank and acknowledge the professionalism of

6 the Board's support staff, the court reporters, the

7 Zoom manager and document manager. Appreciating this

8 is a hearing under fairly unique circumstances, I'd say

9 99.9 percent of the time has gone very well, so we

10 appreciate that.

11 On that note, Mr. Chairman, that concludes my

12 remarks.

13 THE CHAIR: Thank you, Mr. Hebert. And I know

14 that our staff and all the support staff will

15 appreciate those comments, so thank you very much.

16 MR. BARBERO: Mr. Chair, I see we've tipped over

17 the one hour by a few minutes. We will adjust our

18 cross accordingly, sir, I promise.

19 And with that, sir --

20 THE CHAIR: You were pretty close.

21 MR. BARBERO: With that, sir, that concludes the

22 direct evidence of Alberta Transportation on Topic 5,

23 air, human health and terrestrial.

24 Sir, this panel is now available for

25 cross-examination.

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1 THE CHAIR: Thank you, Mr. Barbero.

2 MR. SECORD: Mr. Chair, we should mark that
3 PowerPoint as an exhibit.

4 THE CHAIR: I was just ready to do that,
5 Mr. Secord. Thank you.

6 I was just going to ask if that hasn't been marked
7 as an exhibit, we ought to do that, so.

8 MS. FRIEND: So this is Laura Friend. The next
9 number would be 392, and that's the Reid Person
10 PowerPoint.

11 THE CHAIR: Yes, thank you.

12 **EXHIBIT 392 - REID PERSON POWERPOINT**

13 THE CHAIR: Thanks, Mr. Secord.

14 Calgary River Community Action Group. Mr. Cusano,
15 any questions for this panel?

16 MR. CUSANO: No questions, thank you, sir.

17 THE CHAIR: Thank you. Mr. Mercer, City of
18 Calgary?

19 MR. MERCER: No questions from the City of
20 Calgary at this time, sir.

21 THE CHAIR: Thank you.

22 Ms. Louden -- I think it's still Ms. Louden with
23 Stoney Nakoda, do you have some questions?

24 MS. LOUDEN: Good afternoon, Mr. Chairman.

25 Yes, this is Sara Louden. We do have a couple of

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1 questions for this panel.

2 **MS. LOUDEN CROSS-EXAMINES THE PANEL:**

3 Q. I propose to proceed sort of as we have done generally,
4 just ask the question to the panel broadly, and you all
5 can determine who is best suited to respond.

6 Is it correct that to date, Alberta has not built
7 any overpasses over provincial highways and that the
8 intent is to build the first such overpass over
9 Highway 1 east of Canmore?

10 A. MR. HEBERT: Mr. Chairman, Mr. Svenson will
11 provide a response.

12 A. MR. SVENSON: Good afternoon, Mr. Chair. This
13 is Mark Svenson speaking.

14 While I don't know the specifics, I am aware that
15 yes, the province is looking to build an overpass over
16 Highway 1.

17 Q. And why does Alberta Transportation consider an
18 overpass appropriate over Highway 1, but not
19 appropriate over Highway 22?

20 A. MR. SVENSON: I believe Mr. Hebert discussed
21 that during his direct, in that some of the
22 circumstances along Highway 22, including the high load
23 corridor, preclude a wildlife overpass from being a
24 feasible option, and we also consider other options for
25 wildlife passage, including underpasses, as feasible.

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1 Q. So I take it, then, based on your reference to the high
2 load corridor network, that Highway 1 is not designated
3 as a high load corridor roadway; is that correct?

4 A. MR. SVENSON: I can't confirm if all areas of
5 Highway 1 are not considered the high load corridor,
6 but the portion west of -- or towards Canmore, so west
7 of Calgary, is not considered in the high load
8 corridor.

9 Q. Is all of Highway 22 designated within the high load
10 corridor network; more specifically, is the segment of
11 Highway 22 between Highway 1 and Highway 8 currently
12 designated within the high load corridor network?

13 A. MR. SVENSON: Yes. That section of Highway 22
14 is designated as high load corridor.

15 Q. So I've recently had a look at the government of
16 Alberta's website regarding high load corridors, and
17 that segment of Highway 22 between Highway 1 and
18 Highway 8 specifically is not currently listed as a
19 route segment in service under the network.

20 I understand there was a proposal in 2018
21 regarding adding that particular section to the high
22 load corridor network. Are you able to provide any
23 insight as to why that may be?

24 A. MR. SVENSON: Just a minute, Mr. Chair.

25 A. MR. HEBERT: Mr. Chairman we'll undertake to

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1 provide that response through a formal undertaking.

2 UNDERTAKING - TO ADVISE WHY THERE WAS A
3 PROPOSAL IN 2018 REGARDING ADDING THE
4 SEGMENT OF HIGHWAY 22 BETWEEN HIGHWAY 1
5 AND HIGHWAY 8 TO THE HIGH LOAD CORRIDOR
6 NETWORK

7 Q. MS. LOUDEN: And if it is determined that it
8 has been added to the high load corridor network, if
9 you could also add in that undertaking when that
10 occurred.

11 A. MR. HEBERT: We'll add that component to the
12 question to the undertaking.

13 UNDERTAKING - IF IT IS DETERMINED THAT
14 THE SEGMENT OF HIGHWAY 22 BETWEEN
15 HIGHWAY 1 AND HIGHWAY 8 HAS BEEN ADDED
16 TO THE HIGH LOAD CORRIDOR NETWORK, TO
17 ADVISE WHEN THAT OCCURRED

18 MS. LOUDEN: Mr. Chair, if you could just give
19 me a moment to review my notes here.

20 THE CHAIR: Yes, please take a moment.

21 Q. MS. LOUDEN: Can you explain what the purpose
22 of a high load corridor is?

23 A. MR. SVENSON: Mr. Chair, this is Mark Svenson.

24 A high load corridor is a designated route for
25 oversized loads to make their way to different

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1 destinations within the province of Alberta.

2 Q. What is the east-west equivalent, I suppose, of the
3 high load corridor? Which route goes east-west for
4 that purpose?

5 A. MR. SVENSON: There are different sections of
6 highways throughout the province that run both
7 north-south and east-west that are designated under the
8 high load corridor. One such segment is Highway 14
9 east of Edmonton.

10 MS. LOUDEN: Mr. Chairman, I believe for now,
11 that concludes my questions.

12 THE CHAIR: Thank you, Ms. Louden. Thank you,
13 panel.

14 Mr. Secord, SCLG has a couple of questions for the
15 panel.

16 MR. SECORD: At least two, at least two.

17 I should, to give you a roadmap, my partner
18 Ms. Okoye will be asking Panel 5 questions about
19 vegetation, wildlife, and biodiversity. She tells me
20 that she thinks she has a couple hours of cross, and I
21 expect that will probably, with the afternoon break,
22 probably take up the balance of the afternoon.

23 Should she miraculously finish ahead of schedule,
24 then I will have questions for Mr. Person and for
25 Mr. Hebert relating to air quality, soils, and terrain.

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Cross-examined by Ms. Louden

1 I expect to have over an hour of questions,
2 perhaps more, depending, of course, on the answers I
3 get and whether the questions are answered the first
4 time or whether I have to repeat them three times makes
5 a difference.

6 So I expect, though, in any event, that I would
7 finish up on Thursday morning. And as I did mention to
8 you, I expect to have some questions on answers to
9 undertakings, so I would propose to do that as soon as
10 I finish up my regular questions.

11 And just a question in relation, I'm assuming
12 Mr. Wood is on the panel. He's a regular, so I think
13 there won't be any issue about -- about having the
14 right people there. So, that's the roadmap for this
15 afternoon.

16 THE CHAIR: Okay. So, Mr. Barbero, in terms
17 of splitting your panel into this afternoon and
18 tomorrow morning, that will present no challenges for
19 having your panel members here both this afternoon and
20 tomorrow morning?

21 MR. BARBERO: Yes, Mr. Chair, no issues. Our
22 panel is here today and tomorrow, sir.

23 THE CHAIR: Okay. So, Mr. Secord, sounds
24 good. And we can then -- I have a note here for us to
25 kind of clean up the documented undertakings. Perhaps

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1 sometime before noon tomorrow we can do that. We don't
2 have to time that, but as long as we get to that
3 tomorrow, of course.

4 And the floor is yours, Ms. Okoye.

5 MR. KRUHLAK: Sorry, Mr. Chairman, it's
6 Ron Kruhlak. Just before Mr. Secord commences, I just
7 wanted to perhaps propose that -- maybe see where we go
8 at the afternoon break, but it might be a possibility,
9 if the Panel is prepared to consider sitting longer
10 this afternoon, we endeavor to complete the cross by
11 SCLG, recognizing that perhaps we just come back in the
12 morning to -- with respect to undertakings. I think
13 we're planning to try to provide Mr. Secord with the
14 balance of the undertakings later today. So that might
15 be a target.

16 It may be premature to float it more formally
17 right now, depending on how, as Mr. Secord says, things
18 unroll. But I at least wanted to raise that now, and
19 perhaps we can consider whether it has merit at the
20 midafternoon break.

21 THE CHAIR: At the break, sure.

22 MR. SECORD: I would just like to say one thing
23 on that, and I am firmly opposed to sitting after 5:00.
24 I have found the hearing schedule from 8:30 to 5 very
25 challenging and exhausting. Quite frankly, I don't

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1 know how the four Board Panel members can absorb all of
2 the information that comes in over such an extended
3 period of time. So I would say in -- under no
4 uncertain circumstances am I prepared to sit beyond 5
5 tonight.

6 And in terms of tomorrow, there is a small agenda
7 tomorrow. We have my friends, the Stoney Nakoda, with
8 apparently half an hour of examination in chief, and I
9 note we might hear from Ms. Louden on that. But
10 generally speaking, you know, that is not a big time
11 factor.

12 And then the only other issue is the SCLG Panel 5,
13 that is scheduled to be an hour. So we have maybe hour
14 and a half of examination in chief, perhaps Mr. Wagner
15 has five minutes.

16 So I think, I just don't see any issue with
17 finishing in a reasonable time tomorrow, and I see no
18 need to extend the sitting hours beyond 5:00 this
19 afternoon.

20 THE CHAIR: Well, let's see where we're at. I
21 mean we will be -- if we went even till -- well, okay,
22 so 5:30 would give us two hours, plus a little bit, but
23 we'll have a break. You would need -- you had about
24 four hours, just over four hours, Mr. Secord, so that
25 would take us to at least 10:00 tomorrow and then your

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1 examination, your direct. And Transportation has
2 slotted 300 minutes, so that's well over -- that's
3 about 5 hours.

4 Now, I don't know. Do we expect them -- I mean,
5 we should hear from Transportation, but it would be
6 good to -- if we're going to break until Tuesday, we
7 could hold some over to the next week and then have
8 finals, but it would be nice to finish up tomorrow for
9 sure.

10 MR. SECORD: Yeah, I don't think --
11 Transportation has never used their allocations up, and
12 I can't imagine they have 300 minutes of cross. But
13 I'm sure Mr. Kruhlak -- if we do have 300 minutes of
14 cross from AT, I would be very surprised.

15 MR. WILLIAMS: Mr. Chairman, if I could
16 interrupt. It's Bob from Calalta. We will have some
17 cross questions for Alberta Transportation on Area
18 Topic 5.

19 THE CHAIR: And how long are you looking for,
20 Mr. Williams?

21 MR. WILLIAMS: Probably ten minutes.

22 THE CHAIR: Okay. Thank you.

23 Mr. Kruhlak?

24 MR. KRULHAK: Well, Mr. Chairman, I appreciate
25 Mr. Secord's comments, but I trust this rests with the

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1 Board's decision for you to make when you see how the
2 afternoon unfolds.

3 We will probably not be using our entire time, but
4 I still remain concerned about -- I think it's probably
5 in all parties' interests to see if -- to ensure the
6 matter can try to be concluded on the evidentiary side
7 by the end of day tomorrow.

8 So with that, I'm quite prepared to see where we
9 stand at the mid-break.

10 THE CHAIR: Thank you, Mr. Kruhlak, and we are
11 committed to concluding by close of day tomorrow. And
12 Mr. Secord, that might mean a later day tomorrow, if
13 necessary. But Mr. Kennedy?

14 MR. KENNEDY: I was simply going to say, it's
15 the Panel is the best judge of whether it's capable of
16 working through long days of evidence, and it is common
17 practice for the Board to extend its days where
18 appropriate. I think Mr. Secord has been involved in
19 many proceedings that have gone into, frankly, the late
20 evening hours, and these hearings have turned out to be
21 productive for the Panel and productive for the
22 participants.

23 So perhaps when we revisit it in the afternoon,
24 we'll have a better idea as to where SCLG is in its
25 cross, and we might spend five minutes just kind of

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1 running out the time forward so that we can complete
2 the evidentiary portion of the record by end of day
3 tomorrow.

4 THE CHAIR: Yes, I can -- Mr. Kennedy, thank
5 you. I can assure you that the Panel meets at the end
6 of each day and we do a recap and summary, and we take
7 no issue with sitting longer if necessary.

8 Okay. Thank you. Ms. Okoye.

9 MS. OKOYE: Thank you, Mr. Chair.

10 Can you hear me all right?

11 THE CHAIR: Yes, I can. Thank you.

12 MS. OKOYE: Perfect.

13 **MS. OKOYE CROSS-EXAMINES THE PANEL:**

14 Q. Good afternoon. Good afternoon, Panel, and good
15 afternoon, AT panel. My name is Ifeoma Okoye. I'm one
16 of the counsel for SCLG.

17 Mr. Hebert, can you confirm for me that, in
18 relation to soil -- for soil Dr. Whitson will be
19 speaking to that. And for wildlife and vegetation, I
20 have noted down Nick De Carlo, and wildlife, Mr. Terry.
21 Do I have those correct?

22 A. MR. HEBERT: You are correct, and certainly
23 we'll direct traffic if we reach any moments where
24 things get crossed.

25 Q. Very well. Thank you.

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1 Okay. So starting first with Mr. De Carlo. In
2 Exhibit 325, PDF 58, paragraph 206 -- paragraph
3 206(iv) -- and you don't need to bring that up but if
4 you do need, feel free to ask for it -- AT states that:
5 (as read)

6 "In an effort to reduce weed dispersal,
7 mitigation measures, such as
8 vehicle-cleaning stations, will be used
9 to limit the potential for the
10 introduction of new weeds to the PDA
11 during construction and post-flood
12 operations."

13 Can you confirm that the vehicle-cleaning stations are
14 to be used to limit the introduction of new weeds to the
15 PDA?

16 **A. MR. DE CARLO:** **Mr. Chair, that sounds correct.**

17 **Q.** Does AT not intend to clean vehicles when they leave
18 the PDA to prevent the spread of weeds outside of the
19 PDA?

20 **A. MR. DE CARLO:** **Currently, the focus is, first**
21 **off, on ensuring that vehicles arrive clean to the PDA**
22 **to prevent the introduction of weeds to the project.**
23 **And in addition to cleaning of vehicles, currently**
24 **there has not been a -- any discussion on ensuring**
25 **vehicles are cleaned leaving the PDA as well.**

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1 Q. Okay. Thank you. So in relation to the location of
2 the cleaning station, has that been determined where
3 the cleaning stations will be placed?

4 So, specifically I'm trying to find out whether AT
5 intends to place the cleaning stations at exit and
6 entry points of the site?

7 A. MR. DE CARLO: The locations have not been
8 determined at this point. However, it makes most sense
9 to have cleaning stations located at least at the
10 entrance or very close to the entrance and exits of the
11 site.

12 Q. So would every vehicle accessing the site be required
13 to report at these cleaning stations upon arrival and
14 when leaving?

15 A. MR. DE CARLO: At a minimum, all vehicles will be
16 required to be inspected when they arrive at the site
17 to ensure that they are clean and free of debris, and
18 if they are not clean and free of debris, that they are
19 thoroughly cleaned before further entering the site.

20 Q. So, can you explain how AT intends to monitor
21 compliance with the required level of cleaning -- first
22 of all, can you tell me what is the level of cleaning
23 that is required to be undertaken on vehicles and
24 equipment at the cleaning station?

25 A. MR. DE CARLO: So the details have not been

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1 finalized or worked out at this stage. However,
2 typically, vehicles would have to be completely free of
3 mud, plant debris, and they would be visually
4 inspected.

5 An environmental inspector would probably be on
6 site to ensure that the vehicles are clean and
7 documentation to record that the vehicles have been
8 inspected are sufficiently cleaned and, if not
9 sufficiently cleaned are -- or are sufficiently clean
10 are cleaned.

11 Q. So will the ideal requirement to have certain vehicles
12 steam washed and perhaps apply -- perhaps a bleach
13 solution applied to that as part of the cleaning
14 process?

