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NATURAL RESOURCES CONSERVATION BOARD

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Application No. 1701

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SPRINGBANK OFF-STREAM RESERVOIR PROJECT

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P R O C E E D I N G S

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Volume 1

20

March 22, 2021

21

(Afternoon Session)

22

(Via videoconferencing)

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

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4 Volume 1 - Afternoon Session

5 March 22, 2021

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Walter Ceroici	Commission Member
Daniel Heaney	Commission Member

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25

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

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

6

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

8

9 (Proceedings re-commenced at 12:59 p.m.)

10 THE CHAIR:

Okay, Mr. Secord, I think we

11 can begin. It looks to me like -- well, with
12 approximate 5 o'clock adjournment, we should be pretty
13 close to the time that you've requested and we've
14 granted. Now, having said that, we probably need at
15 least -- well, for sure at least one break -- I know
16 I'm going to need one to get up and stretch, and maybe
17 two. It's bit of a long go, but let's see if we can
18 get wrapped up this afternoon, and the floor is yours.

19 MR. SECORD: Thank you.

20 M. HEBERT, M. SVENSON, W. SPELLER, D. BRESCIA, M. WOOD, D.

21 SOL, J. MENNINGER, Y. CARIGNAN, M. SMITH, M. PERRET (For

22 Alberta Transportation), previously sworn

23 MR. SECORD CROSS-EXAMINES THE PANEL:

24 Q. My name is Richard Secord, and I am counsel for the
25 SCLG.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 And I thought it might be worth just having a
2 brief discussion about acronyms. I take it if I use
3 the word "AT" for Alberta Transportation; "SCLG,"
4 "SR1," "SORP," "MC1," that's not going to cause any
5 difficulty for AT's Topic block 1 Panel. Is that
6 correct, Mr. Hebert?

7 **A. MR. HEBERT:** **Mr. Secord, I believe it won't,**
8 **but certainly if it's unclear, we'll seek to clarify.**

9 **Q.** Sure. And if I use the term "FOR," you'll understand
10 that to be the flood of record?

11 **A. MR. HEBERT:** **I do now, sir, yes.**

12 **Q.** "PMF," possible maximum flood?

13 **A. MR. HEBERT:** **Yes.**

14 **Q.** And then there's another term that's been kicking
15 around called "design flood." Can you confirm that the
16 design flood is, in fact, the FOR or flood of record?

17 **A. MR. HEBERT:** **Just to be completely certain,**
18 **make sure, Mr. Wood can confirm that.**

19 **THE CHAIR:** **Mr. Wood, we cannot hear you.**

20 **A. MR. WOOD:** **My apologies. Yes, I can confirm**
21 **that the design flood is the flood of record on the**
22 **Elbow River.**

23 **Q.** So under the rubric of project justification, costs and
24 benefits and --

25 **THE CHAIR:** **Mr. Secord, I'm sorry. Everyone**

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 else is coming through crystal-clear on my end. I do
2 understand you, Mr. Secord, but there's like this
3 associated static that's coming with your voice.

4 Is anyone else experiencing that or is that
5 perhaps just on my end? It seems like everybody is
6 hearing it.

7 I do understand you, but there's like a static
8 that's just overriding on your voice a little bit
9 there.

10 MR. SECORD: All right. How does that sound?

11 THE CHAIR: It's about the same. It's about
12 the same, but we can -- I mean, I do understand you.

13 Ms. DiPaolo, can you understand for the purposes
14 of transcribing?

15 THE COURT REPORTER: Sorry, yes, I can. I just didn't
16 know who was speaking at the beginning --

17 MR. SECORD: Okay. I did mention my name.

18 COURT REPORTER: -- in response to Mr. Secord.

19 THE CHAIR: Oh, in response. Mr. Hebert.

20 THE COURT REPORTER: Yes.

21 THE CHAIR: Right. So and perhaps for -- we
22 have changed court reporters for the afternoon, and
23 Ms. Vespa was sort of getting used to everybody's
24 voices, but Ms. DiPaolo will have to do the same.

25 So, if you're interjecting, perhaps just say your

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 name quickly so that Ms. DiPaolo can get it recorded.

2 Thank you.

3 Okay, Richard.

4 MR. SECORD: And if this proves to be a
5 problem, I can phone in on my -- on my cell, which I
6 know gives a really good connection. So let's see how
7 it goes.

8 Q. So under the rubric of project justification, costs and
9 benefits, and alternatives considered, I'd like to
10 start with a review of the two aids to cross that I
11 sent Ms. Friend yesterday.

12 So if the document manager could pull up Aid to
13 Cross Number 2, please.

14 MR. FITCH: Yeah, Mr. Chair. It's Gavin
15 Fitch. I think what the Panel manager has done is,
16 earlier this morning, I forwarded aids to cross for
17 Mr. Secord's first witness panel, and that's our Aid to
18 Cross Number 2. So we're looking at the wrong Aid to
19 Cross Number 2.

20 MR. SECORD: Yeah, this is described as "SCLG
21 Aid to Cross Number 2, SR1 Versus MC1 Limitations."
22 It's right at the bottom, right there.

23 THE CHAIR: Yeah, perfect. I was just going
24 to ask that, Mr. Secord. Thank you.

25 Q. MR. SECORD: All right. So I'd like to run

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 over this document with the AT Panel, and just to set
2 out a few details.

3 First of all, at the top, you have a column for
4 SR1, and it indicates that the storage capacity -- the
5 net storage capacity from the flood is 70,210,000 --
6 sorry -- 70,210,000 cubic metres or 70,210 dam cubed;
7 correct?

8 **A. MR. WOOD:** That is not correct. The active
9 storage capacity of SR1 includes a 10 percent factor
10 safety on that number.

11 **Q.** Okay. And so what do you have, then, as the correct
12 number?

13 **A. MR. WOOD:** It's 77 million --

14 **THE COURT REPORTER:** I'm sorry, who's speaking? I
15 still can't see who's speaking.

16 **A. MR. WOOD:** My apologies. It's Matt Wood --

17 **THE COURT REPORTER:** Thank you.

18 **A. MR. WOOD:** -- with AT.

19 **THE COURT REPORTER:** Thank you.

20 **Q. MR. SECORD:** All right. And then on the other
21 column, we have for MC1, the storage capacity for MC1
22 is 70,100,000 cubic metres or 70,000 -- sorry,
23 70,100,000 cubic metres or 70,100 dam cubed; is that
24 correct?

25 **A. MR. WOOD:** Subject to check and given the

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 source, I would say it's correct.

2 Q. Right. And in relation to the restriction on the
3 reservoir intake, I found this somewhat confusing going
4 through AT's materials. If we turn to SR1, the EIA
5 from 2018, Exhibit 18, the restriction on the reservoir
6 intake at that time was 600 cubic metres per second; is
7 that correct?

8 A. MR. WOOD: That is correct.

9 Q. And then if we turn to the SR1 design report of
10 December 20, 2020, Exhibit 159, PDF page 83, there is a
11 number listed at 480 cubic metres per second; is that
12 correct?

13 A. MR. WOOD: Both those numbers are correct. I
14 think some context is warranted.

15 But the maximum diversion capacity -- the maximum
16 capacity of SR1 is 600 cubic metres --

17 THE CHAIR: Hold it. Excuse me, excuse me.
18 We've got -- we've got two people -- (external noise
19 interruption)

20 THE CHAIR: We've got two people speaking at
21 one time there, sorry about that, on my end.

22 A. MR. HEBERT: Mr. Secord, you've suddenly gone
23 very hard -- it's very difficult to hear you, and
24 Mr. Wood had been actually answering your question, and
25 you seemed to have started your next question before

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 he'd finished. I'm not sure if that's just an audio
2 difficulty or what.

3 THE CHAIR: Something seemed to get crossed.
4 Let's try that again. Can we just go over that
5 question and start over again, especially for the court
6 reporter, please, and for the benefit of the Panel.
7 Thank you.

8 Q. MR. SECORD: All right. So, Mr. Wood, you said
9 that there was some context that needed to be
10 discussed. So my question for you is if you could
11 provide that context.