15 A. MR. DE CARLO: As I indicated, the details of the
16 cleaning station have not been determined at this
17 point. Those are methods that could be included, but
18 we have not selected those measures yet.

19 Q. Okay. So, we've talked about having the cleaning
20 stations available for use during construction.

21 So my next question is will those cleaning
22 stations be available for use by operators accessing
23 the site during maintenance and also during flood
24 operations?

25 A. MR. DE CARLO: Those decisions have not been made

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1 at this point. Again, I'd say that, at the minimum,
2 all vehicles would have to be clean before they arrive
3 at the site. During operations, I believe there will
4 be more limited construction -- or vehicle traffic to
5 the site. So it's probably much easier to ensure that
6 vehicles are clean prior to leaving their main
7 facilities, and before arriving on site.

8 Q. So, but will those cleaning stations -- so you finish
9 your construction, you pack up your construction
10 equipment, and then the construction crew goes.

11 Now, the question is, so, say, five years, ten
12 years down the road, you then have to do some
13 maintenance work, will there still be cleaning stations
14 available for use at that time or is that -- that
15 hasn't been considered?

16 A. MR. DE CARLO: I wouldn't say it hasn't been
17 considered; it's not been finalized. And like I say,
18 I'm not aware of much in the line of operation work
19 that would occur five or ten years down the road where
20 there would be multiple vehicles and a cleaning station
21 would be required.

22 I think, again, it would be simpler to ensure that
23 vehicles and have an inspection at the main site where
24 vehicles are demobilizing from and documentation to
25 ensure that they are clean before they leave their

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1 site.

2 Traffic would be on -- anticipated would be on
3 main highways and they would not be travelling down
4 dirt roads, but if that was the case then, yes, I think
5 there would be the need to consider cleaning vehicles
6 before they do arrive on site.

7 Q. Okay. So if I hear you correctly, so you have one
8 maintenance or one inspector -- maintenance inspector
9 going into the site to look at the project
10 infrastructure.

11 So you're saying that AT will require that
12 maintenance inspector to, first of all, make sure that
13 his vehicle is very well cleaned, according to whatever
14 plan you have in place, before they get onto the site?

15 A. MR. DE CARLO: Yes. I can't confirm that that is
16 in the plans to date, but it is a reasonable measure to
17 help manage the potential for weed introduction to the
18 site.

19 Q. So weed introduction to the site can also occur through
20 construction materials, example gravel, riprap, lumber,
21 imported to the site and the workers walk here. Do you
22 agree with this proposition?

23 A. MR. DE CARLO: Yes, I agree with that position.

24 Q. So does AT -- and perhaps this question is for
25 Mr. Hebert, does AT commit to sourcing and using only

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1 weed-free construction materials, example, riprap,
2 gravel, at the site?

3 **A. MR. HEBERT:** One moment, Mr. Chairman.

4 Mr. Chairman, I'm informed that it is not possible
5 to confirm weed-free aggregate, but I believe the
6 question also addressed other supplies or resources.
7 Alberta Transportation will take that away as an
8 undertaking to provide a written response.

9 **UNDERTAKING - TO ADVISE IF AT WILL**

10 **COMMIT TO SOURCING AND USING ONLY**

11 **WEED-FREE CONSTRUCTION MATERIALS AT THE**

12 **SITE**

13 **Q. MS. OKOYE:** Thank you, Mr. Hebert. So going
14 back to you, Mr. De Carlo.

15 I don't know, my voice seems to be breaking up
16 here and there.

17 So one of the mitigation measures identified by AT
18 as a reduction to potential effects on vegetation and
19 wetlands is to restrict all construction activities to
20 the approved construction footprint. And that was
21 identified in Exhibit 31, PDF 42. Do you recall that?

22 **A. MR. DE CARLO:** Subject to confirmation, but that
23 sounds correct.

24 **Q.** So how does AT define construction footprints? Is that
25 within the PDA?

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1 **A. MR. DE CARLO:** **Just one moment.**

2 **I would direct you to Exhibit 31.**

3 **Q.** Perhaps we can have that pulled up on the screen,
4 please.

5 Document manager, if you could pull up Exhibit 31,
6 please.

7 **A. MR. DE CARLO:** **And then PDF page 23 of 67.**

8 **So this figure here illustrates the construction**
9 **footprint. The figure shows both the project**
10 **construction area and the major components.**

11 **Q.** Okay. So is the construction footprint all within the
12 PDA shown by the black lines on that figure?

13 **A. MR. DE CARLO:** **That is my understanding, yes.**

14 **Q.** So any construction occurring or any movement of
15 vehicles outside of the PDA is outside of the
16 construction footprint; is that correct?

17 **A. MR. DE CARLO:** **I'm not quite sure I understand**
18 **the question.**

19 **Q.** So my question is if there is any movement of vehicles
20 outside of the area identified in black on Exhibit 31,
21 PDF 23, that would be outside of the construction
22 footprint and outside of the PDA. Is that your
23 understanding as well?

24 **A. MR. DE CARLO:** **Yes, as well, though, within the**
25 **black line, we have the hatched area as well. So**

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1 vehicle movement outside of that hatched area but still
2 within the black line would also be outside of the
3 construction footprint.

4 Q. That's fine. Thank you.

5 Document manager, you can put the document down,
6 please.

7 So in Exhibit 20, PDF 86, Item 3.3.1.3, AT
8 states -- and if you need that brought up, that can be
9 brought up as well.

10 Perhaps I think we will bring it up, but I'll read
11 to you what that particular reference I'm referring to,
12 what it says. So it says, in quotes: (as read)

13 "Excavated material will be trucked from
14 the diversion channel using the base of
15 the channel and a haul road on the
16 southeast side of the channel. Spur
17 roads will connect to the channel base
18 with the parallel haul road, which will
19 connect to the local road network."

20 So my question is if we go to PDF 81 -- and, document
21 manager, you can pull up Exhibit 20 -- so if we go to
22 PDF 81.

23 So if you look at that page, I think at the bottom,
24 it says those are permanent access roads. Figure 3-11;
25 correct?

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1 **A. MR. DE CARLO:** **Could we increase the**
2 **magnification of the figure, please?**

3 **And your statement again, could you repeat it,**
4 **please?**

5 **Q.** Sorry, I haven't asked the question. I'm just trying
6 to confirm that the figure we have on the screen is
7 Figure 3-1 in relation to the permanent access roads
8 that will be on the site.

9 So now, in relation to what I have read earlier,
10 that excavated material will be trucked from the
11 diversion channel using the base of the channel and
12 also a haul road. I believe that's the haul road shown
13 in green on that figure; is that correct?

14 **A. MR. DE CARLO:** **I think that question is better**
15 **answered by somebody else on the panel who is more**
16 **familiar with the details on this figure.**

17 **Q.** Mr. Hebert, who would that be?

18 **A. MR. WOOD:** **Mr. Chair, Ms. Okoye, it's**
19 **Matt Wood here. I can attempt to answer the question.**

20 **Ms. Okoye, if you wouldn't mind, would you mind**
21 **please repeating it? I'll just take my mask off.**

22 **Q.** So the reference that I have read earlier, from PDF 86,
23 same exhibit, 20, indicated that excavation material
24 would be trucked from the diversion channel using the
25 base of the channel and the haul road on the southeast

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1 side of the channel.

2 And the question is if the haul road we're talking
3 about is the line shown on this figure in green?

4 **A. MR. WOOD:** Ms. Okoye, Mr. Chair, yes, I
5 believe that that is the case, recognizing that,
6 towards the end of construction, they may be upgrading
7 that to serve a bit more as a maintenance access road
8 from what may just be a road passing under for large
9 haul trucks.

10 So, as was mentioned, the haul will happen in the
11 bottom of the channel and also on the south side of the
12 channel. And that green line does follow the south
13 side of the channel, although, during construction,
14 there may be very small deviations from that line, but
15 generally in that direction, yes.

16 **Q.** Thank you. So if a haul truck is filled with
17 excavation material from the diversion channel and that
18 haul truck needs to get to the floodplain berm that is
19 at the south end of the PDA, which local road network
20 will that truck take?

21 **A. MR. WOOD:** Mr. Chair, much of the material to
22 construct the floodplain berm is being sourced locally
23 there. It is possible that material would need to move
24 around the site down 22; however, it is not the bulk of
25 that material.

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1 Q. Okay. So reference to what I had read before was that
2 the intention is to take material from the diversion
3 channel, move it down to the south end of the project
4 to use in constructing the floodplain berm.

5 And if I hear you correctly, you're saying that
6 the haul truck filled with that excavation material
7 will take the Highway 22 and go south and then get to
8 the floodplain area; is that correct? Sorry,
9 floodplain berm area.

10 A. MR. WOOD: Mr. Chair, this is Matt Wood.
11 That would be the route that it would need to take if
12 it were to move -- if the contractor were to need to
13 move material from that location, from the channel
14 location to the floodplain berm.

15 Q. So in terms of distance, are you able to speak to the
16 distance that the truck will go from that diversion
17 channel, join Highway 22 southbound, and then
18 cross -- cross I think there's -- Elbow River -- I
19 think it's an overhead bridge there that the truck will
20 take, cross that bridge, and then go all the way down
21 to the south where you have the floodplain berm.

22 So can you tell me what the distance is from the
23 diversion channel to the berm?

24 A. MR. WOOD: Mr. Chair, I don't have the
25 specific number, but in reference to this figure and

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1 recognizing that the roads -- the horizontal roads
2 there are separated by about a mile, it appears to me
3 that it would be approximately a mile and a half to two
4 miles to do that route.

5 Q. Okay. And in kilometres, that's about 2 to
6 4 kilometres? Sorry, I work in kilometres, not miles.

7 A. MR. WOOD: So do I. I just know that the
8 sections and quarter sections are in miles, so I was
9 just trying to do that math there. But I don't have
10 that handy; I could do the math.

11 Q. That's fine. All right. Thank you, Mr. Wood.

12 So can you confirm for me that that south portion
13 of Highway 22 going towards the south end of the PDA is
14 not within the project's footprint and is not within
15 the project development area? Any of you can confirm
16 the map? Mr. Wood or Mr. De Carlo?

17 A. MR. WOOD: Mr. Chair, it's Matt Wood. I can
18 confirm, as shown in the figure, that area on the road
19 is not considered within the PDA.

20 Q. Thank you. So when a truck filled with excavation
21 material from the diversion channel is moving down to
22 the south portion where the floodplain berm is, will
23 that truck be covered in any form or shape? So will
24 the excavation material be covered?

25 A. MR. WOOD: Mr. Chair, it's Matt Wood. If I

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1 may have a moment to briefly caucus.

2 **A. MR. SVENSON:** Good afternoon, Mr. Chair, this is
3 Mark Svenson again.

4 Yes, I believe it is required that loads be
5 covered when they are being transported on local and
6 provincial roads.

7 **Q.** Thank you, Mr. Svenson.

8 So in terms of cleaning the haul trucks, so before
9 the truck leaves that PDA, I'm still looking at the
10 figure on the screen, before the haul truck leaves the
11 PDA and joins Highway 22, will that truck be cleaned
12 before it leaves the site?

13 **A. MR. DE CARLO:** Mr. Chair, Nick De Carlo here.

14 I think it is a reasonable measure that would be
15 implemented to manage the issues of weeds dispersing
16 off the project.

17 **Q.** So Mr. De Carlo, do you agree that it's likely that
18 weed can actually disperse off of the project area?

19 **A. MR. DE CARLO:** I can agree that without
20 mitigation, weeds can disperse off of the project, yes.

21 **Q.** So in AT's reply evidence, Exhibit 325, Document
22 manager, could you please take the document down.

23 Thank you.

24 So in AT's reply evidence, Exhibit 325, PDF 57,
25 paragraph 205, it indicates that : (as read)

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1 "...AT agrees that a robust and
2 comprehensive weed management plan is
3 needed for the project..."

4 And then it goes on to state some elements of that weed
5 management plan.

6 I would like to refer you to Exhibit 273, which is
7 Dr. Osko's report at PDF 27, and I'll read to you some
8 of the recommendations in relation to some preventive
9 measures that Dr. Osko had indicated should be included
10 in the weed management plan. And I'd like to get
11 whether AT agrees to that proposition or not.

12 So Dr. Osko says that, and this is PDF 27, if you
13 want to look at it: (as read)

14 "A dispersal disruption framework for
15 the SR1 project would be more
16 comprehensive than just listing these
17 two strategies."

18 I think it's towards the lower part, yeah, hang on, I'll
19 just pull up my screen. Can you just increase the size,
20 please? Thank you. Just give me a second, I'll pull up
21 mine. I can tell you exactly where that is.

22 So sorry, that's actually the second paragraph, I'm
23 sorry. And somewhere in the middle, sorry, PDF 27,
24 second paragraph, Appendix U. Do I have that wrong?

25 Yeah, that's it. So towards the middle of that

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1 sentence, you see where it says: (as read)
2 "A dispersal disruption framework for
3 the SR1 project would be more
4 comprehensive than just listing these
5 two strategies. It would flesh out the
6 details of how cleaning vehicles and
7 equipment would be achieved, including
8 where to locate wash stations and how to
9 design them, cleaning procedures, how to
10 manage potential weed transport by
11 commuting employees..."

12 And so on: (as read)

13 "It would identify the source of all
14 incoming materials, the weed risk
15 associated with them, and identify the
16 dispersal barriers to employ. The
17 framework would assess and prioritize
18 all of the possible vectors by which
19 weeds could be transported on and off
20 the project area and identify
21 appropriate prevention actions."

22 Does AT commit to including all of these components in
23 its weed management plan?

24 A. MR. HEBERT: Mr. Chairman, it's Matt Hebert.

25 I think it would be premature to commit to

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1 specific details at this time. Certainly the items
2 that have been identified in this report could be taken
3 under consideration when the apprehensive weed
4 management plan is finalized at the time it would be
5 required to be finalized.

6 Q. So you're saying, Mr. Hebert, that AT cannot commit at
7 this time to how cleaning of the vehicles and the
8 equipment will be done? I believe those are some
9 general propositions; there's no detail in that. Maybe
10 you may want to take a look at the area that I
11 referenced.

12 A. MR. HEBERT: Mr. Chairman, as I said, and as
13 our reply submission indicates, Transportation is
14 prepared to consider these varying steps within the
15 comprehensive plan. Maybe it's possible I
16 misunderstood the question, but Transportation is
17 prepared to consider those items as part of the
18 development of a plan at the stage that that plan is
19 required to be finalized and committed for the
20 construction of the project.

21 Just Transportation is not in a position at this
22 time to comment or confirm specific detailed plans on
23 each of the items mentioned in this report.

24 Q. That's fair enough, I understand that. Thank you.

25 So in developing the weed management plan, does AT

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1 commit to working with and seeking input from local
2 stakeholders such as the members of SCLG and the
3 municipality of Rocky View in the development of the
4 plan?

5 **A. MR. HEBERT:** **One moment, Mr. Chair?**

6 So, Mr. Chairman, certainly AT would seek to
7 engage with Rocky View County. I would suspect that
8 adjacent landowners would have an interest in providing
9 input and understanding plans in this regard. And
10 Transportation also expects that the appropriate
11 technical advice or support would be involved in the
12 finalization of such a plan.

13 **Q.** So perhaps I may rephrase that a little bit. Will AT
14 seek input from residents and members of the SCLG,
15 should they wish to express such an interest, would AT
16 seek input from them in the development of that weed
17 management plan?

18 **A. MR. HEBERT:** **Certainly if local stakeholders or**
19 **area residents wish to provide input on weed management**
20 **plan, I would not see a scenario where Transportation**
21 **would reject that input.**

22 **Q.** So has AT commenced any work on this plan or not?

23 **A. MR. DE CARLO:** **Mr. Chairman, Nick De Carlo**
24 **speaking. We have not commenced work on the plan to**
25 **date.**

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1 Q. So does AT commit to making the completed plan publicly
2 available and accessible?

3 A. MR. HEBERT: Mr. Chairman, I am just conferring
4 to understand what we typically do in these
5 circumstances.

6 I don't see any reason why it wouldn't be shared.
7 I would expect that the function of the community
8 liaison would be to have the finalized mitigation plans
9 at their disposal prepared to share with interested
10 parties.

11 Q. So if an interested party request AT for a copy of the
12 plan, will AT provide that?

13 A. MR. HEBERT: We would, yes.

14 Q. Thank you. So in Exhibit 325, PDF 59, paragraph 207,
15 Roman numeral (ii), AT states that: (as read)

16 "AT does not accept that released water,
17 the source of which is the Elbow River,
18 will be an additional source of weed
19 seed distribution when returned to the
20 Elbow River. Released water will likely
21 contain weed seeds when diverted."

22 Now, in your opening statement, Mr. Hebert, you
23 indicated that weed control would, at a minimum, follow
24 the *Alberta Weed Control Act* regulations and that
25 prohibited weeds would be removed and noxious weeds

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1 controlled.

2 Is it your understanding -- is it AT's
3 understanding that the *Alberta Weed Control Act*
4 propagates the use or movement of anything that, if used
5 or moved, would spread a noxious weed or prohibited
6 noxious weed?

7 A. MR. HEBERT: One moment, Mr. Chairman.

8 THE CHAIR: Ms. Okoye, we'll be looking for a
9 break maybe 3:15 or 3:20, if you can kind of get your
10 break in the question in there that would work. That
11 would be great, thank you.

12 MS. OKOYE: Definitely will do. Thank you,
13 sir.

14 A. MR. HEBERT: Mr. Chairman, Mr. Brescia will
15 provide a response.

16 A. MR. BRESCIA: Hi, Mr. Chairman, it's Mr. Brescia
17 here.

18 What I would say we do understand that is what the
19 *Weed Control Act* says.

20 As a function of the project, natural floodwaters
21 which may contain weed seeds would be diverted into the
22 reservoir and then would again be released upon -- upon
23 passing of the flood as per the project operations.

24 Q. So does AT agree, based on the *Weed Control Act*, that
25 it is prohibited from releasing from the Elbow River

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1 any diverted water that contains weed seeds, including
2 noxious and prohibited weed seeds and plant parts?

3 **A. MR. BRESCIA:** Mr. Chairman, I don't know that I
4 can comment specifically on the legal terms of the Act.
5 But what I can say is Alberta Transportation has
6 committed to a comprehensive weed management program to
7 minimize a weed development and spread.

8 **Q.** Thank you. And I wasn't asking you to do a legal
9 interpretation; just trying to understand AT's
10 understanding of the Act.

11 **MS. OKOYE:** Okay. Mr. Chairman, we can
12 probably break here and I will continue with the rest
13 of my questions after the break.

14 **THE CHAIR:** Good. Thank you, Ms. Okoye.
15 Let's return at 3:15.

16 (ADJOURNMENT)

17 **THE CHAIR:** Mr. Wiebe, I think we're ready to
18 go.

19 So just before you start, Ms. Okoye, I've gone
20 through the timing for the remainder of directs and
21 crosses. And if SCLG is at 270, started at 300, which
22 I think is what we've agreed to, and the Board, I think
23 we likely need 30 minutes or no more. But that would
24 leave for Transportation tomorrow and all of the rest
25 of the directs and that. But that would essentially

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1 leave Transportation with 115 minutes for
2 cross-examination and for rebuttal evidence, if you
3 have any, which might be a little shy. That's much
4 less than what you've asked for.

5 So I'm not sure if you can respond to that now or
6 not, but if not, then I would suggest that we perhaps
7 sit until 5:30, gain at least 30 minutes. We can
8 probably skim a little bit at lunch, and then we might
9 be pretty close. But otherwise, we'll be either going
10 a little bit late tonight or quite a bit potentially
11 even later tomorrow night.

12 So, Mr. Kruhlak? Mr. Secord? Others?

13 MR. SECORD: Mr. Chair, if my partner finishes
14 before 5, and subject to the court reporter, I'm
15 certainly prepared to go to 5:30.

16 I know Mr. Kennedy talked about the old days. I
17 should mention in the old days, we had one hearing
18 where we lost a court reporter because she quit because
19 we sat so late.

20 So as long as Ms. Vespa is prepared to carry on,
21 then I'm certainly prepared to go to 5:30.

22 THE CHAIR: Ms. Vespa, you're good for 5:30?

23 Thank you.

24 Transportation? Others?

25 MR. KRULHAK: Mr. Chairman, it's Ron Kruhlak.

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1 We've canvassed our panel in advance. We're certainly
2 prepared to remain as long as the Board and the court
3 reporter are prepared to continue.

4 As I said, we're anxious to try to ensure we had
5 an adequate cushion for tomorrow. So if it's 5:30 or 6
6 or longer, we're certainly prepared to remain.

7 THE CHAIR: I think 5:30 should work. If we
8 can finish by 5 tomorrow, great, but if not, we may
9 need to run a bit later tomorrow.

10 Ms. Vespa and Ms. DiPaolo, you'll be available
11 past 5 tomorrow if necessary?

12 Thank you. And hopefully our document sharers
13 don't quit on us because they work for us.

14 Okay. Thank you very much, everyone. Ms. Okoye,
15 please proceed.

16 MS. OKOYE: Thank you, Mr. Chair.

17 Q. So following -- so in Exhibit 325, PDF 59, paragraph
18 207, and again, this is the reply evidence, AT states
19 that -- AT states: (as read)

20 "...the implementation of infiltration
21 systems small enough to address weed
22 seeds would have serious adverse effects
23 to the mobility of fish seeking to exit
24 the reservoir on release."

25 So I'd like to put this proposition to you,

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1 Mr. De Carlo, and let me know if you agree with that:
2 The vast majority of the off-stream reservoir's
3 existence will be in times of non-flood or post-flood
4 drained condition during which the risk of seed weeds
5 and plant parts entering the Elbow River via the
6 low-level outlet will continue. Do you agree with that?

7 **A. MR. DE CARLO:** Mr. Chair, I think that's
8 dependent on the conditions in the PDA and how
9 vegetation and weeds are being managed.

10 **Q.** Okay. So I'd like you to focus your attention to the
11 reservoir area. So can you tell me if you agree that
12 in dry operation or non-flood conditions, the reservoir
13 can contain seed weeds and plant parts deposited there
14 by floodwaters and the rooted soil from the off-stream
15 dam or soil material deposited by the ephemeral
16 tributaries within the reservoir?

17 **A. MR. DE CARLO:** Mr. Chairman, and that's specific
18 to post-flood. So yes, following a flood event,
19 sediment and material could be deposited within the
20 reservoir.

21 **Q.** And also in dry operations. So during periods in
22 between events, in between flood events, do you agree
23 that, you know, that weed seeds can also be present and
24 continue to move through the tributaries and probably
25 into the low-level outlet?

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1 **A. MR. DE CARLO:** Mr. Chair, I agree there are
2 various factors that could disperse weed seeds and
3 propagules to the reservoir in dry operations.

4 **Q.** So can you confirm that the tributaries within the
5 reservoir are not fish-bearing?

6 **A. MR. DE CARLO:** I cannot confirm that personally.
7 I am not a fisheries biologist.

8 **Q.** I'll refer you to Exhibit 29. I apologize, document
9 manager, I don't think I had included that. But in
10 Exhibit 29, if we go to PDF 23, it actually says there
11 that: (as read)

12 "The tributaries to the Elbow River in
13 the LAA appear to be ephemeral
14 (seasonal) in nature and are unlikely to
15 contain sensitive or life stage
16 dependent fish habitat."

17 Do you disagree with that?

18 **A. MR. DE CARLO:** Could we bring up the document in
19 question, please?

20 **Q.** That is Exhibit 29, PDF 23. So PDF 23. That's towards
21 I think it's the second to the last, yeah.

22 Second-to-the-last paragraph, just at the bottom.

23 Second-to-the-last paragraph, if you read that,

24 Mr. De Carlo.

25 **A. MR. DE CARLO:** Yes, I'm reading that, and it does

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1 look -- it looks as what you've stated.

2 Q. Okay. And so since we agree that the tributaries are
3 not fish-bearing waters and there will be no harm to
4 fish that would result from operating the low-level
5 discharge filtration during non-flood operation, do you
6 agree with that?

7 A. MR. DE CARLO: One moment, I'd just like to
8 caucus.

9 A. MR. SPELLER: Mr. Chairman, Ms. Okoye, it's
10 Wayne Speller.

11 I think it's helpful to point out in the exhibit
12 that we're talking about, Exhibit 325, at Point 2,
13 about an installation of a filtration system and what
14 we're talking about in terms of fish.

15 So we're not discussing fish that are currently in
16 any of the watercourses within the PDA; we're talking
17 about a post-flood event where there is an expectation
18 that some fish may get entrained.

19 Those fish need to be able to be released with the
20 water out the low-level outlet. That's my
21 understanding of when we point -- when we say a
22 filtration system small enough to address weed seeds
23 would have serious adverse effects to the mobility of
24 fish to exit the reservoir on release. It's those
25 potentially entrained fish we're discussing; it's not

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1 fish that are there right now.

2 Q. Thank you, Mr. Speller, for that clarification.

3 So other than -- so outside of post-flood events,
4 is there a likelihood that any of those tributaries
5 within the reservoir can have fish in them naturally?

6 A. MR. SPELLER: Mr. Chair, subject to check, no,
7 we're not expecting post-construction that there would
8 be fish.

9 Q. Thank you. So, then, if a weed -- what did we call it
10 again? If a weed filtration system is attached to the
11 low-level outlets and allowed to operate only in
12 non-flood conditions, is that something that AT will
13 agree to consider and implement as a way to prevent the
14 dispersal of weeds from the reservoir to other areas?

15 A. MR. HEBERT: Mr. Chairman, as we've described,
16 it's anticipated the project will have some form of
17 weed control framework.

18 As such, we would not view it as necessary to
19 install a weed filtration device at the low-level
20 outlet.

21 Q. So can you explain to me, then, what AT plans to do in
22 order to control the spread of seed weeds, and I'm not
23 talking about the weeds that have already come up and
24 are already a form of vegetation but actually the seeds
25 themselves, how you plan to control that from leaving

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1 the reservoir area and getting into the low-level
2 outlet and then into Elbow River?

3 A. MR. HEBERT: Mr. Chairman, I will redirect one
4 of my colleagues, just one moment.

5 Mr. Chairman, Mr. De Carlo will respond to the
6 question.

7 A. MR. DE CARLO: Mr. Chair, Nick De Carlo speaking.

8 The intent of the weed management plan is to
9 control weeds that are on the project and not to
10 control weeds that are present off of project lands
11 that could disperse to the area propagules and then get
12 further get down into the Elbow River. This is already
13 occurring and will continue without the project.

14 Q. So isn't the reservoir a part of the project?

15 A. MR. DE CARLO: Yes, the reservoir is part of the
16 project, but as I've explained, the intent is to
17 control the weeds on the project. Weeds seeds that are
18 dispersing to the site are dispersing from activities
19 and presences in the surrounding lands, and AT cannot
20 be responsible for managing surrounding properties.

21 Q. So let's forget about surrounding properties and just
22 focus on the reservoir area.

23 Are you saying that when the floodwater is
24 diverted from the Elbow River and then it gets into the
25 reservoir area, that there will not be any seed weeds

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1 included in that diverted water?

2 **A. MR. DE CARLO:** Mr. Chair, no, that is not what
3 we've stated. We've stated that there may be, and
4 likely is, weed propagules in the water that would be
5 diverted from the Elbow River. And that dispersal is
6 already occurring without the project and that the
7 project will manage the site itself and weed
8 occurrences on the site to minimize the project's
9 contribution to weed dispersal further downstream.

10 **Q.** Thank you. So in relation to those weed seeds that get
11 in, either through the diverted water or that are
12 brought onto the reservoir area from any of the
13 tributaries or that come into the reservoir area from
14 any other source, how will AT deal with the weed seeds?

15 And I'm not talking about the ones that are
16 already like vegetation, but the seeds themselves.

17 **A. MR. DE CARLO:** Mr. Chair, Nick De Carlo speaking
18 again.

19 The most important measure for controlling weed
20 seeds is ensuring that the project itself manages weeds
21 such that any seeds that -- and other propagules that
22 come onto site don't have an opportunity to establish
23 and reproduce and further add to the weed issue.

24 **Q.** So, Mr. Hebert, can you comment on whether the
25 operation of the filtration system can be limited to

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1 dry or non-flood conditions, assuming that you are able
2 to install that?

3 A. MR. HEBERT: One moment, Mr. Chairman.

4 Mr. Chairman, under the circumstances, it may
5 benefit from a written response, so Transportation will
6 undertake that.

7 Q. Thank you.

8 UNDERTAKING - TO ADVISE WHETHER THE
9 OPERATION OF THE FILTRATION SYSTEM CAN
10 BE LIMITED TO DRY OR NON-FLOOD
11 CONDITIONS

12 MS. OKOYE: When you're doing that, can you
13 also undertake to advise us of any restrictions that
14 will make the design and installation of the filtration
15 system not feasible. Is that acceptable?

16 A. MR. HEBERT: Mr. Chairman, we will include that
17 as part of the undertaking.

18 MS. OKOYE: Thank you.

19 UNDERTAKING - TO ADVISE OF ANY
20 RESTRICTIONS THAT WILL MAKE THE DESIGN
21 AND INSTALLATION OF THE FILTRATION
22 SYSTEM NOT FEASIBLE

23 Q. MS. OKOYE: So, Mr. Hebert, today you stated
24 in your opening statement that if weeds are detected
25 and found to be above acceptable targets, response

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1 options will be considered and applied. Do you recall
2 that? That's actually Exhibit 380.

3 **A. MR. HEBERT:** Yeah, I stated that earlier today.

4 **Q.** Thank you. So what is AT's acceptable target for weeds
5 before a response option is considered and applied?

6 **A. MR. HEBERT:** Mr. Chairman, I believe one of my
7 colleagues can provide an answer to that question.

8 **A. MR. DE CARLO:** Mr. Chairman, Nick De Carlo
9 speaking.

10 The details have not been finalized at this point,
11 and AT and AEP will be working with the Rocky View
12 County to identify desired levels and control methods.

13 **Q.** Okay. Thank you, Mr. De Carlo.

14 I will now shift to biodiversity issues now.

15 So Mr. De Carlo, I'll continue with you for now.

16 So there seems to be some discrepancy between what
17 hydrologists and riparian ecologists use to define
18 riparian lands. So I'd like to ensure that we are both
19 on the same page when we talk about riparian habitat.

20 An aid to cross was presented to your counsel
21 yesterday from Alberta Water Council. Did you review
22 that aid to cross?

23 **A. MR. DE CARLO:** Yes, Mr. Chairman, I have reviewed
24 that cross.

25 **Q.** Thank you. Document manager, could you please pull

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1 that up?

2 Thank you. So if we go to page 2 of that
3 document, at the bottom of the page, you could probably
4 expand that, please.

5 THE CHAIR: Ms. Okoye, has this been entered
6 an exhibit already?

7 MS. OKOYE: No, I don't believe it has been.
8 So perhaps it could be marked as an exhibit.

9 THE CHAIR: You do intend on using it.

10 MS. OKOYE: Yes, I do intend on using it.

11 THE CHAIR: Ms. Friend?

12 MS. FRIEND: The next exhibit number is 393.

13 MS. OKOYE: Thank you, Ms. Friend.

14 THE CHAIR: 393, thank you, Ms. Friend.

15 **EXHIBIT 393 - SCLG AID TO CROSS 1 -**
16 **FROM ALBERTA WATER COUNCIL RIPARIAN**
17 **LAND CONSERVATION EXCERPT**

18 Q. MS. OKOYE: So, Mr. De Carlo, do you agree
19 with that definition under page 2? And also if we go
20 to page 3, there's an illustration there. Do you agree
21 with that definition and illustration?

22 A. MR. DE CARLO: Mr. Chair, yes, I agree this is in
23 line with commonly accepted definitions for riparian
24 areas.

25 Q. Thank you. Document manager, you can put that down,

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1 please. Thank you.

2 So in Exhibit 327, PDF 40, AT notes in response,
3 I believe that was Stantec, notes in response to
4 Mr. Dowsett's submissions that without SR1, there would
5 be more area inundated, that inundated areas would be
6 greater, flow velocities would be higher, and there
7 would be more debris within that flow.

8 So I'd like to know from you what are the effects
9 on floodplain vegetation of SR1 from the reduction of
10 area inundated, the depth of the inundation, and the
11 reduction of flow velocities and debris. And if you
12 could include in your explanation the impacts related
13 to changes current depth and extent, reduction in
14 channel migration, wetlands and reduction in depth and
15 area of sediment deposition?

16 **A. MR. DE CARLO:** Mr. Chairman, if I can just have a
17 moment.

18 **THE CHAIR:** Yes, please.

19 **A. MR. DE CARLO:** Mr. Chair, if we could bring up
20 **NRCB AEP IR 14, Round 2. Actually, I believe it's**
21 **Round 1. Just give me one more moment. I'll just**
22 **confirm this.**

23 **THE CHAIR:** Sure. Has there been an exhibit
24 number attached to it? If so, that would be much
25 easier.

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1 A. MR. DE CARLO: Yes, just one moment, and I'll
2 provide that.

3 THE CHAIR: Thanks.

4 A. MR. DE CARLO: Mr. Chair, it's Exhibit 138,
5 PDF page 79.

6 THE CHAIR: So 138, page 79?

7 A. MR. DE CARLO: Correct.

8 THE CHAIR: Thank you. Thanks, Ms. Taylor.

9 A. MR. DE CARLO: And if we could magnify that,
10 please.

11 So this IR response explains the changes that
12 would be expected from the altered frequency and flows
13 on the Elbow in response to the project, and in
14 general, there will be a narrowing of the channel and a
15 decrease in scouring.