12 A. MR. WOOD: Yes, absolutely, Mr. Chairman.
13 Both those numbers are correct, but within different
14 context.

15 The 600 cubic metres per second is the maximum
16 diversion capacity of SR1. You will see reference to
17 480 cubic metres per second within the material. That
18 is the diversion rate that was necessary -- that would
19 have been necessary to achieve the 2013 design flood
20 basin.

21 So the effects, desired effects, could be achieved
22 by diverting 480 cubic metres per second, and as has
23 been referenced in some of the SIRs and some of our
24 responses, a 25 percent factor of safety was added to
25 that 480, and that's where you get that 600.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 So the diversion, the maximum diversion capacity,
2 a diversion rate capacity of SR1 is 600 cubic metres
3 per second.

4 Q. Right. Then when we go to restriction -- restriction
5 on the reservoir outflow, for SR1, the restriction on
6 the load level outlet is 27 cubic metres per second; is
7 that correct?

8 A. MR. WOOD: That is correct.

9 Q. And with -- within MC1, the reservoir outflow could be
10 as much as 2,600 cubic metres per second?

11 A. MR. WOOD: Subject to check on the MC1, I
12 would say that's correct, yes.

13 Q. Right. And just to compare MC1 to SR1 in terms of
14 restriction on the reservoir intake, MC1 could --
15 could, in fact, take the PMF, or probable maximum
16 flood; correct?

17 A. MR. WOOD: Well, I would replace that with
18 there is no restriction. It is an in-line dam, and it
19 is subject to whatever's coming out it.

20 Q. Okay. So then if we scroll down, document manager, to
21 the -- to the heading "MC1 Report, Conceptual Design
22 Report," page 46, under the heading, "6.1.5 Summary,"
23 it states: (as read)

24 "In summary, a routing model has been
25 developed and used to evaluate the

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 hydraulic performance of the proposed
2 flood mitigation scheme. The results of
3 these runs are summarized in Table 6.1
4 below."

5 So they've listed here basically five flood types: The
6 20-year flood, the 100-year, the June 2013 flood, which
7 is the design flood or flood of record, and then we have
8 the 1,000-year flood, and something called the PMF, the
9 probable maximum flood; correct?

10 **A. MR. WOOD: Correct. Those are the headers in**
11 **the table.**

12 **Q.** Right. And so in terms of the probable maximum flood
13 of 2,770 cubic metres per second, MC1 would be able to
14 completely absorb that PMF as you've stated; correct,
15 Mr. Wood?

16 **A. MR. WOOD: I'm not too sure,**
17 **Mr. Speaker [verbatim], what is meant by "absorb." In**
18 **that case, MC1 would fill to its capacity and begin to**
19 **spill the excess waters.**

20 **Q.** Right. However, if we look at SR1 and we have a -- a
21 probable maximum flood coming at it, the best that SR1
22 could do would be to take 600 cubic metres per second
23 from the peak, which would then pass 2,170 cubic metres
24 past the structure. Do I have that right?

25 **A. MR. WOOD: That is correct, but if I may, I**

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 would also point out that MC1 in the fifth column there
2 would be passing around, I believe, 2,600 as well.

3 Q. Where do you see the 2,600?

4 A. MR. WOOD: I'm just doing some quick math
5 here, looking at the tunnel outlet peak discharge rate,
6 the service spillway peak discharge and the auxiliary
7 earth channel peak discharge.

8 Remember, when the PMF is coming, it is not that
9 the reservoir is able to store all this and hold it for
10 later. When it arrives, it holds back what it can, and
11 the rest of it spills over at spillways, and that's
12 what you're seeing in that column there.

13 Q. That's the restriction on the outflow, right? MC1, you
14 just said, could take the probable maximum flood. It
15 could take the peak, depending upon what the reservoir
16 size capacity was. It doesn't mean to say that it's
17 going to take a PMF and then pass the entire PMF
18 through the reservoir outflow?

19 A. MR. WOOD: Mr. Chairman, could he please
20 clarify what he means by "take the flood."

21 Q. Well, I'm just using your word, Mr. Wood. You said
22 that McLean Creek could take anything that comes at it,
23 and we know that SR1 cannot. Do you understand the --
24 the -- well, let's take a look at the chart below,
25 Table 6.1. Did you look at the tunnel outlet structure

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 peak discharge rate?

2 A. MR. WOOD: I'm looking at that right now,
3 Mr. Chairman.

4 Q. Right. So you told the Board that the MC1 would be
5 discharging 2,600 cubic metres per second as a result
6 of the PMF.

7 As I read this table, what would happen is that
8 the tunnel outlet structure peak discharge rate would
9 be 1,000 cubic metres per second; not, as you've said,
10 2,600 -- 2,600 cubic metres per second?

11 A. MR. WOOD: I was simply adding the thousand
12 for the tunnel outlet structure, the 600 for the
13 service spillway peak discharge, and the thousand for
14 the auxiliary peak discharge.

15 Now, we have to also consider that this, just as
16 is pointed above, it's a flood routing exercise, can't
17 necessarily just add those up, but I believe that
18 this -- Mr. Secord is mischaracterizing the ability of
19 MC1 to be able to -- to take the PMF.

20 Q. Well, let's just take a look at the 1 in a 1000-year
21 flood, Mr. Wood. The peak reservoir inflow here is
22 shown as 1,984 cubic metres per second; correct?

23 A. MR. WOOD: That is correct.

24 Q. And you've indicated that MC1 can take whatever is
25 coming at it. And as I look at this, the tunnel outlet

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 structure peak discharge rate would be 830 cubic metres
2 per second; correct?

3 **A. MR. WOOD:** I said MC1 would have to take
4 everything that's coming at it. But, yes, you are
5 correct, that is 830 cubic metres per second.

6 **Q.** Let's take a look at the performance of SR1 in relation
7 to a 1,000-year flood of 1984 cubic metres per second.
8 The best that SR1 could do would be to take 600 cubic
9 metres per second, which would mean that it would pass
10 1,384 cubic metres per second past the structure;
11 correct?

12 **A. MR. WOOD:** That is correct.

13 **Q.** And, in fact, if you were only operating using the
14 480 cubic metres per second, that would pass something
15 in excess of 1,500 cubic metres per second past the
16 structure?

17 **A. MR. WOOD:** The diversion structure capacity
18 is 600.

19 **Q.** No, but I'm just saying if you were operating it to
20 only take 480 cubic metres per second, I take it you
21 could operate it to see that result, correct, depending
22 upon how you operate the gates?

23 **A. MR. WOOD:** It could be operated that way.
24 I'm not too sure why Alberta Environment Parks would
25 operate it that way if a large flood was coming out.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 Q. And so if -- if a 1 and 1,000-year flood came down the
2 Elbow, there would be an even greater -- the SR1
3 structure would send to Calgary an even greater flood
4 than the flood of record of 2013. Do I have that
5 right?

6 A. MR. WOOD: The peak flow would be larger.
7 Just as you pointed out, it would be roughly 1384, but
8 you have to remember that, without SR1, that would be
9 1984 arriving at the City of Calgary.

10 Q. Right. And with -- with McLean Creek and without SR1,
11 the flood would be less than a 1 in 100-year flood?

12 A. MR. WOOD: It would be approximately a 1 in
13 100-year flood based on this situation here --

14 Q. Well, not approximately. It would be less than a 1 in
15 100-year flood.

16 A. MR. WOOD: Mr. Chairman, I think it depends
17 which reference you're referring to. These frequency
18 estimates are specific to that report from which they
19 were sourced.

20 Q. If we could turn up SCLG Aid to Cross Number 1. So
21 this document is entitled "Aid to Cross Number 1
22 Comparison Between MC1 and SR1 at Various Flow Rates."

23 So scenario Number 1 deals with rates for MC1 and
24 MC1 conceptual design report, Exhibit 101. And so we
25 have the 1 in 100-year flood at 930 cubic metres per

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 second.

2 With SR1, you have -- upstream of SR1, you have
3 flooding, and basically of the 930 cubic metres per
4 second, are you taking 600 cubic metres per second of
5 the peak flow and passing on 330 metres -- cubic metres
6 per second downstream? Or do you subtract the 480?

7 **A. MR. WOOD:** I think it would be appropriate to
8 subtract the 600 here. I believe, if you're referring
9 to the 330 highlighted in red, that would be accurate.