16 Q. MS. OKOYE: So is that all your response?

17 A. MR. DE CARLO: One moment, please.

18 Q. Okay.

19 A. MR. DE CARLO: Yes, it's not a simple issue.

20 Q. Okay.

21 A. MR. BRESCIA: Mr. Chairman, it's Dave Brescia
22 here.

23 So what we've done in this information request is
24 it examines five ecological and geomorphic processes
25 that we've examined as to how the presence of SR1's

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1 operations would affect these processes. And those
2 processes are overbank deposition, bank erosion rates,
3 channel morphology, scour and maintenance of pools, and
4 maintenance and formation of side channels. And I
5 believe these have some slightly different terminology
6 than Ms. Okoye had mentioned there. But generally
7 they're similar processes.

8 And overall, we've looked at and explained here
9 how those process would change, and for -- in summary,
10 like three of the five processes would generally be a
11 neutral change.

12 Two of them we do ascribe would be an adverse
13 change over the long term, and those would be the
14 maintenance and formation of side channels, as well as
15 the channel morphology overall. And those would be
16 somewhat simplified over the long term.

17 And part of that is a tradeoff of the function and
18 design of the project which is designed to reduce
19 flooding downstream. It's the stated purpose and
20 design, and I seem to have turned off my camera. There
21 we are.

22 So I think that covers those processes that
23 Ms. Okoye mentioned.

24 Q. Okay. So in your view, those are the effects -- those
25 are going to be the effects of floodplain vegetation?

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1 **A. MR. BRESCIA:** Those are the effects that do
2 relate to floodplain vegetation and establishment and
3 some of the description in this response such as
4 overbank deposition and how that relates to the
5 maintenance of the floodplain.

6 **Q.** So I'll just switch a little bit to Dr. Whitson.

7 Dr. Whitson, are you there?

8 So in Exhibit 327, PDF 190, you indicate that the
9 revised modelling was undertaken in response to a
10 request from the IAAC. Can you tell us when this IAAC
11 IR 4-01 was issued and if it was filed with the
12 NRCB?

13 **A. MR. BRESCIA:** Mr. Chairman, it's Dave Brescia
14 again.

15 I'll just start by saying, in about mid-December
16 of last year, we had identified that the new sediment
17 deposition areas that were modelled for the Round 2
18 IAAC SIRs had implications for other EIA components
19 that we had initially missed, and we started looking
20 into this.

21 In January of this year, 2021, as part of this
22 work, we also learned of the new sediment modelling
23 included sediment texture information that we had not
24 needed for that initial IR response. And we reviewed
25 that information as well.

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1 And so we analyzed the new sediment area and
2 texture information starting in January and February to
3 understand the implications that they would have for
4 soil and with respect to our conclusions. And those
5 conclusions are included in our March 12th submission
6 that you referred to.

7 Q. Thank you, Mr. Brescia.

8 Document manager, could you please put up
9 Exhibit 327 and if we could go to PDF 196.

10 So, Dr. Whitson, that's a map of your revised
11 modelling on your calculations for change in
12 agricultural land capability classes for the late
13 release design flood; correct?

14 A. **MR. WHITSON:** Mr. Chair, this particular figure
15 that was just brought up is actually referring to
16 sediment thickness and the change in sediment thickness
17 after the design flood late release event.

18 So it's not a figure that shows the land
19 capability change.

20 Q. That's actually correct, yes. It shows the sediment
21 deposition thickness.

22 So I'd like us to focus on that legend, legend at
23 the bottom, bottom right-hand of the screen.

24 In there, you showed the sediment thickness
25 changes. The categories are 0 to 3 centimetres, 3 to

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1 20, 20 to 100 and above 100 centimetres.

2 Now, that categorization is not consistent with
3 the 10 to 100 centimetre category that was used in the
4 vegetation evaluation, for instance, in Exhibit 49,
5 PDF 25. Perhaps, document manager, you could pull up
6 49, PDF 25, but don't lose this page. PDF 25,
7 Exhibit 49.

8 Doesn't look like what I have on my screen. So
9 Exhibit 49, PDF 25. Thank you. Thank you, document
10 manager.

11 So if you look at that Table 10-11, it lists a
12 different sediment deposition category of less than 3,
13 3 to 10, 10 to 100, and greater than 100 centimetres.
14 Are you able to provide a sediment thickness change
15 mapping that is consistent with this categorization in
16 Table 10-11 of PDF 25 of Exhibit 49?

17 **A. MR. WHITSON:** Mr. Chair, we're going to caucus
18 about that for a second.

19 **MS. OKOYE:** Mr. Chair, we probably will have
20 to have an extra time with all the time they're taking
21 for caucusing.

22 **THE CHAIR:** I've been kind of watching, and
23 while sometimes it may seem like a while, it doesn't
24 take all that long.

25 **MS. OKOYE:** Okay. Thank you.

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1 A. MR. WHITSON: Mr. Chair, I'm back and ready to
2 address that question. This is Ivan Whitson.

3 THE CHAIR: Proceed, please.

4 A. MR. WHITSON: Now, the table that we see before
5 us was prepared by my colleague in vegetation. And for
6 their own reason, vegetation has the categories --
7 thickness categories you see in front of us.

8 But soil has its own reasons for choosing certain
9 thicknesses, and those were the thickness categories
10 that we also used in the 2018 environmental assessment
11 and for our calculation purposes and for our analysis
12 purposes.

13 And I can explain to you why we chose those
14 particular thresholds and why we're justified in using
15 them and why they don't match the thresholds chosen by
16 my colleague in vegetation and possibly other
17 disciplines in our panel here.

18 If I may proceed with that, Mr. Chair.

19 Now, you may -- it may sound obvious, but why
20 would I choose zero as an important threshold. But it
21 is an important threshold because as soon as you have
22 any appreciable sediment accumulating on the reservoir
23 floor after a flood, there's a considerable portion of
24 that sediment that contains calcium carbonate minerals
25 in some form or another, bicarbonates or carbonates.

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1 And over time, those will enter soil ever so slightly,
2 depending on the starting point of that soil material.

3 Now, the threshold of three --

4 THE COURT REPORTER: Excuse me, excuse me, Dr. Whitson.

5 You cut out there. You said, "And over time, those
6 will enter the soil ever so slightly..."

7 A. MR. WHITSON: Yes, I'm sorry, I'll continue.

8 Some of that calcium carbonate mineral will enter
9 the soil, either physically or by being dissolved in
10 water, and it will change the soil pH. It will raise
11 the soil pH a little bit higher from what it was prior
12 to that. So the pH change is important and why
13 anything above zero is important.

14 Now, the threshold of 3 centimetres, that was
15 judged to be important from a soil erosion
16 perspective/wind erosion perspective because in my
17 judgment, any sediment thicker than 3 centimetres is
18 just thick enough that it could start to be mobilized
19 or detached by wind movement. That should be clear.

20 Now, 20 centimetres of -- was chosen because
21 again, in my judgment, a thickness of 20 centimetres is
22 just enough that it's going to start to affect the
23 overall quality or productivity of the soil material
24 underneath, and so we selected 20 centimetres as an
25 important threshold.

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1 Now, the last threshold of 100 centimetres, in the
2 language of soil survey, we separate layers thicker
3 than 100 centimetres from layers thinner than
4 100 centimetres for various flood taxonomic practice.

5 And consistent again with the environmental
6 assessment, we separated soil materials thicker than
7 100 and those thinner than 100, and we were able to
8 calculate various properties such as land capability
9 and that sort of thing.

10 And so the figure that you first called for,
11 Exhibit 327 on PDF page 196, presents the -- the
12 post-flood late release -- post-design flood late
13 release picture of sediment thickness according to
14 those estimated thicknesses provided by my colleagues
15 in the hydrology group.

16 Q. Okay. So, sorry, Dr. Whitson, are you done? I'm
17 sorry, I didn't mean to interrupt you.

18 A. MR. WHITSON: No, I had, in fact, just finished.

19 Q. Okay. Thank you. So if I hear you correctly, you are
20 saying that, for your purpose, for your soils report,
21 you choose a different categorization different from
22 what the vegetation people would choose; is that a fair
23 statement?

24 A. MR. WHITSON: That's a fair statement.

25 THE CHAIR: Mr. Whitson, if this is going to

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1 continue a little bit, perhaps you could try just
2 moving your mic down. It's overdriving, I think.

3 I notice the court reporter at times struggling a
4 little bit. Your mic seems to be overdriving. We've
5 had other folks a little soft, but yours seems to
6 overdrive. But I'm not sure if others are noticing
7 that, but Ms. Vespa...

8 COURT REPORTER: Can you speak now, Mr. Whitson?

9 **A. MR. WHITSON:** Yes, Mr. Chair. I just chose to
10 reduce my volume a smidge to see if that made a
11 difference.

12 THE CHAIR: It seems to be doing the same
13 thing.

14 Ms. Vespa, are you able to get it or...

15 COURT REPORTER: I have been. Maybe we can try
16 reducing it or pulling the mic out a little bit.

17 THE CHAIR: Yeah, pull the mic down just a
18 bit. Try that.

19 **A. MR. WHITSON:** How does that sound?

20 THE CHAIR: Just up just a little bit, and I
21 think we've got it.

22 **A. MR. WHITSON:** How does that sound?

23 THE CHAIR: Yeah, that's better. Thank you.

24 Ms. Vespa?

25 **A. MR. WHITSON:** How does that sound?

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1 COURT REPORTER: That's great. Thank you.

2 A. MR. WHITSON: You're welcome.

3 MS. OKOYE: Thank you.

4 Q. So, Dr. Whitson, you say, then, that it's not possible
5 for you to provide a sediment thickness change mapping
6 that would be consistent with the categorization
7 provided in that Table 10-11 that we were looking at
8 earlier?

9 A. MR. WHITSON: Mr. Chair, there is a figure that
10 shows the thicknesses using the thresholds that
11 vegetation has used, and it's in Exhibit 218 on PDF
12 page 85. And I believe that contains a figure that
13 shows the thicknesses broken down by the categories
14 used by vegetation.

15 I may not be able to speak to it, but that's what
16 that figure contains.

17 Q. Thank you. Dr. Whitson, I know about that. We will
18 get to it in a moment.

19 So, Mr. De Carlo, did you conduct any work on the
20 impasse to vegetation based on the revised modelling
21 and the change in sediment deposition that was done by
22 Dr. Whitson? If you didn't, can you tell us why you
23 didn't do that?

24 A. MR. DE CARLO: We did not conduct any additional
25 assessment following Dr. Whitson's revised assessment.

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1 Our assessment of the change in sediment patterns
2 is included in Exhibit 218, which is on the screen, and
3 the difference in category has been considered within
4 the vegetation assessment with the fact that, in the 10
5 to 100-centimetre category, vegetation assessment
6 assumes all grasses and phorbs are lost.

7 Q. I'm sorry, can you repeat that last sentence? I didn't
8 quite get that.

9 A. MR. DE CARLO: So in the sediment depth category
10 of 10 centimetres to 100 centimetres, the vegetation
11 assessment assumes that grasses and phorbs are lost.

12 Q. Thank you. So back to you, Dr. Whitson -- document
13 manager, you can take that down.

14 So back to your report, Exhibit 327, PDF pages
15 190, 191, and 198, you describe the change in
16 agricultural land capability classes because of your
17 revised modelling. And then in the end, you conclude
18 that: (as read)

19 "The change in agricultural land
20 capability does not affect the
21 conclusions presented in the EIA and
22 SIRs."

23 Are those conclusions still valid?

24 A. MR. WHITSON: Mr. Chair, the conclusion I think
25 that I'm speaking to in those paragraphs is that the

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1 project's effect on agricultural capability of soils is
2 adverse, high magnitude and significant. And those
3 conclusions remain.

4 What -- what changes is the details around those
5 conclusions, perhaps the areal extent of the land
6 capability reduction, that sort of thing, that does
7 shift but it's in a negative direction still. So it's
8 still an adverse, high magnitude change of significant
9 effect on soils. That's what those statements mean.

10 Q. Okay. So my question, I'd like, document manager, to
11 pull up Exhibit 94, PDF 27. So that's Table IR 368-2,
12 the second one. AT sets out the changes in areas of
13 agricultural land capability.

14 Can you provide a table that shows the impact of
15 your revised calculations on the hectares of land and
16 compares each of the agricultural land capability
17 classes, similar to what you have provided in
18 Exhibit 94, PDF 27.

19 A. MR. WHITSON: This is Ivan Whitson. Let me
20 caucus with my colleagues, please.

21 Q. Okay. Thank you.

22 A. MR. WHITSON: Mr. Chair, this is Ivan Whitson
23 again. Some further thought about the question posed
24 by Ms. Okoye.

25 Now, sorry to go back to Exhibit 327, sort of in

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1 the page ranges that have been identified. One of the
2 results or the outcomes of that analysis is that the
3 size of the -- of the sediment plume is considerably
4 larger than the size of the sediment plume back in the
5 2018 EIA. So it's larger, much greater in extent.

6 I don't have an exact extent of the 20 to
7 100-centimetre thickness isotherm -- isopach but it's
8 considerably larger and it's in the order of two,
9 three, times bigger than the 2018 EIA soil plume,
10 thickness plume. So we know that there's a greater
11 reduction in land capability in terms of the area, but
12 we don't have the exact area worked out.

13 So I guess just to reiterate, there's a much
14 larger extent of land capability reduction in this
15 revised sediment modelling.

16 But, then, there's an opposite effect going on as
17 well in that -- because of the change in textural
18 distribution with the revised sediment modelling, now
19 we've got a situation where there's a spatial pattern
20 in the soil texture that wasn't evident in the 2018
21 EIA.

22 I'm not going to call up the exhibits or anything,
23 but in the 2018 soils analysis, the sediment plume was
24 predicted to be quite sandy, mostly sand particles with
25 some silt, and its overall land capability was rated

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1 anywhere from Class 5 to Class 7.

2 Now, one of the things that got me excited about
3 the revised sediment modelling is that there's a lot of
4 that area that is now dominated by silt particles and
5 clay particles, which, from a soils perspective, is a
6 really nice new story. It's not all uniformly sandy,
7 low water storage capacity.

8 And, in fact, when you calculate land capability
9 now, for the individual soil types that I expect to be
10 identified under that sediment plume, we've got some
11 soil types now that essentially have land capability
12 ratings of just Class 4.

13 So there's two forces going on now that are kind
14 of now in opposition. Yes, there's a much greater
15 extent of sediment and I would readily admit that the
16 amount of land capability declined is greater than
17 before. But the land capability within that plume is
18 somewhat slightly -- is not as adverse as it used be.
19 Some areas that were Class 5 to Class 7 will now shift
20 to Class 4.

21 So, Mr. Chair, I know that's a long-winded answer.
22 We haven't got areal extents to show these sorts of
23 things, but I readily admit that the extent is greater
24 than it was presented in the 2018 environmental
25 assessment.

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1 And, again, to strike the overall conclusion, the
2 conclusion in the 2018 environmental assessment, this
3 was a high magnitude adverse effect on soil land
4 capability, that's consistent, that hasn't changed. It
5 was greater than 10 percent reduction in the extent of
6 land capability Class 2 before, and it will be even
7 greater than that now.

8 That's the end of my answer, Mr. Chair.

9 Q. Thank you, Dr. Whitson. So if I understand you
10 correctly, are you saying that you're not able to take
11 the question that I have posed to you away and come
12 back with the revised table that will actually show the
13 hectares of land that are affected, based on your
14 revised calculation? That's not something you can take
15 away as an undertaking and come back?

16 A. **MR. WHITSON:** Mr. Chair, we're not promising to
17 do that. The land -- if this project is approved, this
18 land is not going to have an agricultural use. The
19 land capability is not that important going forward.
20 We know that there will be a reduction of land
21 capability, and if we were to recalculate the land
22 capability change over and over again like this, it
23 would be a -- it would be a never-ending process.

24 Q. Okay. Thank you, Dr. Whitson.

25 **UNDERTAKING - TO PROVIDE A REVISED**

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1 TABLE THAT WILL SHOW THE HECTARES OF
2 LAND THAT ARE AFFECTED BASED ON THE
3 REVISED CALCULATION BY MR. WHITSON -
4 REFUSED

5 Q. MS. OKOYE: So in terms of the reduction in
6 LCC Class 2 -- I don't know, maybe you might have
7 answered that, but what I'm looking at is if you can
8 tell me by how much greater you expect that reduction
9 in LCC Class 2 to be in comparison to what you have
10 reported in the EIA.

11 A. MR. WHITSON: Mr. Chair, I will make an attempt
12 to do that, as long as you give me some latitude that
13 it's approximate, and I won't -- I won't quote numbers
14 in terms of hectares because I'm not that good at that.

15 But I'll say, strictly speaking, based on the
16 extent of that sediment plume change that we presented
17 in Exhibit 327, and the figure that showed the
18 thickness, that makes up an extent of about a quarter
19 of the PDA.

20 And a quarter of the PDA, by my math, is in the
21 order of -- well it's a quarter of the PDA. The PDA
22 is -- just a second -- about 1440 hectares, so a
23 quarter of that is about 350 hectares, something like
24 that, by my math. So that would be my -- that would be
25 my approximation, Mr. Chair.

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1 Q. Thank you. So in Exhibit 94, PDF 16 -- if we go to PDF
2 16. So I think we'll go down. Perfect. Number B.
3 Can you expand that, please?

4 A. MR. WHITSON: Mr. Chair, at the completion of
5 our environmental assessment and the initiation of the
6 IR process, it was pointed out to us that we had
7 misspoke in terms of our conclusions about land
8 capability change with the project, and we adjusted the
9 conclusions to indicate that this project would have a
10 significant effect on soil quality, an adverse negative
11 effect, and that that would be significant.

12 And so we produced -- we produced, subsequently,
13 an IR 365, as indicated here, indicating that post
14 construction -- post-construction effect on the
15 agricultural land capability would be significant and
16 adverse.

17 We also produced an IR similar to this -- I don't
18 know if I'm getting ahead of myself -- in an IR 393
19 when we -- we changed our conclusion with respect to
20 the effect of flood or design floods on the same
21 property, on agricultural land capability, and we
22 admitted that this would be a significant adverse
23 environmental effect on soil capability for
24 agricultural purposes.

25 I hope that answers the question, Mr. Chair.

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1 Q. Thank you, Dr. Whitson. You did answer my next
2 question. So I will skip that, and I will go to
3 Mr. De Carlo.

4 Mr. De Carlo, is your response the same as for
5 soils in the sense that the changes in sediment area do
6 not affect the conclusions presented in the EIA and
7 SIRs in relation to impacts on vegetation?

8 A. MR. DE CARLO: Mr. Chairman, just one moment,
9 please.

10 Hello, Mr. Chair. If I could point to
11 Exhibit 218, page 83 through 86, this is in response to
12 the IR question on the change in the sediment
13 deposition, expected patterns and extent. And although
14 there is a change in the distribution of sediment, the
15 analysis and results provided in this IR response is
16 that the significance, determination, and conclusions
17 of the vegetation assessment remain unchanged.

18 Q. Thank you. So can you summarize for me, Mr. De Carlo,
19 the main conclusions in your EIA and SIRs that will not
20 be affected by the change in sediment deposition
21 information presented by Dr. Whitson?

22 A. MR. DE CARLO: One moment, Mr. Chair, I'd like to
23 caucus with my colleague.

24 Q. Document manager, you can take the document down,
25 please.

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Cross-examined by Ms. Okoye

1 **A. MR. DE CARLO:** So, Mr. Chair, my apologies for
2 the break there.

3 The conclusions and the change in my colleague's
4 Dr. Whitson's assessment of the revised sediment
5 modelling does not affect the conclusions of the
6 vegetation because the land capability is an
7 agricultural rating and isn't related to the
8 revegetation potential.

9 **Q.** Okay. Thank you.

10 So Exhibit 324 in PDF 22 to 28, AT describes the
11 environmental assessment methodology and how cumulative
12 effects are dealt with, as well as describing the
13 cumulative effects on wildlife and wildlife habitat.

14 So my next set of questions will go to Mr. Terry.

15 Now, are the calculations for habitat loss in SR1,
16 which you have indicated to be less than 1 percent
17 upland and wetland cover types and 0.1 percent for
18 native upland, are those calculations correct given
19 that we have new calculations for areas of sediment
20 deposition presented in the -- presented for soils in
21 Exhibit 325?

22 **A. MR. TERRY:** Sorry, could you repeat the
23 question? Are you asking that that's a less than
24 1 percent change for cumulative effects during
25 post-flood?

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1 Q. I'll repeat my question. So are the calculations for
2 habitat loss in SR1, i.e. less than 1 percent of upland
3 and wetland cover types and 0.1 percent for native
4 upland correct, given that we have new calculations for
5 areas of sediment deposition presented for soils in
6 Exhibit 325?

7 A. MR. TERRY: Mr. Chairman, can I take a minute?
8 Ms. Okoye, could you give us the exhibit number?

9 Q. That was Exhibit 324, PDF pages 22 to 28. And the
10 specific number is for the upland and native habitat,
11 the percentages that I gave are actually on PDF page 28
12 of Exhibit 324.

13 A. MR. TERRY: And that page again, sorry, was?

14 Q. PDF 28. We can pull that up if that helps you. If you
15 look at PDF 28 under the summary of key information
16 column. Right there.

17 A. MR. TERRY: Right, yep. Right, so it's
18 referencing Table 1-8, and yes, subject to check, that
19 sounds reasonable.

20 Q. Okay. So you're saying that those percentages are
21 still correct even though there is new calculation for
22 areas of sediment depositions presented for soils?

23 A. MR. TERRY: Mr. Chairman, I believe the
24 Table 1-8 is referring the effects due to -- the
25 cumulative effects due to future projects from

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1 **construction.**

2 Q. Okay. So can you explain how there will be no change
3 in habitat loss when the sediment deposition area has
4 increased from 105 hectares in the EIA to 319 hectares
5 for early release scenario and 337 hectares for late
6 release?

7 A. **MR. BRESCIA:** Mr. Chairman, it's Dave Brescia.
8 If I could just point out, the numbers that are being
9 referred to in that table relate to the construction
10 phase of the project. So it doesn't -- it doesn't
11 account for sediment.

12 Q. Okay. So you're saying that that's different and
13 so -- all right.

14 So back to Mr. Terry, Mr. Terry, are you saying
15 that there is no change in habitat loss percentages for
16 habitat in SR1 based on the new calculations done for
17 soils?

18 A. **MR. TERRY:** Again, the increase in sediment
19 deposition would not change the conclusions of the
20 assessment related to change in the habitat loss.

21 Q. Okay. So, also in PDF 28 that we have up, so at the
22 bottom of that first row, you have "overall." Perhaps
23 we can increase the size, please, maybe one more.

24 Thank you.

25 So I'm just referring you to the bottom of the

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1 first row. You have: (as read)

2 "Overall, the potential for project
3 residual effects to act cumulatively
4 with the residual effects of future
5 projects on wildlife habitat are
6 relatively minor because the future
7 developments do not contain high value
8 wildlife habitat for many SOMC."

9 Does wildlife habitat have to contain high value
10 wildlife habitat or native species of management concern
11 for it to be considered impacted?

12 **A. MR. TERRY: Right. So that overall conclusion**
13 **is based on the existing conditions of those future**
14 **projects, and in particular, the Harmony community**
15 **development and some of the upgrades to the highways**
16 **where a lot of these lands are already sitting in**
17 **existing or previously disturbed areas that provide,**
18 **you know, relatively lower habitat for species.**

19 **Q. Okay. So, again, on that cumulative impacts, if you**
20 **look at that table that you have presented on PDF 28,**
21 **towards the top of that box, sorry, top of that row,**
22 **you acknowledge at PDF 28 that the landscape has**
23 **already been impacted which has reduced habitat**
24 **availability.**

25 What can you tell us about the conservation status

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1 of the Foothills Parkland natural subregion?

2 A. MR. TERRY: Sorry, can I take a minute,
3 please?

4 Q. Sure.

5 A. MR. TERRY: Ms. Okoye, I don't know the status
6 of that particular subregion.

7 Q. Mr. De Carlo, do you know?

8 A. MR. DE CARLO: Nick De Carlo speaking, Mr. Chair.
9 Could you repeat the question, Ms. Okoye?

10 Q. What can you tell us about the conservation status of
11 the Foothills Parkland natural subregion?

12 A. MR. DE CARLO: The conservation status, I don't
13 have the numbers in front of me. But there has been
14 meaningful conversion of the area to anthropogenic
15 uses. It may be approximately half, subject to check.
16 That is my understanding.

17 Q. So you think that there's only about half left that
18 have not been compromised in any form?

19 A. MR. DE CARLO: I wouldn't say -- I wouldn't
20 characterize it as not compromised in any form. I
21 would say that it's areas that remain native.

22 Q. Okay. So, in terms of percentage, do you know what the
23 percentage of the remaining native habitat have to be
24 impacted for you to consider the impacts significant?

25 A. MR. DE CARLO: Mr. Chair, I'm not aware of any

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1 threshold that has been identified by regulatory
2 agencies or in scientific publications specific to the
3 parkland, Foothills Parkland natural subregion.

4 Q. Mr. Terry, do you know what the percentage of the
5 remaining native habitats have to be impacted for
6 impacts to be considered significant?

7 A. MR. TERRY: Again, I would also add that that
8 would really vary with different species in terms of
9 what that threshold might be.

10 Q. Okay. So in your view, Mr. De Carlo, if you're
11 considering the project at the local landscape level or
12 at the Foothills Parkland natural subregion level,
13 would your calculation or your views change where the
14 percentage of the remaining habitats in a particular
15 context differ?

16 A. MR. DE CARLO: Mr. Chair, for the purposes of the
17 assessment, we assess significance using a regional
18 assessment area, which was a 15-kilometre buffer
19 applied to the PDA. I can provide the preference to
20 this specific exhibit if needed.

21 But the project is expected to affect less than
22 1 percent of the native area within the regional
23 assessment area, subject to check. And if the
24 assessment area was expanded to the Foothills Parkland
25 natural subregion, the magnitude would decrease

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1 further. And in the absence of a established
2 threshold, no, I would not expect that a significant
3 determination would result.

4 Q. Thank you, Mr. De Carlo.

5 Document manager, you can take the document down,
6 and I'll pick up the pace a little bit here.

7 So in Exhibit 64, PDF 355, and I'll read to you
8 what it says. If you feel that you need to bring it
9 up, feel free to ask. The Springbank project, PDF 355
10 of Exhibit 64 says: (as read)

11 "The Springbank project would store
12 floodwaters outside of the Elbow River
13 valley reducing environmental impacts to
14 the river corridor. At the same time,
15 it would provide benefits to downstream
16 communities including a reduction of
17 flood risk on the Bow River and the
18 South Saskatchewan River."

19 So, Mr. De Carlo, do you agree that the project would
20 reduce environmental impacts to the river corridor, and
21 if you do agree. Can you tell us why?

22 A. MR. DE CARLO: One moment, Mr. Chairman, I'd just
23 like to caucus.

24 Mr. Chair, I would say that it reduces some
25 effects. I'd point back to the IR 14 that we had up

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1 earlier in the characterization of the changes to the
2 riparian habitats with SR1 where you've got changes in
3 the erosion and channel morphology.

4 Q. Sir, can you tell me what part of the river corridor
5 would have reduced environmental impacts?

6 A. MR. DE CARLO: Areas that would have been subject
7 to extreme flooding, erosion, loss of vegetation as a
8 result, those areas would not be subjected to extreme
9 flooding and sediment deposition. And therefore, some
10 of those, particularly outside of riparian areas, would
11 have lower effects.

12 Q. So areas outside of the riparian areas would have lower
13 effects, but what about areas within the riparian
14 corridor?

15 A. MR. DE CARLO: Again, Mr. Chairman, I'd direct
16 back to our response for the previous IR of Number 14
17 where there will be altered effects.

18 Q. Sorry, which document are you referring to?

19 A. MR. DE CARLO: One moment, please, and I'll find
20 the exhibit number again.

21 Mr. Chair, that is Exhibit 138, PDF page 79.

22 Q. Perhaps, document manager, can you pull that up,
23 please? And at PDF pages what?

24 A. MR. DE CARLO: PDF page 79.

25 Q. So is there a map that you can use to show us are the

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1 part of the river corridor that you think will have
2 reduced environmental effects?

3 A. MR. DE CARLO: One moment, Mr. Chair.

4 A. MR. BRESCIA: So Mr. Chairman, it's
5 Dave Brescia.

6 I'd like to reiterate a point that Mr. De Carlo
7 brought up earlier. And what we've done to assess
8 cumulative effects is we've chosen a regional
9 assessment area, which is standard practice in
10 assessing cumulative effects. And that is based on a
11 15-kilometre buffer around the PDA for the project.
12 And we used that to -- to examine the effects of the
13 project and whether or not they interact with the
14 effects of other projects.

15 And the selection of that study area to assess
16 cumulative effects is consistent with guidance from the
17 federal impact assessment agency and is considered a
18 reasonable -- reasonable boundary within which to
19 assess those effects.

20 Q. So, Mr. Brescia, as a follow-up to your response, your
21 assessment of cumulative impacts. And I had earlier
22 referred to Exhibit 324, PDF 28, and you had jumped in
23 and said that that particular reference was talking
24 about construction impacts on -- so construction
25 impacts cumulatively.

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1 So did your analysis just stop at construction or
2 did you consider other effects outside of
3 construction -- sorry, did you consider accumulated
4 impacts of the project outside of construction?

5 **A. MR. BRESCIA:** **Mr. Chairman, it's Dave Brescia.**
6 **Yes, we did. So in the cumulative affects assessment,**
7 **we looked at the effects of construction and the**
8 **methodologies laid out in -- I will find it -- it is**
9 **Exhibit 58, is where the methodology is laid out, and**
10 **the initial assessment was split like the rest of the**
11 **EIA into construction and dry operations as one**
12 **assessment, and then flood and post flood operations as**
13 **the second assessment.**

14 And so the cumulative effects assessment that
15 looked at the interaction with surrounding projects
16 focused -- was focused on the construction and dry
17 operations, as the flood and flood operations is
18 unknown.

19 So we did, however, assess the effects of flood
20 and flood operations, but it was added to the effects
21 that were already considered in the construction phase
22 of the project, which dealt with the primary
23 interactions.

24 That was a somewhat complex answer and hopefully
25 it made some sense.

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1 Q. Thank you, Mr. Brescia.

2 So back to Mr. De Carlo, we were talking about
3 Exhibit 64, PDF 35, and the reduction of environmental
4 impact to the river corridor by the project.

5 I'm not sure I heard you tell me exactly the
6 environmental impacts within the river corridor that
7 would be reduced by the project. Would you mind going
8 over that and also explain to me how those
9 environmental impacts to the river corridor will be
10 reduced by the project?

11 A. MR. DE CARLO: Sure, Mr. Chairman. So, again,
12 going back to the definition of riparian areas, I would
13 submit that the entire river corridor is not riparian
14 and there will be areas outside of the riparian area
15 that would have flooded, such as in the 2013, the
16 upland flood areas, including wetlands that sit in
17 higher benches that would have been flooded in 2013,
18 they may have had sediment deposited, vegetation
19 removed, and with the Springbank Reservoir project and
20 the reduced flows in the river, those areas would be
21 less likely to be impacted.

22 THE CHAIR: Ms. Vespa, that was a little
23 quiet. Did you get that? Okay, thank you.

24 Sorry for the interruption.

25 MS. OKOYE: Thank you, Mr. Chair.

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Cross-examined by Ms. Okoye

1 Q. So in Exhibit 324, PDF 46, AT states: (as read)

2 "SR1 also provides a flood risk
3 reduction for communities along the
4 Bow River and South Saskatchewan rivers
5 (Downstream of the Elbow River
6 confluence) by removing up to 600 cubic
7 metres per second from the flood peaks
8 generated from the Elbow. Communities
9 receiving this benefit include the
10 Siksika Nation and even as far
11 downstream as the City of Medicine Hat."

12 And you also noted the reduction of flood risk in
13 Exhibit 64, PDF 355.

14 Can you tell me, Mr. De Carlo, how many miles of
15 riparian habitat along the Bow and South Saskatchewan
16 rivers may be impacted by these reduction in flood
17 peaks?

18 A. MR. BRESCIA: Mr. Chairman, it's Dave Brescia
19 again. I'm going to go back to something I had said
20 previously.

21 In the selection of the regional assessment area
22 that we used for our effects assessment on vegetation,
23 we used a 15-kilometre buffer around the project
24 development area and that provides an accurate
25 representation of the species and community

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1 compositions within the region, and it also aligns with
2 the wildlife assessment.

3 And selection of a buffer that aligns with a
4 wildlife species, like it does in this case, is
5 identified as an accepted method by the federal impact
6 assessment agency for assessing cumulative effects.
7 And we feel this is an appropriate choice for this
8 assessment.

9 Q. Thank you for that response, but you haven't answered
10 my question. My question is, how many miles of
11 riparian habitats along the Bow and Saskatchewan rivers
12 may be impacted by the reduction in flow peaks and
13 flood peaks?