10 **Q.** Okay. And so I take it, then, between SR1 and the
11 Glenmore Reservoir, based on a 1 in 100-year flood,
12 there would be flooding; correct?

13 **A. MR. WOOD:** Mr. Chair, could you please
14 rephrase the question?

15 **Q.** So, basically, you've taken 600 cubic metres per second
16 of the 930 cubic metres per second peak. The structure
17 then would be passing 330 cubic metres per second
18 downstream.

19 We know that there would obviously be flooding
20 upstream of SR1 because this is a 1 in 100-year flood.
21 I take it there would also be flooding between SR1 and
22 the Glenmore Reservoir, flooding of the Springbank
23 communities, and some of the river communities on the
24 Elbow River upstream of the Glenmore Reservoir?

25 **A. MR. WOOD:** Mr. Chairman, that's not

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 necessarily the case. It would depend where various
2 properties are located near the river. You know,
3 330 cubic metres per second does not necessarily mean
4 widespread flooding.

5 We do have some information submitted as evidence,
6 particularly the hazard mapping, which could be used to
7 draw inferences as to what that kind of flow rate would
8 look like.

9 Q. And the -- the MC1 comparison, though, indicates that
10 there would only be -- there would only be a discharge
11 of 212 cubic metres per second; correct?

12 A. MR. WOOD: Mr. Chair, that would be correct
13 at MC1.

14 I must remind the Board that the area between MC1
15 and -- and Glenmore has a large drainage area and
16 additional rainfall like that which occurred in, say,
17 2005 flood event falling on that area could raise those
18 flows.

19 Q. Yeah. But in any event, the MC1 scenario for 1 in
20 100-year flood, its performance is superior for the --
21 both upstream of SR1 and downstream of SR1, and
22 considerably superior upstream considering you're
23 comparing 930 cubic metres per second to 212 cubic
24 metres per second. But you agree with that?

25 A. MR. WOOD: I -- I would say, Mr. Chair, that

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 the numbers reflected here are indicative of the
2 discharges of the facility, given the simulated
3 inflows.

4 Q. So let's look at scenario Number 2, the design flood or
5 flood of record or FOR. The scenario is at 1,240 cubic
6 metres per second flood. Upstream of SR1, you would
7 have significant flooding at communities such as
8 Bragg Creek and Redwood Meadows; correct? SR1 does
9 nothing for those communities; correct?

10 A. **MR. WOOD:** **SR1 is located downstream of those**
11 **communities, and so it, in itself, does not provide**
12 **flood mitigation to them.**

13 Q. No. And if we compare it to McLean Creek, those
14 communities upstream of SR1, instead of receiving a
15 design flood or flood of record would, in fact, receive
16 a peak flow of 212 cubic metres per second, which I
17 believe it would be something like, what, a 1 in
18 ten-year flood? Something of that nature?

19 A. **MR. WOOD:** **Yes, I believe that's accurate**
20 **that the facility would be discharging that. Pending**
21 **local inflow around the area and from the tributaries**
22 **in the area, that would probably be accurate.**

23 Q. Yeah, so putting it another way, SR1 delivers to
24 Bragg Creek and Redwood Meadows a 1 in 200 flood event,
25 MC1 would result in a 1 in ten-year flood event for

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 those same communities. That would be another way of
2 looking at it, Mr. Wood?

3 A. MR. WOOD: I think, you know, generally yes,
4 it's probably about a ten-year flood, and with that, I
5 would say that is generally the case, SR1 does not
6 provide mitigation to those communities.

7 A. MR. HEBERT: So, Mr. Chairman, I'd remind --
8 sorry, just to amend Mr. Woods' answer -- it's Matthew
9 Hebert, my apologies -- that there are flood mitigation
10 projects in the communities in question; there's a
11 project under development at Bragg Creek, there's flood
12 mitigation that's at Redwood Meadows.

13 Q. Which wouldn't be needed if MC1 had been selected.
14 Correct, Mr. Hebert?

15 A. MR. HEBERT: Mr. Chairman, that might be a fair
16 statement, although had the government pursued MC1,
17 there's a high probability a much deeper level of
18 analysis would have been required to have made that --
19 to have confirmed that definitively.

20 Q. Now, if we look at the design flood scenario 2, between
21 SR1 and the Glenmore Reservoir, basically, what -- the
22 best that SR1 can do is take the 1,240 cubic metres per
23 second peak and reduce it by 600 cubic metres per
24 second, which would then send 640 cubic metres per
25 second -- sorry, 640 cubic metres per second downstream

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 towards those people who live on the Elbow River
2 between SR1 and the Glenmore Reservoir.

3 And so that would essentially be something, I
4 would say, in the order of a 1 in 75-year flood that
5 SR1 would be sending down to the residents of
6 Springbank and the City of Calgary. Do I have that
7 right?

8 **A. MR. WOOD:** Mr. Chair, in the design flood
9 event, with 1240 coming into the diversion structure
10 and SR1 diverting 600 cubic metres per second from that
11 1240, the resultant would be 640 cubic metres passing
12 downstream of the diversion structure.

13 **Q.** Which is basically sending a 1 in 75-year flood into
14 the City of Calgary. Do I have that right?

15 **A. MR. WOOD:** It's -- it's reducing a 200-year
16 flood down to about a 1 in 75-year flood, yes.

17 **Q.** Right. And has Alberta Transportation actually told
18 Flood Free Calgary that in the event of a flooded
19 record or design flood, that, in fact, Calgary won't be
20 flood-free. Have you had that communication with
21 Flood Free Calgary?

22 **A. MR. WOOD:** Mr. Chairman, if I may.

23 **A. MR. HEBERT:** Sorry, Mr. Chairman. We've not
24 had that specific communication, although --

25 **THE CHAIR:** Excuse me, could you identify

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 yourself?

2 A. MR. HEBERT: Our apologies, Mr. Chair. It's
3 Matt Hebert responding. I'll start again.

4 We've not had that specific communication with
5 Flood Free Calgary, and I would note that the
6 requirements for flood mitigation if required in that
7 stretch of Calgary would be the responsibility of the
8 local authority in that case. In that case, the
9 City of Calgary.

10 Q. MR. SECORD: When the politicians selected SR1
11 as the choice for flood mitigation, did
12 Alberta Transportation advise the politicians that SR1
13 would turn a design flood, a 1 in 200-year flood, into
14 a 1 and 75-year flood, which would still end up
15 flooding residents and businesses along the Elbow River
16 upstream of the Glenmore Reservoir.

17 A. MR. HEBERT: One moment, Mr. Chair. Mr. Wood
18 will respond.

19 A. MR. WOOD: Mr. Chairman, I would just like to
20 correct the characterization of the performance of SR1.

21 Remember that the SR1 is a system. It does
22 include an active flood storage allocation at Glenmore
23 of 10,000 dam cubes, and that -- that storage, as part
24 of the system which was also allocated to the MC1
25 option which was discussed earlier, that 10,000 dam

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 cubes can reduce the flows downstream of Glenmore to
2 170 cubic metres per second. And so --

3 Q. Mr. Wood -- Mr. Wood, we're not talking about -- I
4 haven't got downstream of Glenmore yet. We're not
5 talking about downstream on the Glenmore Reservoir.

6 My question was did you tell the politicians that,
7 as a result of choosing SR1, the design flood or flood
8 of record would be reduced from a 1 in 200-year flood
9 to a 1 in 75-year flood and that that flood would be
10 sent down to the Elbow River through Springbank
11 community and through the Calgary residences along the
12 Elbow upstream of the Glenmore Reservoir?

13 A. MR. HEBERT: Mr. Chairman, I'm not aware of the
14 precise answer, although I would refer back to a
15 response I provided a moment ago that local flood
16 mitigation is a responsibility of particularly the
17 municipality involved. The province, as appropriate,
18 works with those municipalities to ensure that flood
19 mitigation is in place where needed. I'm not aware of
20 the exact advice provided at the time, but certainly
21 the City of Calgary, in the case you're referencing,
22 would have to provide input as to the appropriateness
23 of flood mitigation in that circumstance.