14 A. MR. BRESCIA: Mr. Chairman, we haven't looked at
15 any effects downstream of the Glenmore Dam.

16 Glenmore Dam, in itself, is a flow control
17 structure, and what we did do, in terms of an
18 assessment of riparian effects, is presented in
19 Exhibit 138, and the IR number is 103, which is on PDF
20 page 474.

21 So we have provided an assessment of effects to
22 riparian areas along the stretch of the Elbow River
23 that goes from the project down to Glenmore Reservoir.
24 But because Glenmore Reservoir is a flow control
25 structure, we didn't extend that assessment beyond that

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1 point.

2 Q. Okay. So I'll go back again to Dr. Whitson, changing a
3 little bit here. Just ask a few questions on the land
4 capability, and I'll continue with the rest of my
5 questions.

6 So Exhibit 327, PDF 190, Dr. Whitson, you state
7 that: (as read)

8 "EIA stated that flood sediment would be
9 dominated by sand-sized particles with
10 sandy loam to sandy -- to sand textural
11 classes expected, whereas the updated
12 modelling shows a range of textural
13 classes from sand to heavy clay."

14 Can you tell me what caused the change in soil textural
15 classes from what it was in the EIA to what you
16 currently state in your report?

17 A. MR. WHITSON: Mr. Chair, the change came about
18 because of the early/late release modelling that was
19 done by the hydrology group.

20 And for reasons that I probably can't speak to,
21 the revised modelling shows that there's a spatial
22 distribution in the patterns of sediment deposition.

23 A. MR. WOOD: Mr. Chair -- Chairman, if I may.
24 This is Matt Wood. I can supplement Mr. Whitson's
25 response a little bit, although Mr. Luzi was

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1 responsible for that piece of the modelling.

2 What I can say is that the original modelling, due
3 to technological limitations at the time, utilized
4 multiple discrete models, one for the diversion
5 structure area, one for the channel, one for the
6 reservoir and the outlet.

7 Because they were discrete models, they couldn't
8 pass the data between them and it was a manual
9 exercise -- essentially a manual exercise of moving
10 them across, and so we couldn't carry that complexity
11 in the output.

12 Fortunately in the revised modelling, we were able
13 to do a more comprehensive, a more wholistic model, if
14 you will, that actually is able to compute some of that
15 separation of materials at the diversion structure and
16 then the resulted output was more comprehensive.

17 Q. Okay. Thank you.

18 Dr. Whitson, so what were the early and late
19 release timing scenarios in the EIA, in terms of days,
20 that a floodwater would remain in the reservoir?

21 A. MR. WHITSON: Mr. Chair, I'm -- I believe --

22 THE CHAIR: Who's speaking? Sorry.

23 A. MR. WHITSON: This is Ivan Whitson, sorry,
24 but --

25 THE CHAIR: I'm sorry. Go ahead. Sorry.

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1 A. MR. WHITSON: The information I have is from
2 Exhibit 218 and it's Table 1-1. I don't know the PDF
3 number, but it shows the dates of the early/late
4 release -- you might recall, but I think he used the
5 term "hold time." And so there's various date --
6 various periods of hold time. I can report them but
7 I'm probably not the person who should speak to them.

8 Q. No, that's fine. I just want to find out what it was
9 in the EIA and what release timing you used in your
10 revised modelling.

11 So perhaps you can tell me what release timing you
12 used in your revised modelling versus what was in the
13 EIA?

14 A. MR. BRESCIA: Mr. Chairman, it's Dave Brescia.
15 Perhaps I can pull those numbers up. They would be --
16 the numbers that Ivan used in the revised modelling are
17 in that Exhibit 218 that we referred to earlier, and
18 I'm getting the PDF page for that is PDF page 26. So
19 those are the numbers that were used for the updated
20 modelling.

21 Q. Thank you for that clarification.

22 Dr. Whitson, earlier you said the effect of soil
23 quality and quantity will still be of high magnitude
24 and irreversible. Do I have that correct?

25 A. MR. WHITSON: Mr. Chair, it will be high

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1 magnitude, and some of the soil properties are
2 irreversible; some of them remain reversible. For
3 instance, soil wetness is a reversible process. So the
4 soils can dry out afterwards. But the change in pH and
5 the deposition of sediment, those are irreversible
6 changes.

7 Q. Even with the application of mitigation measures, will
8 those irreversible impacts still remain after the
9 application of the mitigation measures?

10 A. MR. WHITSON: Mr. Chair, the mitigation measures
11 are intended to revegetate the system.

12 The soil properties, they can -- some of the soil
13 properties can be mitigated, nutrients can be added.
14 Over time, as vegetation is established, soil nutrient
15 cycling improves from the starting point of fresh
16 sediment. The textural properties won't change so
17 those are irreversible. But some of the dynamic soil
18 properties, the nutrients, that can be improved to
19 support vegetation growth. And I think other people
20 could speak to some more additional mitigations if
21 necessary to assist with revegetation and vegetation
22 health improvement and such.

23 Q. So, then -- sorry, I got distracted a little bit there.

24 I'm just going to reduce my volume a bit. So if I
25 heard you correctly, you said with the application of

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1 some mitigation measures that some of the soil quality
2 could change. Do I have that correct?

3 **A. MR. WHITSON:** Yes, that's correct. I wouldn't
4 foresee that the land capability class would ever
5 change. I would expect it to be somewhat stationary.

6 **Q.** So would you agree that successive flood events will
7 further degrade the flood quality and quantity in the
8 PDA?

9 **A. MR. WHITSON:** Yeah, I would agree that with
10 future floods, larger floods could introduce more
11 sediment, and you can see the trend based on the one
12 design flood event.

13 So I think it's intuitive that the continued
14 operation of the reservoir will -- the direction will
15 remain the same.

16 **Q.** So can you explain how successive flood events will
17 change the characteristics of the soil units that you
18 have shown in Table 1 of your report and the land
19 capability classification of the soil units that you
20 have shown in Table 2 of your report? And your report
21 is Exhibit, I believe, 327.

22 **A. MR. BRESCIA:** Mr. Chairman, it's Dave Brescia.
23 Perhaps I could provide a little context here when
24 we're talking about successive flood events.

25 When we're talking about successive flood events,

1 generally we're talking about small floods, small
2 floods that will occupy -- like, a 1 in 10-year flood
3 would be approximately -- flood approximately 20
4 hectares of the reservoir. The likelihood of having
5 successive large floods in any short timeframe is
6 extremely low. So we're talking about an effect over a
7 small area.

8 And I would also refer again to Mr. Hebert's
9 opening statement where he goes over the comprehensive
10 process that will be developed to reestablish
11 vegetation on the landscape.

12 The reestablishment of vegetation on the landscape
13 isn't going to be dependent on an LCC calculation
14 that's a land capability calculation; it's going to be
15 appropriate to the conditions that are measured on site
16 after the flood. So the LCC is a metric, but it's not
17 going to be a factor in determining what the
18 revegetation and mitigation measures will look like.

19 And, further, with the monitoring program that is
20 associated with that revegetation plan, that will
21 enable us to adaptively manage the conditions that
22 might occur from changes in soil properties that could
23 affect regrowth.

24 Q. Thank you, Mr. Brescia.

25 Dr. Whitson, I have asked specifically in relation

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1 to the characteristics of the soil units provided in
2 Table 1 of your report and the land capability
3 classification of the soil units in Table 2 of your
4 report.

5 And my question was how would successive flood
6 events, whether it's a larger flood or small flood
7 event, how would that change the characteristics that
8 you've shown in your endorsed tables to your reports?

9 **A. MR. WHITSON:** Mr. Chair, with respect to the
10 Table 1, those particular soil types refer to the late
11 release design flood, and they're based on one episode,
12 one event. And that's my estimation of what the
13 distribution of soil types after that event would be
14 approximately like.

15 I don't think I can provide a similar estimate of
16 what the soil distribution would be like after say two
17 large design events; that would be deeply into
18 speculation.

19 But what I identify with this Table 1 is kind of a
20 trend. Future floods would be similar in that there
21 would be an area near the outlet where larger sand
22 particles settle out. And that particular soil, if you
23 are discussing in terms of its quality, would have a
24 relatively low water-holding capacity.

25 But further out from that outlet, subsequent

1 floods would deposit materials of higher silt content
2 and considerably higher water storage capacity. And in
3 furthest out of all, clay particles will settle out of
4 the -- of those larger floods.

5 So the general pattern is that sandy soils near
6 the outlet, the entrance of the outlet, clay soils
7 furthest away, and then subject to obviously different
8 inputs of sediment vertically in the profile, you would
9 tend to develop soil properties, soil textures that
10 varied vertically, as well.

11 And to make a long story short, that vertical
12 gradation in texture would improve the water-holding
13 capacity considerably in these emerging soils.

14 I mean, you can look at the Elbow River floodplain
15 to see the general trend of what happens when you have
16 a short return period flooding, the soils remain in a
17 juvenile Regosolic soil state.

18 They don't have time to develop much topsoil, and
19 that's really kind of what we expect in the future in
20 areas where sediment is deposited. The soils will
21 remain in a fairly juvenile youthful state because
22 they'll always be essentially quite young. But the
23 textural properties will vary, and their water-holding
24 capacity will contribute to revegetation efforts.

25 Nutrients will be -- a nutrient will accumulate

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1 over time. This is not an agricultural system anymore.
2 And with the judicious use of amendments for soil
3 nutrients from time to time, we essentially establish a
4 nutrient capital in the soil. We're not hauling off
5 crops every year, and so that nutrient will accumulate
6 over time, and it will be a functional ecosystem where
7 there's a lot of human effort applied to make it so.

8 Q. Thank you, Dr. Whitson. Just one more question for
9 you; then I'll go on to sedimentation impacts.

10 So we have talked a bit, you have talked a little
11 bit about the different classes and textures of soil
12 that you can have occurring with this project.

13 And at PDF 191 of your report, you actually state
14 that: (as read)

15 "The finer textured soils are likely
16 easier to revegetate and manage than
17 areas of coarser texture."

18 I could be calling that wrong. Do you agree that that
19 statement that I just read to you is an
20 oversimplification of what will actually occur in the
21 project area?

22 A. MR. WHITSON: Mr. Chair, I think it's generally
23 well-recognized that coarse-textured soils don't store
24 very much water, and one of the major functions of soil
25 is to act as a storage reservoir of water for plants.

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1 And it's generally at the opposite end of the spectrum.
2 Silty and clay soils have much higher storage capacity
3 for water.

4 And so given we're in a somewhat drought-prone
5 environment, any soil that has a greater reserve of
6 soil water has less risk for revegetation troubles when
7 you're trying to reestablish vegetation. And so that's
8 the statement I was getting at.

9 There are other issues associated with
10 revegetating clay soils maybe that I wasn't thinking
11 about at the time. But just in terms of its ability to
12 provide water in the short term and in the long term,
13 every farmer would prefer to have a siltier clay soil
14 than a sandy soil.

15 Q. Can you tell me a little bit more about the
16 difficulties of revegetating a clay soil?

17 A. MR. WHITSON: Mr. Chair, I probably should
18 caucus with my fellows.

19 Revegetation itself is obviously about vegetation,
20 and I only speak to the soil aspects, what does the
21 soil provide for nutrients or water or does it have
22 other limitations. And I don't like to go much further
23 than that.

24 Q. All right. So in Exhibit 325, PDF 56.

25 MR. BARBERO: Ms. Okoye, sorry, it's

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1 Michael Barbero here, Mr. Chair. I just noticed that I
2 think my witness panel is caucusing. Are we all ready?

3 MS. OKOYE: I thought that Dr. Whitson had
4 already answered my question, and I'm moving on.

5 A. MR. WOOD: No, Mr. Chair, this is Matt Wood.
6 I don't believe he has. Maybe we can just finish our
7 caucus here.

8 MR. SECORD: And Ms. Okoye.

9 MS. OKOYE: Yes.

10 MR. SECORD: Ifeoma.

11 MS. OKOYE: Yes.

12 MR. SECORD: Would you call me, please?

13 MS. OKOYE: Sure, I will.

14 MR. SECORD: We can have a caucus, okay?

15 MS. OKOYE: Okay. Mr. Chair, if that's okay
16 with you, can I take a few minutes?

17 THE CHAIR: Yes, take a couple of minutes.

18 MS. OKOYE: Thank you. Okay, I'm ready to go,
19 Mr. Chair.

20 THE CHAIR: Sorry? You just froze, Ms. Okoye.
21 Does anybody else notice that? I think Ms. Okoye is I
22 think maybe lost now.

23 MR. WIEBE: She was invited to a breakout room
24 with Mr. Secord.

25 THE CHAIR: Oh, now she's back?

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1 MR. WIEBE: I'm assuming that -- no, I think
2 she never left, so she's probably figuring out the
3 breakout room right now.

4 MS. OKOYE: There we go. I thought that was a
5 request for me to join a breakout room, and I wasn't
6 sure why that was. I'm back.

7 Q. All right. Should I proceed, or you have a response
8 for me?

9 A. MR. HEBERT: Ms. Okoye, maybe if you could
10 repeat the question, then we'll ensure the panel can
11 respond.

12 Q. I believe I got the answer to my question, so I was
13 just going to move on.

14 A. MR. HEBERT: Okay. The Transportation witness
15 panel can continue.

16 Q. Thank you.

17 So Exhibit 164, PDF 7, Item 3.1.4, that is the
18 IAAC draft conditions, requires AT to install riprap
19 material on the diversion channel side slopes and where
20 the diversion channel enters the reservoir to prevent
21 future bank erosion. Do you recall that? I'm not sure
22 who the panel is going to answer for it.

23 A. MR. WOOD: Mr. Chair, it's Matt Wood. Yes, I
24 can confirm that. I'm aware of that draft condition.

25 Q. So and AT in its response, Exhibit 219, PDF 10, agreed

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1 that with the installation of the riprap but suggested
2 that the requirement should be limited to the diversion
3 channel and portions of the off-stream storage dam.

4 Now, can the diversion channel/berm and the dam
5 and outlet -- and at the outlet allow wildlife use and
6 passage while maintaining safety and reducing erosion
7 risk?

8 **A. MR. WOOD:** Mr. Chair, yes, I can confirm that
9 the riprap that, as I mentioned, has been modified in
10 many areas to facilitate wildlife passage. That
11 includes filling of the voids in that riprap with
12 gravels and cover.

13 And I guess with respect to -- sorry, what was the
14 second part of your question, Ms. Okoye?

15 **Q.** I think you've answered it. The question was whether
16 the diversion outlet channel and the riprap
17 installation will allow wildlife passage and use while
18 still maintaining safety and reducing erosion risk.
19 And I believe your answer is yes, it can serve both
20 purpose?

21 **A. MR. WOOD:** Correct.

22 **Q.** Do I have it wrong?

23 **A. MR. WOOD:** No, that would be correct, thank
24 you.

25 **Q.** So will there be spacing in between riprap to permit

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1 wildlife passage in all seasons so in winter, spring,
2 whenever?

3 A. MR. WOOD: Ms. Okoye, I'm not clear as to why
4 spacing in it would facilitate that. Could you please
5 explain?

6 Q. Perhaps you could explain to me how the installation of
7 riprap along the channel, diversion channel, for
8 instance, will permit wildlife passage and use?

9 A. MR. WOOD: Oh, Mr. Chair, this is Matt Wood.
10 As I mentioned, the plan for that riprap is to fill the
11 voids. So when I say the "voids," I mean all the
12 spaces in the riprap. Many of us have seen riprap
13 along the river, maybe tried to walk on it. It has
14 large holes in it that are not good for animals
15 specifically ungulates.

16 And so what's proposed is to fill the voids with
17 gravels so that those holes or those traps are not
18 present at areas where wildlife may wish to cross.

19 Q. Okay. So you're saying that wildlife can then cross
20 wherever there are gravel?

21 A. MR. WOOD: Correct.

22 Q. Is that what you're saying?

23 A. MR. WOOD: That is correct, yeah.

24 A. MR. BRESCIA: Ms. Okoye, if I could just add to
25 Mr. Wood's statement, it's not just gravel. The gravel

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1 will be covered with soil and vegetation.

2 Q. Okay. And that would be sufficient, I believe, is that
3 what you're saying, to reduce the erosion risk?

4 A. MR. WOOD: Yes, Mr. Chair. The size of the
5 riprap, the hydrotechnical analysis that was done, and
6 the placement and general arrangement of that riprap
7 doesn't change. It is simply that the voids are filled
8 with gravels and covered with soil and vegetation as
9 Mr. Brescia added to my response.

10 Q. Okay. And so the void in between the ripraps, will
11 that be wide enough to allow wildlife to pass?

12 A. MR. BRESCIA: Mr. Chairman, it's not the voids
13 that allow the wildlife to pass. The voids are filled
14 so that there are no holes, and then the holes are
15 revegetated so that it effectively looks like a grassed
16 slope. And so that's what enables the wildlife to
17 pass.