24 Q. Well, let's take a look at scenario 3 to this aid of
25 cross. So we have scenario 3, the 1 in 1,000-year

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 flood, 1,984 cubic metres per second at its peak. We
2 have upstream of SR1, we have the -- we have the
3 communities at Bragg Creek and Redwood Meadows
4 absolutely devastated.

5 I take it, Mr. Wood, you would have seen the
6 inundation maps showing these communities under water
7 as a result of a 1 in 1,000-year flood? You've looked
8 at those inundation maps?

9 **A. MR. WOOD:** Yes, I have looked at those
10 inundation maps. I'm not familiar with them in detail,
11 but I am familiar with what is being referred to.

12 **Q.** And you would agree that they would be absolutely
13 devastated by a 1 in 1,000-year flood and would be
14 under water?

15 **A. MR. WOOD:** Yes, I can agree with that.

16 **Q.** And SR1 does nothing for them, but McLean Creek would
17 essentially subject those communities to an 830 cubic
18 metres per second flood, which would be basically
19 something like a 1 in 75-year flood or something like
20 that. Would you agree with that?

21 **A. MR. WOOD:** Oh, I don't know if I'd consider
22 with the frequency that is being suggested, but I will
23 note that the community would still experience 830
24 cubic metres per second in that event.

25 **Q.** That would be something like a 1 in 75-year flood?

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 **A. MR. WOOD:** 1 in 75 or 1 in 100, depending on
2 which flood frequency estimates are being used, yes.

3 **Q.** Sure. And then between SR1 and the Glenmore Reservoir,
4 you have the reservoir passing a flood of 1,384 cubic
5 metres per second and sending it towards the
6 City of Calgary; is that correct?

7 **A. MR. WOOD:** In that event, SR1 would be able
8 to remove 600 cubic metres per second from the peak.

9 **Q.** Yeah, and can you tell me, in -- in
10 Alberta Transportation's discussions with CRCAG or Free
11 Flood Calgary, did you advise CRCAG or Free Flood
12 Calgary that in the event of a 1 in 1,000-year flood,
13 that SR1, in fact, would send towards the
14 City of Calgary and its residents a flood even greater
15 than the design flood that SR1 is being built for? Did
16 you have those discussions with any of those entities?

17 **A. MR. HEBERT:** Mr. Chairman, I'm not aware,
18 although I think we would all recognize that would be a
19 very significant flood event, the problem of which
20 would be quite low, but I think Alberta Transportation
21 would acknowledge that it would be a very, very
22 significant flood event?

23 **THE CHAIR:** Ms. DiPaolo, that was Mr. Hebert
24 speaking.

25 **Q. MR. SECORD:** All right. Well, now, I would

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 like to pick up on one of Mr. Rae's questions. And if
2 we could turn up Exhibit 258, I believe. No, that's
3 not it. Yeah, this is the one where we were looking at
4 the City of Calgary's document Appendix S, and I
5 thought I'd written it down.

6 THE CHAIR: Is it Exhibit 258 you're looking
7 for, Mr. Secord?

8 MR. SECORD: And I thought I had it. Just one
9 second here. Yeah, it's Exhibit 234. Just one second.
10 Yeah, Exhibit 234 I believe is what Mr. Rae was
11 referring to.

12 THE CHAIR: Do you have a PDF page for that,
13 Mr. Secord?

14 MR. SECORD: I do. I do. Yes, I do. And it's
15 PDF page 4.

16 THE CHAIR: Thank you.

17 Q. MR. SECORD: So Mr. Rea was referring you to
18 the second-last bullet on PDF page 4, which states:
19 (as read)

20 "Based on the updated flooding
21 inundation maps, the main residential
22 and/or commercial development areas that
23 would be affected during a 100-year
24 flooding include: Bowness, Shouldice, an
25 area north of Montgomery Boulevard,

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 Kensington, Sunnyside, Prince Edward
2 Island, parts of downtown Calgary, East
3 Village, Bridgeland (where my sister
4 lives), Calgary Zoo, Inglewood, and
5 various areas in south Calgary along the
6 Bow River."

7 So in relation to the design flood in this case, the
8 1 in 200-year flood, at the moment, none of these
9 communities are protected by this project SR1; correct?

10 **A. MR. HEBERT:** So, Mr. Chairman, if you're
11 referring to communities along the Bow River, those
12 would not be protected by SR1.

13 There are other flood mitigation reservoir --
14 sorry -- there are a number of reservoirs along the
15 Bow River that provide flood mitigation to date, and as
16 referred to this morning, the Department of Environment
17 and Parks is pursuing the selection of an additional
18 reservoir project for that route.

19 **Q. MR. SECORD:** So my question is, you've got a
20 design flood coming down the Bow River, a 1 in 200-year
21 flood, let's say you've got SR1 built, and it's taking
22 the 600 cubic metres per second off of the 1,284 cubic
23 metres per second peak, I'm assuming the Bow River then
24 is raging at the confluence of the Elbow and the Bow,
25 which is when I look at the map is somewhere around

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 7th Avenue and 7th Street SE in Calgary.

2 Can you tell me, has anybody looked at whether or
3 not the unconstrained Bow River would cause the
4 Elbow River downstream of the Glenmore Reservoir to
5 back up and to flood Riverdale, Elbow Park, Rideau
6 Park, Roxboro, Erlton area, Victoria, and Stampede
7 along the Elbow River?

8 A. MR. HEBERT: So, Mr. Chairman, I'll begin and
9 I'll allow Mr. Wood to answer the specific question
10 about the analysis.

11 But if it's a benefit to the Panel, in 2013, the
12 combination of different reservoirs on the Bow River
13 reduced the amount of flow that entered Calgary -- it
14 was still significant flood event for that river.

15 I would also note for the Panel that, after the
16 flood in 2013, as it pertained to the Bow River, an
17 agreement was reached with TransAlta and we'll get into
18 flood control, and I would also note that
19 Alberta Environment and Parks later began the process
20 of screening and pursuing the identification of an
21 additional reservoir project.

22 I'd ask Mr. Wood to answer the question about the
23 impact of flow in the City of Calgary.

24 THE CHAIR: Mr. Wood?

25 A. MR. WOOD: Yes, if it's possible,

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 **Mr. Chairman, could I ask to have that part of the**
2 **question repeated.**

3 **Q. MR. SECORD:** **Sure. So the question is pretty**
4 **basic. You got a design flood coming down the**
5 **Bow River, and -- which is what happened in 2013 -- or**
6 **a 1 in 200-year flood, if that's what it was; you have**
7 **SR1 built so that there's basically a 640 cubic metres**
8 **per second flood coming down the Elbow River, which**
9 **then goes into the Glenmore Reservoir.**

10 **But my question was, could -- would the amount of**
11 **water that is flowing through the Bow cause the**
12 **Elbow River to back up and flood Riverdale, Elbow Park,**
13 **Rideau Park, Roxboro, Mission district, Erlton area,**
14 **Victoria, and Stampede along the Elbow River?**

15 **A. MR. WOOD:** **Mr. Chair, I haven't done the**
16 **analysis on that, so I can't speak specifically to**
17 **that; but I should provide some clarification that, in**
18 **2013, the Bow River was not flowing at a 200-year**
19 **event. Estimates have put it somewhere around a 60- to**
20 **a 70-year flood event.**

21 **And in this scenario, in 2013 specifically, if SR1**
22 **had have been on the landscape, it would have been**
23 **reducing the flows downstream of Glenmore to 170, which**
24 **is, you know, below the threshold at which overland**
25 **flood damages start to accrue.**

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 Q. So then, basically, what you're saying, Mr. Wood, is,
2 in the event of a 1 in 200-year flood event on the
3 Bow River, Alberta Transportation doesn't know what
4 impact that would have on the communities downstream of
5 the Glenmore Reservoir between -- between
6 Glenmore Reservoir and the confluence of the Elbow and
7 the Bow?

8 A. MR. WOOD: We don't have that information,
9 Mr. Chair, but remind that the SR1 project mitigates
10 damage from the Elbow River. The province is looking
11 at other mitigations on the Bow River.

12 A. MR. HEBERT: Mr. Chairman, this wouldn't
13 constitute a technical answer, but I think it bears
14 reference to the Panel that, if SR1 were functioning in
15 the scenario that's been described, it would still be
16 reducing flows of the volumes of water entering the
17 City of Calgary.

18 Again, it's not possible to speculate on the
19 nature of flooding that would occur on any river in a
20 given event, but if the 2013 scenario were to repeat
21 itself, and SR1 is functioning, that volume of water is
22 removed from the City of Calgary at the confluence.

23 Q. Does Alberta Transportation agree that water is a
24 limited resource and that Calgary's water supply is
25 changing due to climate change and a growing

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 population?

2 **A. MR. HEBERT:** Well, Mr. Chairman, I think
3 Alberta Transportation would generally agree that water
4 is a critical resource to the province's economic and
5 social development. In the context of Calgary
6 specifically, as we referenced this morning, we noted
7 the City of Calgary's objectives as it related to water
8 management and water storage.

9 **Q.** Document manager, we may want to turn this up, but it's
10 Exhibit 37, and I'm just going to read a couple of
11 propositions from this document, and just let me know
12 whether you agree.

13 Does Alberta Transportation agree that the
14 Elbow River is a source for approximately 40 percent of
15 Calgary's water supply?

16 **A. MR. HEBERT:** Subject to check, I believe that's
17 correct. I see it now on the screen, and I will take
18 City of Calgary's word for it.

19 **Q.** And does Alberta Transportation agree that the
20 Glenbow -- sorry, that the Elbow Valley watershed
21 covers an area of 1,227 square kilometres and drains
22 into the Glenmore Reservoir?

23 **A. MR. HEBERT:** That is correct, and it's
24 reflected on the screen on the exhibit.

25 **Q.** And I understand that the Elbow River is 120 kilometres

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 long and passes through four subclimates before it
2 enters the Glenmore Reservoir. Do you agree with that?

3 **A. MR. HEBERT: Yes, that is the statement on the**
4 **exhibit.**

5 **Q. Right. And the Elbow River is the source of water for**
6 **the Glenmore water treatment plant?**

7 **A. MR. HEBERT: That is correct.**

8 **Q. And does Alberta Transportation agree that the**
9 **Bow River watershed covers an area of 7,770 square**
10 **kilometres?**

11 **A. MR. HEBERT: Yes, that's in the exhibit.**

12 **Q. And the Bow River supplies the Bearspaw Water Treatment**
13 **Plant, and it is the source for nearly 60 percent of**
14 **Calgary's water supply?**

15 **A. MR. HEBERT: That is in the exhibit, and it is**
16 **correct.**

17 **Q. And in relation to SR1, SR1 will not store any water on**
18 **the Elbow River which might be used by the Glenmore**
19 **Water Treatment Plant in the future in the event of a**
20 **severe drought?**

21 **A. MR. HEBERT: Mr. Chairman, the SR1 project is**
22 **designed to be a flood mitigation project, and we've**
23 **not submitted an application to use the project for**
24 **water management or water storage.**

25 **Q. All right. I'd now like to turn to the Deltares report**

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 which is Exhibit 13, PDF page 8, and I'll also be
2 referring to the Opus -- MC1 Opus report, Exhibit 101,
3 PDF page 46.

4 In terms of flood volumes -- and let me just pull
5 that up for a second.

6 THE CHAIR: That is correct, Mr. Secord?

7 MR. SECORD: Yes, it is.

8 Q. So this is on PDF page 1 under the second paragraph
9 under "Issue," it says: (as read)

10 "We conclude that, based on the current
11 design concepts, most storage sites can
12 provide the required storage for the
13 1 in 200 event used as design flood."

14 And: (as read)

15 "We think that MC1 and SR1 could achieve
16 a similar reduction in flood risk once
17 built."

18 Can you tell me, what is the justification for this
19 conclusion of "similar reduction in flood risk"?

20 A. MR. HEBERT: One moment, Mr. Chairman.

21 Sorry, Mr. Chairman, just had to take a moment to
22 confer with the panel.

23 But that statement is based on the notion that
24 both projects were able to store the volumes required
25 to reduce the flows at the -- below the

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 **Glenmore Reservoir.**

2 **Q. What quantitative work was performed to determine this**
3 **conclusion?**

4 **A. MR. HEBERT: One moment.**

5 **Mr. Chairman, it's fair to say that it was a**
6 **function of the volumes that were to be maintained**
7 **below Glenmore Reservoir.**

8 **Q. What is the justification for using flood volumes as**
9 **the basis of comparison of outcomes, rather than the**
10 **performance of either project, at various flood rates**
11 **or hydrographs?**

12 **A. MR. HEBERT: So, Mr. Chairman, if I remind the**
13 **Panel, in my introduction or our submissions, the**
14 **objective is to have a project that is capable of**
15 **storing flood volumes to reduce flows coming from the**
16 **Glenmore Reservoir to below 170 metres -- metres cubed**
17 **per second, and with that objective, that justified the**
18 **choice and selection of the project on the Elbow River.**

19 **Q. Was an analysis of rates used or was it just volumes?**

20 **A. MR. WOOD: Mr. Chairman, I believe what**
21 **Mr. Hebert is referring to is the design basis of the**
22 **two projects was the same. It was both to -- both**
23 **projects used 10,000M cubes of active storage available**
24 **at Glenmore, and both aim to reduce flows downstream of**
25 **Glenmore to 170.**

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 So, in that sense, they are on par in achieving
2 that design basis, and as you can see in the Deltares
3 report, last sentence in that paragraph that was being
4 quoted, that it also includes flood protection measures
5 specifically for Bragg Creek and, in turn, Redwood
6 Meadows later on through the process, and so that is
7 why they claim the difference to be small.

8 Q. Do you agree that it is clear that SR1 allows much
9 flood volume to bypass the diversion?

10 So, for instance, for SR1 to get to 70 million
11 dam cubed, do you agree that over 120,000 dam cubed has
12 to reach the intake -- sorry, over 120 million
13 dam cubed has to reach the intake?

14 Let me just run that by you again just to be -- so
15 just let me -- I'll just run this by you again.

16 Do you agree with this proposition: SR1 allows
17 much flood volume to bypass the diversion, for SR1 to
18 get to 70 million dam cubed over 120 million dam cubed
19 has to reach the intake. Do you agree with that
20 proposition?

21 A. MR. WOOD: Mr. Chairman, I don't know if I
22 would necessarily agree with that. I mean, every event
23 comes in differently. I think what's important is the
24 diversion rate here, and I think, as well, as we're
25 talking about volumes and rates and interchanging them,

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 it is -- it is the peak, you know, that is most
2 important when it comes to flood damages, not
3 necessarily the volume.

4 Q. Sorry, but in terms of -- well, comparing it to MC1,
5 MC1 can capture a hundred percent of the 70 million
6 dam cubed before it reaches downstream. In other
7 words, it collects the 70 million dam cube of water.
8 SR1 has to have 120 million dam cube go by the
9 diversion structure before it gets to its 70 million
10 dam cube capacity; correct?

11 A. MR. HEBERT: Mr. Chairman, we'll just take a
12 moment. Mr. Chairman, we'll just caucus for a moment,
13 thank you.

14 THE CHAIR: Just while we're waiting,
15 Mr. Secord, I think document manager's maybe wondering
16 which exhibit, if any, it is important for you to have
17 up on the screen right now?

18 MR. SECORD: I think we can put that one down
19 and we can go to Exhibit 265, PDF page 5.

20 THE CHAIR: So, Ms. Decosemo, at 265, page...

21 MR. SECORD: 5.

22 THE CHAIR: 5.

23 I think we're going to the net for this. It looks
24 like there may be a bit of a hiccup.

25 MR. SECORD: Yeah, I don't know if we need to

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 turn it up.

2 A. MR. HEBERT: Mr. Chairman, we've returned from
3 our breakout room. I hope it's worked technically on
4 your end. It seems to have worked technically on ours.

5 THE CHAIR: Yes. Proceed, thank you.

6 A. MR. HEBERT: Thank you, Mr. Chairman. I'd
7 invite John Menninger to supplement our response.

8 A. MR. MENNINGER: Sure. So I believe the question
9 from Mr. Secord was with regards to allowing flood
10 flows to pass through SR1 versus MC1, and they in fact
11 operate very similarly.