18 Q. I get that now, thank you.

19 So in Exhibit 94, PDF 151, AT acknowledges that
20 approximately 15.3 hectares of wetlands will be lost
21 during construction and 11.7 hectares will be lost from
22 post-flood sedimentation greater than 10 centimetre.
23 And then AT states that the lost wetlands will be
24 replaced.

25 Can you tell me the cost of replacing this

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1 27 hectares of permanently lost wetland?

2 **A. MR. DE CARLO:** Mr. Chairman, Nick De Carlo
3 speaking.

4 I don't have the numbers available to -- to
5 provide.

6 The compensation rate in the region is \$17,700 per
7 hectare, multiplied by a replacement ratio based on the
8 value of the wetland.

9 **Q.** Okay. So can you -- now, was that cost also included
10 in the -- in Exhibit 159, Appendix G? The cost for the
11 wetland replacement, was that included in the material?

12 **A. MR. SPELLER:** Mr. Chairman, Ms. Okoye, it's
13 Wayne Speller. The answer to that is no, it is not in
14 that cost opinion document.

15 **Q.** Okay. Thank you.

16 So does AT expect that there will be more wetlands
17 lost over time due to sedimentation as the project
18 operates?

19 **A. MR. DE CARLO:** Mr. Chairman, that would depend on
20 how the floods occur in the future. I don't believe we
21 are in a position to speculate as to how floods,
22 particularly design floods, will occur which could be
23 many, many years from now and would also be directly
24 related to the replacement approach agreed to between
25 AT and AEP.

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1 So, for example, some wetlands may be proactively
2 replaced in anticipation of sedimentation and effects
3 from future floods, and AT and AEP are currently
4 discussing what that replacement will look like and
5 what is desired.

6 Q. Okay. So that it's -- that's okay. So where exactly
7 will the replacement wetlands be located and
8 constructed?

9 A. MR. DE CARLO: Mr. Chairman, Nick De Carlo again.

10 That is a decision that is ultimately up to AEP.
11 They decide how the funds from wetland replacement are
12 allocated and where.

13 However, following the wetland policy and the
14 replacement mitigation directive, there is a preference
15 for wetland replacement to be conducted in the county
16 followed by the watershed where the loss occurs,
17 although that is not always possible, and the directive
18 recognizes that.

19 Q. So can you explain AT's confidence level regarding the
20 replaced wetlands being of similar productivity and
21 type such that the replaced wetlands will provide
22 100 percent replacement in terms of composition,
23 quality and ecosystem structure?

24 A. MR. DE CARLO: Mr. Chairman, Nick De Carlo again.

25 The province has a very rigorous process when it

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1 comes to evaluating wetlands, their function and value,
2 and that factors into the replacement costs. They have
3 replacement ratios based on the values, and those
4 values and those tools have gone through a rigorous
5 scientific review.

6 So the actual guarantee, I can't say that, but
7 they -- AEP does go through an independent review of
8 how funds are applied and the function of wetlands that
9 are either replaced or restored or adjusted using funds
10 from projects and *Water Act* approvals.

11 Q. So can you provide examples of Foothills Parkland
12 wetlands that have been reconstructed that you know of?

13 A. MR. DE CARLO: No, Mr. Chairman, I can't. AEP
14 does not make that information public. It may be
15 public in the future but I am not aware of any
16 information that AEP has made public to date.

17 Q. So does AT agree that flood risks are likely operation
18 of the project will be in the spring and summer when
19 the PDA will likely be in use by migratory birds and
20 wildlife?

21 A. MR. BRESCIA: Mr. Chairman, it's Mr. Brescia.
22 We would agree that it's -- the likely flood season
23 overlaps with potential migratory bird season.

24 Q. Thank you. So during cross-examination by Mr. Secord
25 on Topic Block 3, Mr. Menninger indicated that AT had

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1 built safety features into the project design,
2 including signage, warnings informing of the public
3 before operating the dam.

4 Can you tell me the safety plans that AT has in
5 place for ensuring the safety of wildlife, including
6 migratory birds, elk and grizzlies, that may be using
7 the reservoir area prior to the operation of the
8 project?

9 **A. MR. BRESCIA:** Mr. Chairman, this is
10 **Dave Brescia.**

11 So in the context of migratory birds, Alberta
12 Transportation has been in discussions with Environment
13 Canada and the Federal Impact Assessment Agency about
14 appropriate mitigation for potential effects to
15 migratory birds.

16 Through that -- and this information is in the
17 filed material -- the federal agency's proposed the
18 idea of monitoring and salvage plan as an option
19 to -- for AT to consider developing to minimize these
20 effects.

21 That salvage plan, the draft of it is presented in
22 Exhibit 218 and PDF page 98, and it outlines the steps
23 that are involved in the salvage operations including
24 the flood forecasting which would be information
25 provided by Alberta Environment and Parks, the salvage

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1 operation, the identification of salvage areas, and --
2 and measures to -- to get the migratory birds to a
3 rehabilitation centre if necessary.

4 So that plan has been drafted and will need to be
5 progressed further in consultation with both
6 Environment Canada and Alberta Environment and Parks.

7 Q. Thank you. So during a flood event, can you tell us
8 the steps that AT will take to remove any wildlife that
9 may be stranded in the off-stream reservoir or in any
10 of the project's components?

11 A. MR. BRESCIA: Mr. Chairman, this is
12 Dave Brescia.

13 So, as I mentioned, so we've developed a draft
14 migratory bird salvage plan, and some of the steps
15 involved are that AEP, river engineering and technical
16 services, we've spoken with them about flood
17 forecasting, and they've indicated that they are able
18 to provide some notice -- it's a short period of time,
19 on the order of two to three days -- of an impending
20 flood that would have flows that would trigger the
21 operations of the project.

22 Following that notification, crews -- and this
23 would follow a process much the same as the fish
24 salvage process that we talked about in Topic 4. Crews
25 would be mobilized to the reservoir to identify

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1 priority areas. And those priority areas are based on
2 known habitat types and breeding bird densities that we
3 would expect to be the most likely to have migratory
4 birds.

5 Following that, birds that were encountered would
6 be salvaged, and they would be -- a process -- they
7 would be -- through a process pre-arranged, they would
8 be taken to recovery centres, wildlife recovery centres
9 in the region for rehabilitation.

10 And through this plan also, we would be looking
11 for amphibian species at risk. Should we encounter any
12 amphibian species at risk, they would be relocated to
13 areas outside of the flooded part of the reservoir.

14 And it should be noted that we did not see any
15 amphibian species at risk during our wildlife surveys.
16 But should they be there.

17 With respect to the larger more mobile wildlife,
18 like ungulates, we wouldn't expect there to be any real
19 issue with them exiting the reservoir under their own
20 power.

21 Q. Thank you, Mr. Brescia. So your explanation relates to
22 pre-flood events. I'd like to get your take on what
23 the plan is for -- during flood in terms of wildlife
24 rescue.

25 A. MR. BRESCIA: When I say "pre-flood events," I'm

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1 referring to, quite immediately, pre-flood, so,
2 effectively, on the front end of the flood.

3 I don't think there's any plans to go into the
4 reservoir when it's full of water to attempt to rescue
5 anything currently planned.

6 Q. So in the event that there are some wildlife that are
7 trapped in there, that maybe, for some reason, your
8 plan wasn't effective in getting them out before the
9 flood or you did get some out before the flood, but
10 some entered after you had finished your operation, do
11 you acknowledge that mortality could result in that
12 situation?

13 A. MR. BRESCIA: Mr. Chairman, I'm not sure that
14 I'm following the reason why wildlife would enter the
15 area and become trapped while it was flooded. Our
16 expectation is that animals that -- that -- would avoid
17 the area during a flood and that's what we've
18 identified in our wildlife movement assessment is that
19 while the area is flooded, we expect them to move out
20 of the area. That's our assessment.

21 Q. So there is no assessment on the potential for any
22 wildlife to either get in there during a flood event,
23 which could last for days, and also before the release
24 event occurs, is it that there's no expectation that
25 there would be any wildlife getting in there?

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1 A. MR. BRESCIA: Mr. Chairman, I think I'm having
2 trouble following the mechanism by which they would get
3 into the reservoir. Either the expectation would be
4 they would be species that would be adapted to aquatic
5 environments, perhaps like waterfowl or amphibians, or
6 they would be species that would move away
7 instinctively from the water.

8 So I'm not certain how they would get -- get
9 trapped again and die.

10 Q. Okay. So my clients would like to know which wildlife
11 cannot exit the area. So if you can talk about that a
12 bit.

13 A. MR. BRESCIA: One moment.

14 A. MR. TERRY: Mr. Chairman, Eliot Terry. So
15 we've said an assessment basically is during a flood
16 operation that animals that have relatively lower
17 mobility, so things like amphibians, as Mr. Brescia
18 mentioned, and ground-nesting birds would be at most
19 risk.

20 Other animals, right, that have higher mobility,
21 mammals, the ungulates, and other species, are expected
22 to move away from the floodwaters reducing their
23 mortality risk. But we've acknowledged that there is a
24 risk, but that will obviously depend on again the
25 magnitude of the flood and the mobility of those

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Cross-examined by Ms. Okoye

1 **wildlife species.**

2 Q. So in terms of bird nests, so I take it that the plan
3 is to actually go in and scan for bird nests and get
4 them all out? Is that the intention?

5 A. **MR. TERRY:** **Yes, as Mr. Brescia explained. So**
6 **we'll have identified priority habitat areas where the**
7 **density of the birds will be relatively higher, to**
8 **focus our efforts in that limited amount of time**
9 **available. And so that would be the plan.**

10 **We can't obviously rescue all birds, but the plan**
11 **is to attempt to do the best we can, within the time**
12 **available.**

13 Q. Okay. Thank you. So in your opening statement,
14 Mr. Hebert, you indicate that AT will consider the
15 addition of shelter belts at select -- AT will consider
16 the addition of shelter belts at select areas of the
17 PDA or adjacent landowners' requests.

18 **Will AT establish the trees along the embankment**
19 **in the floodplain berms and the off-streams dam**
20 **embankments?**

21 A. **MR. WOOD:** **Mr. Chairman, due to engineering**
22 **reasons, geotechnical maintenance and monitoring**
23 **reasons, things like trees and shrubs are not permitted**
24 **in the dam, the floodplain berm or the diversion**
25 **channel embankments.**

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Cross-examined by Ms. Okoye

1 Q. So you're saying that there won't be any trees along
2 the embankment on the floodplain berm?

3 A. MR. WOOD: There will not be any trees along
4 the -- on the embankment of the floodplain berm. It is
5 classified as a dam, as was discussed in previous days,
6 and trees are not good to be having growing out of
7 dams.

8 Q. Okay. And so there will also be no trees along
9 the -- sorry, I think you've answered that. Sorry.

10 So at what stage of the construction process will
11 AT commence the planting of the trees and where exactly
12 would those trees be planted, or is that not known at
13 this time?

14 A. MR. HEBERT: Mr. Chairman, that level of detail
15 is not known at this time, as I said in my opening
16 remarks. That's subject to discussions with adjacent
17 landowners around the PDA.

18 Certainly there may be some other locations that
19 may be appropriate for the location of shelter belts as
20 the plan of the project continues, but certainly I
21 would expect that those details would come at a point
22 after project approval, should the Board and the
23 federal regulator agree.

24 But, again, it's a matter that -- obvious that
25 requires discussion with those that will continue -- or

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Cross-examined by Ms. Okoye

1 choose to live -- or choose to be adjacent to the
2 project area and certainly we'd be open to their views
3 on -- if they're interested when they would expect
4 planting to begin.

5 Q. So when the trees are established, would AT or AEP be
6 solely responsible for the costs of maintaining the
7 shelter belt trees?

8 A. MR. HEBERT: Mr. Chairman, I say it's premature
9 at this time to confirm who would be responsible for
10 their management depending on their location and
11 purpose, but certainly, we would be pleased to confirm
12 those details at a later time.

13 Q. Okay. So will AT agree to include as a condition of
14 approval that AT will establish and maintain the
15 shelter belt trees at its own costs following
16 consultation with local stakeholders and adjacent
17 landowners?

18 A. MR. HEBERT: Mr. Chairman, we will take that as
19 an undertaking.

20 UNDERTAKING - TO ADVISE IF AT WILL
21 AGREE TO INCLUDE AS A CONDITION OF
22 APPROVAL THAT IT WILL ESTABLISH AND
23 MAINTAIN THE SHELTER BELT TREES AT ITS
24 OWN COSTS FOLLOWING CONSULTATION WITH
25 LOCAL STAKEHOLDERS AND ADJACENT

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Cross-examined by Ms. Okoye

1 **LANDOWNERS**

2 Q. MS. OKOYE: So does AT agree to also have as a
3 condition of approval that AT shall compensate all
4 farmers with documented expenses for incremental weed
5 control as a result of project activities?

6 A. MR. HEBERT: Mr. Chairman, we'll add that to
7 the undertaking.

8 **UNDERTAKING - TO ADVISE IF AT WILL**
9 **AGREE TO HAVE AS A CONDITION OF**
10 **APPROVAL THAT IT SHALL COMPENSATE ALL**
11 **FARMERS WITH DOCUMENTED EXPENSES FOR**
12 **INCREMENTAL WEED CONTROL AS A RESULT OF**
13 **PROJECT ACTIVITIES**

14 Q. MS. OKOYE: So the SCLG acknowledges that AT
15 has conducted some baseline biodiversity surveys,
16 inventories, and analysis of the project's impacts on
17 wildlife plans. What about a soil and migratory bird
18 habitats? SCLG views the surveys done are not fulsome,
19 and more information are required.

20 Does AT agree to a condition of approval that
21 would require AT to work with landowners, local
22 stakeholders, including First Nations, in identifying
23 additional biodiversity studies that should be done and
24 undertake to do them?

25 A. MR. HEBERT: Mr. Chairman, one moment.

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Cross-examined by Ms. Okoye

1 Ms. Okoye, are you able to clarify the meaning of
2 "study" in this instance?

3 Q. So surveys, additional surveys, additional work in the
4 event arising and identifying habitats and presence of
5 wildlife and other types of biodiversity issues.

6 A. MR. HEBERT: Just bear with us one moment.

7 THE CHAIR: Ms. Okoye, just while we're
8 waiting on caucus, whereabouts are you on your
9 questions?

10 A. MR. HEBERT: So Mr. Chairman, generally
11 speaking, I believe what counsel is referring to could
12 or would be captured within monitoring mitigation plans
13 that have been posed. But for the benefit of
14 Ms. Okoye's clients we can undertake to provide a
15 written response.

16 Q. Okay. Thank you.

17 UNDERTAKING - TO ADVISE IF AT AGREES TO
18 A CONDITION OF APPROVAL THAT WOULD
19 REQUIRE ALBERTA TRANSPORTATION TO WORK
20 WITH LANDOWNERS, LOCAL STAKEHOLDERS,
21 INCLUDING FIRST NATIONS, IN IDENTIFYING
22 ADDITIONAL BIODIVERSITY STUDIES THAT
23 SHOULD BE DONE AND UNDERTAKE TO DO THEM

24 MS. OKOYE: Mr. Chair, yeah, I notice that we
25 are getting close. I was hoping to get -- I still have

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Cross-examined by Ms. Okoye

1 just about four more questions, and then I can turn it
2 over to Mr. Secord. Or he could start in the morning,
3 and then I'll check in with my clients, and I may
4 have -- any additional questions I can fill them
5 through Mr. Secord.

6 **THE CHAIR:** Okay. So yeah, I think continue
7 with your questions, and then we'll ask Mr. Secord
8 where he wants to go because we'll be close to 5:30 at
9 that point. And if we need to sit longer or if there's
10 a desire by all parties, we could, but I think we had
11 previously agreed 5:30 and then start tomorrow morning.

12 But continue, please, Ms. Okoye. Thank you.

13 **MS. OKOYE:** Thank you, Mr. Chair. I apologize
14 it's taken a bit of time.

15 **Q.** So does AT agree to also work with local stakeholders
16 and First Nations in identifying additional mitigation
17 measures to deal with any unforeseen biodiversity
18 impacts?

19 **A. MR. HEBERT:** Sorry, one moment. Ms. Okoye, can
20 you give us an example? We're just conferring here,
21 and we're just trying to get some context for --

22 **Q.** So in the event that you end up doing additional
23 surveys and inventories of wildlife and migratory birds
24 and other habitats that you find as a result of your
25 additional survey, so -- which will require you to

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Cross-examined by Ms. Okoye

1 undertake some mitigation measures to deal with those
2 additional impacts, do you agree to work with local
3 stakeholders and First Nations in identifying what
4 those additional mitigation measures will be?