12 MC1 passes through, during a flood event,
13 212 cubic metres per second, consistently along the
14 entire hydrograph of the 2013 flood event.

15 So, during that period of time, it's allowing that
16 excess, if you will, of 130,000 dams cubed to pass
17 through the LLOW that works in a consistent piece, but
18 the same volume.

19 SR1 operates just a little bit differently because
20 that, as was mentioned, the diversion can be up to
21 600 cubic metres per second into the channel, we're
22 allowing 160 to pass through typically. When it
23 exceeds 760 cubic metres per second, then a little bit
24 more than at that higher peak passes downstream, but
25 then we throttle it back down allowing only 160

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 downstream again for that extended period.

2 One of the unique things about the 2013 event, the
3 peak was significant, but also was the length of the
4 kind of the second plateau of the hydrograph, and we --
5 basically, SR1 captures 75 to 80 percent of that second
6 hump, if you will, for a two-day period of time.

7 So as I said, they both pass -- they both have the
8 exact same storage volumes of 70,000 dams cubed, and so
9 they -- in effect, they both have to pass the exact
10 same volumes downstream.

11 They do it slightly differently, but they do
12 pass -- they do in fact pass the same amount of volume.

13 A. MR. HEBERT: Mr. Chairman, if I could just
14 supplement the response.

15 The feature on SR1 that was one of the advantages
16 of selecting the project is the capture of the large --
17 from both the water from the larger area, catchment
18 area, relative to the McLean Creek option.

19 Q. And how far is -- how far is SR1 from Redwood Meadows?

20 A. MR. HEBERT: Mr. Chairman, I'd prefer not to
21 give you approximate -- sorry, prefer to give you an
22 approximate answer, so just bear with me one moment.

23 Mr. Chairman, it's 2.6 kilometres from the
24 project.

25 Q. How far is -- how far is Bragg Creek from SR1?

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 **A. MR. HEBERT:** I'd prefer not to approximate,
2 so -- yeah, Dave Brescia can answer. What was that,
3 sorry?

4 **Approximately 9.5.**

5 **Q.** And how far is Bragg Creek from McLean Creek? Or the
6 McLean Creek campground or MC1 location?

7 **A. MR. HEBERT:** Bear with us one moment.

8 **Mr. Chairman, I'd prefer to get a precise answer,**
9 **so perhaps we can provide a precise answer at the**
10 **break.**

11 **Q.** Okay. What causes flooding? Volumes or rates?

12 **A. MR. HEBERT:** I'd invite Mr. Wood or
13 **Mr. Menninger to supplement -- or directly respond to**
14 **that question.**

15 **A. MR. MENNINGER:** So the context for flooding means
16 **the capacity of a channel for a given flow rate will**
17 **dictate the area, generally speak, although volume**
18 **plays a significant role.**

19 **If you are capacity constrained, volume can --**
20 **storage in an area can delay that peak from occurring**
21 **or slowing down. So I guess the answer is kind of**
22 **both.**

23 **Q.** Is it fair to say that a large volume of water can pass
24 by Calgary at lower flow rates without flooding
25 Calgary?

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 **A. MR. MENNINGER:** **Yes. In fact, that's the strategy**
2 **employed by both projects.**

3 **Q.** And have you taken -- have you looked at AEP's
4 inundation maps that were filed as part of the SCLG
5 submissions in February of 2020? For instance,
6 Appendix M?

7 **A. MR. MENNINGER:** **That wasn't -- but I can open it**
8 **up for the Panel.**

9 **Q.** Sure. Would you agree that AEP summarizes rates with
10 associated return periods and confidence intervals, and
11 that AEP uses these rates to create -- or used these
12 rates to create a series of flood inundation maps?

13 **A. MR. MENNINGER:** **Yes.**

14 **Q.** And do you agree that AEP does not use volumes to
15 create flood inundation maps?

16 **A. MR. MENNINGER:** **Correct. It's based off the**
17 **exact -- but I will say that volume plays a role in the**
18 **hydrographs that then form the basis for the peak. And**
19 **so when we were talking about flooding occurring in the**
20 **case -- in that case, the peak flood -- what you are**
21 **seeing in those flood maps would be representation of**
22 **the peak flow at a given location. So that is true.**

23 **Q.** So would you say the river outflow rates in comparing
24 SR1 to MC1 would be important?

25 **A. MR. MENNINGER:** **It would depend on the context,**

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 **but could be important.**

2 Q. Was this analysis ever performed before SR1 was
3 selected? And, if so, where are the results?

4 A. **MR. HEBERT:** **Mr. Chairman, one moment.**

5 **Mr. Chairman, could Mr. Secord repeat his**
6 **question?**

7 Q. I was discussing with Mr. Menninger that the river
8 outflow rates, in comparing SR1 to MC1, were important,
9 and I asked him, was this analysis ever performed
10 before SR1 was selected, and, if so, where are the
11 results?

12 A. **MR. HEBERT:** **Mr. Chairman, we'll take a moment**
13 **to caucus.**

14 A. **MR. SPELLER:** **Mr. Chairman, it's Wayne Speller.**

15 **So we're still not quite sure if we understand the**
16 **question, but the flood mapping that was conducted from**
17 **Glenmore through the city for inundation modelling was**
18 **considered as part of the benefit cost analysis that**
19 **was done, and the benefit cost analysis was a**
20 **consideration; when you look at that, the Alberta**
21 **Environment and Parks 2015 Recommendations document**
22 **selecting SR1, which is at -- in the EIA in Volume 4,**
23 **Document 3.**

24 Q. All right. If we could return to Opus Report, Exhibit
25 101, pdf page 46?

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 THE CHAIR: Maybe just repeat that slowly,
2 Mr. Secord?

3 MR. SECORD: Exhibit 101, the Opus report, pdf
4 page 46, we've had it up before.

5 I've sent all of these to Ms. Friend. They should
6 all be pre-loaded.

7 THE CHAIR: Yes. Just allows our document
8 manager folks to get the numbers and page numbers in a
9 hurry. Thank you.

10 Q. MR. SECORD: In the MC1 Conceptual Design
11 report, it states, "MC1 can provide 93,000 dam cubed of
12 flood storage at PMF." Is this number accurate?

13 A. MR. SPELLER: It's Wayne Speller again --

14 MR. SECORD: And maybe the document manager
15 could scroll down so we can see the table? Thank you.

16 A. MR. SPELLER: Wayne Speller, Mr. Chairman.

17 The 93,000 appears in the bottom right-hand cell
18 of that table, yes.

19 Q. And how does that number compare to SR1?

20 A. MR. MENNINGER: I'd be happy to field that
21 question.

22 So, for SR1, if operated correctly, it will -- it
23 won't store beyond the 77,000 dams cubed that are
24 available within the reservoir. The project will
25 divert up until the reservoir is full, then the

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 diversion gates will close, and the water will continue
2 to go downstream.

3 So, in that case, we would store 77,000 dams cubes
4 from the reservoir. Then the remaining flows would
5 continue downstream.

6 Q. I thought there was some factor of safety that was
7 applied to the actual amount of water that was going to
8 be impounded. I thought there was some margin of
9 safety where you were factoring in a certain amount.
10 There would be sediment. How much actual flood water
11 would be diverted into --

12 A. MR. MENNINGER: Sure.

13 Q. -- into the reservoir as a result of a flood of record
14 like 2013?

15 A. MR. MENNINGER: Sure. So the -- our reservoir
16 capacity after construction is 77,000 dams cubed, give
17 or take.

18 The question that you're talking about, the factor
19 of safety at hand, is that we only need 70,000 for the
20 2013 designed flood event.

21 We offered some additional capacity, that
22 10 percent additional capacity, in case there was some
23 sediment accumulation in the reservoir or if there was
24 local rainfall that occurred in tributary to the area.

25 So it would depend that if -- depending on if this

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 is a hundred years from now or from five years after,
2 about the -- the true available storage, but there will
3 always be at a bare minimum 70; right after
4 construction, 77.

5 Q. So compared to McLean Creek, MC1 can provide 93,000 dam
6 cubed of storage, MC1 can provide 77,000 dam cubed of
7 storage. Do I have the comparison right?