5 **A. MR. HEBERT:** So as I said, I believe speaking
6 generally the product of the monitoring on project area
7 at either varying stages of its operation, should there
8 be the need for additional mitigation, Transportation
9 would have to apply it consistent with the results of
10 the monitoring program.

11 But I think certainly for the benefit of your
12 clients, we can include that as part of our response.

13 **UNDERTAKING - TO ADVISE IF ALBERTA**
14 **TRANSPORTATION WILL WORK WITH LOCAL**
15 **STAKEHOLDERS AND FIRST NATIONS IN**
16 **IDENTIFYING WHAT ADDITIONAL MITIGATION**
17 **MEASURES REGARDING SURVEYS AND**
18 **INVENTORIES OF WILDLIFE AND MIGRATORY**
19 **BIRDS AND OTHER HABITATS WILL BE**

20 **Q. MS. OKOYE:** So does AT agree to the
21 development of a grizzly bear monitoring and management
22 plan in consultation with local stakeholders in
23 proximity to the project area?

24 **A. MR. HEBERT:** Let me confirm one detail for a
25 moment. I was just checking.

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Cross-examined by Mr. Secord

1 As I suspected, I knew the answer, Mr. Chairman.
2 But we would submit to the panel that that particular
3 plan as it relates to grizzly bears would be captured
4 within the draft wildlife monitoring mitigation plan.
5 I don't know if that's the exact title, but I think I
6 came pretty close.

7 It's certainly the finalization of that plan is
8 subject to engagement with Indigenous groups and
9 interested stakeholders. And you know, I think we've
10 certainly made commitments that we're open to discuss
11 that plan through the life of the project as
12 appropriate.

13 Q. I'll check in with my client, and I'll turn it over to
14 Mr. Secord. And he can start or say what he wants to
15 do for now while I check in.

16 MR. SECORD: Sure. I can start asking some
17 questions, Mr. Chair, if you would like and many -- why
18 don't I do that? I've got a few questions that I
19 wouldn't mind asking before we break.

20 THE CHAIR: Sure.

21 MR. SECORD CROSS-EXAMINES THE PANEL:

22 Q. So probably, Ms. Noble, this might be -- these
23 questions might be for you.

24 I take it you've done the human health risk
25 assessment?

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Cross-examined by Mr. Secord

1 **A. MS. NOBLE:** **Yes, I have.**

2 **Q.** Right. And I take it you would be familiar with the
3 Health Canada website as part of your work?

4 **A. MS. NOBLE:** **Yes.**

5 **Q.** And you would have an understanding of PM 2.5?

6 **A. MS. NOBLE:** **Yes.**

7 **Q.** Okay. And would it be fair to say that PM 2.5 is
8 responsible for an estimated 4.2 million premature
9 deaths every year globally?

10 **A. MS. NOBLE:** **I'm aware that Health Canada, as**
11 **well as the World Health Organization and other health**
12 **agencies, have done estimates of the high cost of**
13 **exposure to air pollution.**

14 **I don't know the exact numbers, but I am aware of**
15 **those studies, yes.**

16 **Q.** And in Canada, can you confirm that about 6,000 people
17 die every year from air pollution according to
18 estimates from Health Canada?

19 **A. MS. NOBLE:** **Subject to check, if you can**
20 **provide a reference.**

21 **Q.** No, I'm just -- I'm not providing a reference; I'm just
22 wondering in terms of your work as a health risk
23 assessor, have you come across that type of statistic
24 from Health Canada? If you haven't, then you can just
25 say no.

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Cross-examined by Mr. Secord

1 **A. MS. NOBLE:** As I said before, I'm aware that
2 there have been estimates made about the rates of
3 illness and disease, but I don't know those numbers off
4 the top of my head.

5 **Q.** And among the different types of air pollution, can you
6 confirm that PM 2.5 kills the most people worldwide?

7 **A. MS. NOBLE:** I would hesitate to confirm that.
8 I do know that in terms of health estimates,
9 particulate matter is certainly one of the primary
10 criteria contaminants. The other as being, for
11 example, nitrogen dioxide.

12 **Q.** And can you confirm, Ms. Noble that PM 2.5 consists of
13 particles smaller than approximately 2.5 microns?

14 **A. MS. NOBLE:** Yes, that's by definition.

15 **Q.** Can you confirm that these particles are so small that
16 billions of them can fit inside a single red blood
17 cell?

18 **A. MS. NOBLE:** I would have to check on that.
19 That's certainly not a form of measurement that I have
20 ever used to estimate PM 2.5.

21 My standard form of reference is the human hair is
22 about 70 microns, and so 2.5 would be less than that.

23 **Q.** And can you explain, what is the -- what is the
24 mechanism for 2.5 killing people?

25 **A. MS. NOBLE:** So when it comes to the actual

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Cross-examined by Mr. Secord

1 mechanisms, there's a number of studies that have
2 identified potential rates for fatalities, but I'm not
3 sure that those have been formally confirmed. However,
4 when it comes to doing the risk assessment, we tend to
5 work at the -- at the comparison of appropriate
6 benchmarks.

7 What I can tell you is that, yes, Health Canada
8 has confirmed that the potential effects of exposure of
9 particulate matter relate to respiratory and
10 cardiovascular effects, of both morbidity and
11 mortality.

12 Q. Perhaps maybe the general question to the panel,
13 Mr. Hebert, for you to quarterback. Could I ask the
14 panel if they have seen a dry dam project like this
15 where perhaps millions of tons of sediment is
16 intentionally deposited and left to dry over a project
17 life of 100 plus years?

18 A. MR. HEBERT: One moment, Mr. Chairman.

19 A. MR. SPELLER: Mr. Chairman, Mr. Secord, it's
20 Wayne Speller.

21 Instead of passing it around to different people,
22 I think I'll take a shot, so...

23 Q. You're not up on the screen yet. There you are. Thank
24 you.

25 A. MR. SPELLER: I keep thinking it's a touch

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Cross-examined by Mr. Secord

1 screen. I can just poke my face on the screen and I'll
2 pop up for you.

3 So we are aware of projects where water levels and
4 dams and reservoirs are lowered and raised. We're not
5 aware of a dry dam of this size. We're also not aware
6 of any of those where the proponent has made a
7 commitment to sediment management, the way that we
8 heard Mr. Hebert speak about it earlier today.

9 Q. And what is the project life of this dry dam?

10 A. MR. HEBERT: Mr. Chairman, the project's life
11 is essentially indefinite. I don't believe that it's
12 got a fixed life.

13 Q. So it could be hundreds of years?

14 A. MR. HEBERT: Yes, Mr. Chairman, presumably
15 that's --

16 Q. It doesn't have a shelf life, Mr. Hebert; right?

17 A. MR. HEBERT: No, Mr. Chairman. And we've been
18 pretty clear in documentation that the project's life
19 and function is meant to be indefinite, again subject
20 to all the appropriate maintenance and compliance
21 requirements.

22 Q. Right. And in Alberta Transportation's report dated
23 March 11, 2021, from your own air quality experts, it
24 clearly states that there will be -- and I quote:
25 (as read)

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Cross-examined by Mr. Secord

1 "Unacceptable short-term risk to human
2 health due to unsafe air quality
3 levels."

4 What my clients would like to know is, why are you
5 creating an air quality problem that needs to be
6 managed? Why are you choosing this outcome with likely
7 air quality exceedances over hundreds of years? Why
8 would you intentionally create an air quality problem in
9 a community like Springbank when there are alternatives
10 like MC1 that could have avoided this outcome?

11 **A. MR. SPELLER:** Mr. Chairman, Mr. Secord, I just
12 want to clarify two things that were just spoken to.

13 So I know, Mr. Secord suggested that what he just
14 said was a quote. That's not actually in our report
15 the way that he worded it.

16 He stated it "will" have effects. That's actually
17 not what our conclusions are. We've seen that in some
18 of the documentation. That's not what our exhibit
19 states. It says it "could," and then it talks about
20 some other factors.

21 The second piece I wanted to clarify. There has
22 been discussions for this project during this hearing
23 about the MC1 option as another option. I'm not sure
24 that's what Mr. Secord was talking about.

25 But one thing to be clear is, as at its conceptual

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Cross-examined by Mr. Secord

1 stage, as it was proposed back in the day, it's also a
2 dry dam, water levels will rise over a much larger area
3 than that permanent pond, that water will -- water
4 levels will reduce, sediment will be left behind and
5 would have to be managed.

6 So I just want to make those two clarifications.
7 That's not the answer to your question, but I wanted to
8 clarify those two pieces.

9 Q. But there isn't a school a few kilometres downstream of
10 MC1, is there?

11 A. MR. HEBERT: No, Mr. Chairman, there is not;
12 however, I think what we would suggest, as part of
13 Alberta Transportation, is the commitments that I
14 referred to in my remarks earlier today as it relates
15 to the management of sediment, as it would relate to
16 the air monitoring that we've proposed. We've also
17 been addressing other mitigations that would reduce the
18 risk to residents in the area.

19 Transportation is not denying the potential risks,
20 but on account of knowing that this is a risk that
21 could accrue on account of its operations,
22 Transportation has proposed a set of management
23 techniques to reduce or eliminate the risk to the
24 population.

25 A. MR. SPELLER: Mr. Secord, sorry, if I could add,

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Cross-examined by Mr. Secord

1 again another clarification.

2 The discussion about the school, we saw that in
3 some of the documentation. It was quite alarming when
4 we saw it as -- it's not the findings of our
5 assessment, it's not what we're seeing in the findings
6 of the old modelling we did, the new modelling we did,
7 the frequency work that we did, Ms. Noble's health risk
8 assessment.

9 That -- that kind of supposition of what that
10 outcome could be is alarming. We were equally alarmed
11 because it's not what our assessment concludes.

12 Q. So in your experience, Ms. Noble, what period of time
13 did your education or professional groups designate as
14 an acceptable period of time that young children should
15 be exposed to unsafe air quality?

16 A. **MS. NOBLE:** Children should not be exposed to
17 unsafe air quality, nor should the elderly, nor should
18 members of the public.

19 Q. And in terms of your education and professional -- in
20 your experience and education, what period of time did
21 your education and professional groups designate as an
22 acceptable period of time for people with pre-existing
23 respiratory health issues to be exposed to unsafe air
24 quality?

25 A. **MS. NOBLE:** So people should not be exposed to

ALBERTA TRANSPORTATION TOPIC #5 PANEL

Cross-examined by Mr. Secord

1 unsafe levels.

2 The question becomes determining the risk in terms
3 of what constitutes an unsafe level.

4 MR. SECORD: Mr. Chair, I think we've reached
5 probably a logical place to break for the evening,
6 unless you would like me to go on. I have an area of
7 cross that would probably take quite a bit of time that
8 I could embark on but...

9 THE CHAIR: I think -- well, I think tomorrow
10 should work. I mean, I have you at just around 100
11 minutes for tomorrow in terms of your time allocation,
12 Mr. Secord.

13 And, you know, I think -- let's see how the
14 morning goes, and we could take maybe -- if people
15 could be prepared to take a half hour lunch if we do
16 fall behind just a little bit tomorrow morning, and
17 then if we need to sit a bit longer tomorrow, we will.
18 But I think we should be close. And that will depend a
19 bit, because right now Alberta Transportation, as I
20 mentioned earlier, would be giving up some of their
21 requested approved -- pre-approved cross time.

22 And we have noted -- Mr. Secord, you noted that
23 they, in the past, have not used all of that time, but
24 they might in this case. I mean, I don't think we
25 should predispose that.

1 So let's go with that tomorrow, but we should be
2 prepared to perhaps have a shorter lunch break
3 tomorrow, and be prepared to sit a bit longer tomorrow
4 as well, because we'll be that close, I think. And if
5 we're all fairly diligent about our timing, that we
6 could complete the evidentiary portion tomorrow, which
7 I think I've heard from all parties is sort of the
8 desired outcome for tomorrow. So if we all work to
9 that goal, I think we ought to get there.

10 MR. SECORD: Thank you, sir.

11 THE CHAIR: Thank you, everyone. Let's
12 adjourn for the evening and we'll see you tomorrow
13 morning, 7:45 sign-in and 8:30 start. Thank you.

14 _____

15 PROCEEDINGS ADJOURNED TO APRIL 1, 2021, AT 8:30 A.M.

16 _____

1 Certificate of Transcript

2

3 We, the undersigned, hereby certify that the foregoing
4 pages 1895 to 2186 are a complete and accurate transcript
5 of the proceedings taken down by us in shorthand and
6 transcribed from our shorthand notes to the best of our
7 skill and ability.

8 Dated at the City of Calgary, Province of Alberta, on
9 March 31, 2021.

10

11

12

"Lorelee Vespa"

13

Lorelee Vespa, CSR(A) RPR CRR

14

Official Court Reporter

15

16

"Deanna DiPaolo"

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Deanna DiPaolo, CSR(A)

18

Official Court Reporter

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- I N D E X -

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7	MR. FITCH CROSS-EXAMINES THE PANEL	1906
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EXHIBITS

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3	EXHIBIT 386 - AT UNDERTAKING RESPONSES TO 10, 12,	1899
4	13, 15, 19, 21, 22, 23	
5		
6	EXHIBIT 387 - AT AID TO CROSS NUMBER 3	1923
7		
8	EXHIBIT 388 - SCLG AID TO CROSS NUMBER 2	1938
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10	EXHIBIT 389 - ALBERTA TRANSPORTATION TOPIC 4 AID	1942
11	TO CROSS 1, CTV NEWS ARTICLE	
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15	EXHIBIT 391 - ERRATA 1 FOR EXHIBIT 327 - REVISED	2037
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17		
18	EXHIBIT 392 - REID PERSON POWERPOINT	2072
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21	WATER COUNCIL RIPARIAN LAND CONSERVATION EXCERPT	
22		
23		
24		
25		

UNDERTAKINGS GIVEN

1

2

3 UNDERTAKING - TO HAVE MR. FENNEL CHECK THE 2025
4 TRANSCRIPT EXCHANGES WITH MR. BARBERO AND PROVIDE
5 CORRECTIONS TO ANY OF THE QUESTIONS AND ANSWERS
6 THAT MIGHT BE CHANGED AS A RESULT OF THE NEW
7 INFORMATION PROVIDED

8

9 UNDERTAKING - TO ADVISE WHY THERE WAS A PROPOSAL 2075
10 IN 2018 REGARDING ADDING THE SEGMENT OF HIGHWAY 22
11 BETWEEN HIGHWAY 1 AND HIGHWAY 8 TO THE HIGH LOAD
12 CORRIDOR NETWORK

13

14 UNDERTAKING - IF IT IS DETERMINED THAT THE SEGMENT 2075
15 OF HIGHWAY 22 BETWEEN HIGHWAY 1 AND HIGHWAY 8 HAS
16 BEEN ADDED TO THE HIGH LOAD CORRIDOR NETWORK, TO
17 ADVISE WHEN THAT OCCURRED

18

19 UNDERTAKING - TO ADVISE IF AT WILL COMMIT TO 2088
20 SOURCING AND USING ONLY WEED-FREE CONSTRUCTION
21 MATERIALS AT THE SITE

22

23

24

25

1 UNDERTAKING - TO ADVISE WHETHER THE OPERATION OF 2111
 2 THE FILTRATION SYSTEM CAN BE LIMITED TO DRY OR
 3 NON-FLOOD CONDITIONS

4

5 UNDERTAKING - TO ADVISE OF ANY RESTRICTIONS THAT 2111
 6 WILL MAKE THE DESIGN AND INSTALLATION OF THE
 7 FILTRATION SYSTEM NOT FEASIBLE

8

9 UNDERTAKING - TO PROVIDE A REVISED TABLE THAT WILL 2129
 10 SHOW THE HECTARES OF LAND THAT ARE AFFECTED BASED
 11 ON THE REVISED CALCULATION BY MR. WHITSON -
 12 REFUSED

13

14 UNDERTAKING - TO ADVISE IF AT WILL AGREE TO 2171
 15 INCLUDE AS A CONDITION OF APPROVAL THAT IT WILL
 16 ESTABLISH AND MAINTAIN THE SHELTER BELT TREES AT
 17 ITS OWN COSTS FOLLOWING CONSULTATION WITH LOCAL
 18 STAKEHOLDERS AND ADJACENT LANDOWNERS

19

20 UNDERTAKING - TO ADVISE IF AT WILL AGREE TO HAVE 2172
 21 AS A CONDITION OF APPROVAL THAT IT SHALL
 22 COMPENSATE ALL FARMERS WITH DOCUMENTED EXPENSES
 23 FOR INCREMENTAL WEED CONTROL AS A RESULT OF
 24 PROJECT ACTIVITIES

25

NRCB 1701, Volume 8, March 31, 2021

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\$17,700 [1] - 2161:6								
1								
'30s [1] - 1931:21 '32 [1] - 1930:5 'weight [1] - 1986:23								
0								
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