8 A. MR. MENNINGER: I believe you may have misspoke
9 there. MC1 93,000; SR1 77,000 as -- as proposed for
10 operation. We do have the capacity in case of a gate
11 failure to have a surcharge storage within the
12 reservoir up to an additional 30,000 dams cubed up to
13 the 1212 elevation in the reservoir, and that would be
14 for that passage to the emergency spillway if
15 necessary, but not in planned operation.

16 I would note that our simulations do indicate that
17 the outflow from SR1 would be 2100 cubic metres per
18 second going downstream during that scenario because we
19 would shave off 600 off of the peak of that 2770, where
20 as the MC1 scenario, as presented, uses up the
21 reservoir capacity before the peak arrives during the
22 PMF, and so it passes 2600 through versus the SR1 would
23 only be sending 2100 downstream.

24 But I should say that both of these are the
25 probable maximum flood which is a scenario that is hard

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 to put an estimate on, but many put it in the 1 in
2 100,000 to 1 in a million-year recurrence interval
3 timelines. So it is a .001 percent chance event. But
4 in either case, those are the -- the expected
5 operations.

6 Q. In terms of managing overall flood risk, is SR1 still
7 equal to MC1 when all information is considered?

8 A. MR. MENNINGER: Where are you referring to?

9 Q. Well, let's -- let's look at this proposition. Is it
10 not true that MC1 can reduce river flow rates to 212
11 cubic metres per second in a design flood of 1,240
12 cubic metres per second, where as SR1 can only reduce
13 them to, best case, 640 cubic metres her second? So
14 would you say those -- would you say those two -- would
15 you say those two outcomes are equal?

16 A. MR. MENNINGER: I would point out that there is a
17 bit of a flaw in that simplistic review. Based off of
18 our understanding of the 2013 event, there was about
19 30,000 dams cubed of rainfall that fell between SR1 and
20 MC1 -- between MC1 and SR1 that would have contributed
21 to that peak flow of 212. We don't expect that that
22 would have increased it to 640.

23 So for the segment between MC1 and
24 Glenmore Reservoir, there are portions that would have
25 faced a higher flood risk underneath the SR1 scenario

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 versus the MC1. Downstream of the Glenmore dam, which
2 was the target for the design of the SR1 one, they
3 are -- actually for both facilities, they're equal.

4 So downstream of Glenmore Reservoir, flood risk to
5 those communities is equal performance.

6 Q. And what was the dam cube number that you referred to
7 that was contributed by rainfall?

8 A. MR. MENNINGER: Sure. So let me -- so this is in
9 Exhibit 131, which was a -- if I can get the reference
10 correct. It is a response to Round 1C of package 3,
11 IR3-02 appendix -- there's quite a bit, but, anyway, in
12 Exhibit 131 on page 2517 of the PDF, we reported the
13 rainfalls that occurred upstream of MC1 and upstream --
14 then versus upstream of SR1.

15 Q. What was -- what was the number you used -- what was
16 the dam cube number that you came up with?

17 A. MR. MENNINGER: 32,000.

18 Q. So that's 32 dam cubed? Sorry, what was -- was it 32 --

19 A. MR. MENNINGER: Yeah, 32,000 dams cubed.

20 Q. 32,000 dam cubed?

21 A. MR. MENNINGER: Yeah.

22 Q. And where is that number shown?

23 A. MR. MENNINGER: So Exhibit 131. I believe it's
24 page 2517 of the PDF.

25 THE CHAIR: It's a large document. It's just

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 loading now.

2 A. MR. MENNINGER: Yes, actually, 2517.

3 MR. SECORD: Can you just enlarge that,
4 document manager?

5 Q. So where's the -- the 32,000?

6 A. MR. MENNINGER: Sure. In Table 9.1, as shown
7 there, the second row, the June 19th or the 22nd of
8 2013. These are the rainfall volumes for the 2013
9 flood event, and so you can see upstream of MC1 is
10 170,000 dams cubed. Upstream of SR1 is 202,000. So
11 the difference between those two is 32,000 dams cubed.

12 A. MR. SPELLER: And, Mr. Chairman, it's
13 Wayne Speller. Just to add -- just to tie something
14 together. Earlier when we were looking at the aids to
15 cross, there was a -- Matt Wood had pointed out that
16 those tables were a bit challenging because the MC1 row
17 had 212 metres cubed to flow in every scenario.

18 What Mr. Menninger is talking to here is, as this
19 table shows, is the rain or the tributary flows that
20 fall downstream of MC1. Those aren't captured. To get
21 a better picture, you'd have to add some kind of
22 equivalent flow there to that 212, rather than a
23 hypothetical that no additional water gets added to
24 that flow as it flows downstream.

25 Q. Do you have a -- in your records, the amount of flow

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 that is contributed to the Elbow River by the
2 tributaries above -- above SR1?

3 A. MR. MENNINGER: We don't have an exact record of
4 that. This is the closest that we've been able to do.
5 This is based off of a calibrated radar rainfall-graded
6 precipitation that was developed for the project, and
7 the gauge at Bragg Creek had some issues during the
8 2013 flood. And so some of that is challenging to
9 compare results of between.

10 I mean -- and the gauge at Sarcee Bridge also had
11 issues. So the primary hydrograph developed for 2013
12 is based off of the Glenmore Reservoir influence.

13 Q. So what was the problem with the gauge at Bragg Creek
14 and the Sarcee Bridge?

15 A. MR. MENNINGER: Sure. At those high flows, there
16 was damage to the channel and the facilities that
17 knocked out a portion of it or further readings for it.

18 Q. So these numbers in Table 9.1 are based on gauge data
19 at the Glenmore Reservoir?

20 A. MR. MENNINGER: No, these tables in 9.1 are based
21 off of -- these are rainfall totals. So these are
22 based off of rainfall gauges and radar observations
23 from -- for -- for the area.

24 Q. Rainfall gauges that were damaged at Bragg Creek?

25 A. MR. MENNINGER: No, no, I'm sorry. The stream

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 gauges were damaged there. You asked about flow.
2 There's a difference between flow rate in the river
3 versus rainfall. So the rainfall is measured in a
4 tube, and so you just measure how much falls, and so
5 those were not damaged. What was damaged was the
6 gauges in the river that were trying to measure
7 instantaneously the velocities and the depths of flow
8 within the river during a flood event.

9 So that's the differential. So when you asked
10 about the flow rates, we don't have an exact comparison
11 of what those inflows were, but we do know what the
12 total volumes -- the total volume differences or best
13 estimates based on rainfall, and that's what we're
14 seeing here.

15 Q. So just to be clear for the Panel, with respect to SR1,
16 what is the 77 million dam cubes storage capacity.

17 Mr. Menninger, you indicated it's the 2013 flood
18 volume plus 25 percent, so...

19 A. MR. MENNINGER: No, so the -- sure. So we used
20 engineering models to -- so we had the hydro graph from
21 the 2013 flood which is the flow rates over time
22 measured at Glenmore Reservoir, okay. So we took that
23 hydro graph and then we used engineering models to
24 estimate how much flow would have to come off of that
25 hydro graph over time to reduce the volume downstream.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 So that model incorporates both the diversion of
2 structure, this SR1 reservoir, and the
3 Glenmore Reservoir to determine the volumes necessary
4 in the reservoir and the diversion rate necessary at
5 the diversion structure to meet that requirement.

6 What we determined was the volume necessary in the
7 reservoir was 70 million dams cubed roughly. What we
8 did then was for the design is that we added an
9 additional 10 percent to the project in the design so
10 that we made sure that we had sufficient capacity over
11 the life of the structure, both to allow for localized
12 rainfall from the area that drains into the reservoir
13 and as well as potentials of accumulations.

14 So that 77,000 is what we designed the reservoir
15 to hold. What's necessary for the flood event is 70,
16 based off of the models.

17 Q. So is the 25 percent over and above the 10 percent
18 sedimentation projection?

19 A. MR. MENNINGER: So there are two different things.
20 So the 25 percent -- so that same model we also
21 determine flow rate required for diversion. So it's --
22 I apologize. It is a complicated system in terms of
23 that understanding, and often we like to have something
24 to point to.

25 But the diversion rate throughout -- from the

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 diversion structure through the channel and to the
2 reservoir required during that flood event is 480 cubic
3 metres per second max, you know. That's what's
4 required. We added a 25 percent capacity increase to
5 the channel to -- for that safety factor.

6 So that is the diversion channel capacity in terms
7 of its flow and how much could be diverted at a given
8 time verse -- and then the reservoir has an alternate
9 size and volume capacity.

10 So that's the differential.

11 Q. All right. I'd like to put a number of propositions to
12 you. One, given the extreme weather events impacting
13 dams in the United States and China, what is the
14 justification for using 2013 as the reference point?
15 What is the justification for using FOR as the
16 reference point?

17 A. MR. MENNINGER: All -- so all infrastructure needs
18 to develop a criteria or a level of service that you
19 design for, whether it's a road, a bridge, a dam, a
20 levy system along a river. You have to choose a point
21 and location for that level of service. The province
22 of Alberta selected the design of record which is --
23 which exceeds a 1 in 200-year event, and that is what,
24 you know -- was selected and moved forward upon.

25 Q. Do you know, does the province of Saskatchewan design

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 to 1 in 500-year events?

2 A. MR. MENNINGER: I'm not aware.

3 Q. Is anybody aware on the AT Panel?

4 A. MR. WOOD: Mr. Chairman, I am aware of that;
5 however, I would like to highlight that the flood
6 hazard mapping standard and flood risk standard in
7 Alberta is a hundred year. And as we mentioned
8 earlier, this is also the standard used by the federal
9 government of Canada.

10 Q. Second proposition. Do you agree that extreme
11 consequence dams are usually built to probable maximum
12 flood?

13 A. MR. MENNINGER: I do agree, and SR1 is designed to
14 pass the probable maximum flood.

15 Q. So your response -- your response is that SR1 can pass
16 a PMF?

17 A. MR. MENNINGER: Yes, safely.

18 Q. Do you think this is splitting hairs and will
19 effectively result in misplaced confidence that the
20 City of Calgary will escape another terrible flood?

21 A. MR. MENNINGER: No. I will say that during the
22 probable maximum flood, in any case, whether MC1 or SR1
23 or on the landscape, that there will be unforeseen
24 flooding that you -- that's uncomparable, ever observed
25 within the province.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 As I mentioned, the probable maximum flood has an
2 occurrence interval of somewhere in the order of 1 in a
3 million.

4 So SR1 or the 2013 event was a 1 in 200-year, so
5 we are talking about something as 1/500th -- or 500
6 times more rare than the 2013 event.

7 So I will point that out to start with.

8 No dams are designed to contain the PMF without
9 discharge in a context such as the structures. They're
10 designed to withstand and pass them safely through the
11 structure. So it's, similarly, MC1 and SR1 both do
12 that through the design of their spillways and the
13 associated elements in the project.

14 I will say that SR1, in particular, has the option
15 that during that 1-in-a-million-year event when there
16 could be that effect that threatening of the -- of the
17 large damn itself and the reservoir, we can shut off
18 the flow to the reservoir with the gates and leave all
19 the water in the river.

20 So we don't have to use our emergency spillway.
21 In the case of the MC1 that's proposed that that --
22 that proposed concept would utilize a 200-metre-wide
23 earthen auxiliary spillway to pass those flows.

24 Q. Yeah, Mr. Menninger, you discussed the rainfall
25 numbers. In making those calculations, was it assumed

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 that all the rain would go into the Elbow River?

2 **A. MR. MENNINGER:** For which scenario?

3 **Q.** The one that -- the one that we have up here, the --
4 the rainfall volumes that we have on the at Table 9.1?

5 **A. MR. MENNINGER:** Oh, yes, these that are shown in
6 Table 9.1 are those only observed within the
7 Elbow River watershed; that is correct.

8 **Q.** And is it assumed that all of that rainfall, then, goes
9 into the Elbow River?

10 **A. MR. MENNINGER:** No, no, there's -- like I said,
11 these are rainfall numbers. There are some -- you
12 know, during a period of time, you will see some
13 infiltration. There is also some obstruction from
14 trees and other elements. So no, it's not -- it's not
15 a hundred percent going into the river, but the vast
16 majority of it is.

17 **Q.** So do you know what quantity then gets absorbed by the
18 ground?

19 **A. MR. MENNINGER:** I could find that. It would be
20 within our report on -- I'll have to dig it up. Like I
21 said, I don't have it at the tip of my fingertips but
22 could locate it.

23 **Q.** Could you maybe get back to me on that at the break?

24 **A. MR. HEBERT:** Mr. Chairman, we can supply that
25 information at the break, if available.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 THE CHAIR: Thank you.

2 Q. MR. SECORD: Thank you.

3 Do you agree with this proposition that historic
4 records on the Bow River indicated there have been at
5 least two Elbow River floods that were bigger than
6 2013. Both of these occurred less than a 130 years
7 ago. Given that information, why was it -- why wasn't
8 a larger flood of record chosen?

9 A. MR. WOOD: Mr. Chairman, I can answer that.

10 The evidence available for the events on the Bow
11 does certainly suggest that there was floods happening
12 at the pre-record. On the Elbow, those anecdotal
13 accounts are not available.

14 And also again, I must say, you know, when we're
15 talking about the event of record, we do mean record,
16 and we do mean hydrometric record, and that on the
17 Elbow is from 1908 until present. And so we are
18 referring to two actual recorded events, not
19 speculative events.

20 Q. In terms of the Deltares report, Exhibit 13,
21 PDF page 7, it reads: (as read)

22 "As with all detention measures,
23 in-stream or off-stream, the effect of
24 storage heavily depends on expected
25 rains in possible flood hydro graphs,

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 accurate forecasts, and quick operation
2 of the gates. The conclusion on flood
3 reduction is clearly based on volumes."

4 Can you tell me what work was conducted to address
5 Deltares' concerns about the range of possible flood
6 hydrographs? So, for instance, has any work been done
7 on SR1 to determine its efficacy at various flood hydro
8 graphs?

9 **A. MR. HEBERT:** Mr. Chairman, I believe Matt Wood
10 could answer that question. It appears we lost
11 Mr. Menninger who --

12 **A. MR. MENNINGER:** I'm here, Mr. Hebert, but it says
13 that the host has stopped my video. So I'm here with
14 audio.

15 **A. MR. HEBERT:** I just wanted to confirm that
16 it is an area within Mr. Wood and Mr. Menninger's
17 expertise.

18 **A. MR. MENNINGER:** I'm back.

19 So we did look at the efficacy of SR1 for
20 different hydrographs.

21 **Q.** Were hydrographs flood events greater than 2013
22 considered?

23 **A. MR. MENNINGER:** Yes.

24 **Q.** And which -- what type of events, which hydrographs
25 were those? For what events greater than 2013, for

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 instance?

2 A. MR. MENNINGER: Well, for instance, we gave the
3 example of the probable maximum flood.

4 Q. Any others?

5 A. MR. MENNINGER: I believe we sim -- and as far as
6 a time series hydrograph, I believe the probable
7 maximum flood and the what we call those one third
8 between the thousand year and the probable maximum
9 flood, both of those scenarios were run with time
10 series as hydrographs through -- through the
11 structure -- through the diversion and into the
12 reservoir.

13 Q. Now, in terms of the Bragg Creek berms, Deltares
14 states, and I quote: (as read)

15 "MC has a small advantage for the hamlet
16 of Bragg Creek because no additional
17 measures are required to protect the
18 hamlet, but since the proposal for SR1
19 also includes flood protection measures
20 to be taken specifically for
21 Bragg Creek, this difference is small."

22 So let's imagine you're a Bragg Creek resident at the
23 moment. The 2013 flood has just about wiped out your
24 town, SR1 is chosen, and you get berms. The
25 City of Calgary's own triple bottom line analysis --

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 this is Exhibit 252 -- ranked berms for their own
2 residents far below upstream mitigation for the
3 esthetics, river access, views, and they alter the
4 natural river area, et cetera. Yet berms were chosen in
5 advance quickly for your town through a process between
6 Rocky View County and Alberta Transportation because SR1
7 was chosen.

8 So, meanwhile, while SR1 and the berms were both
9 originally 1 in a hundred of Level 1 to a hundred at a
10 level of protection, SR1 increased to 1 in 200
11 protection as mentioned in the Deltares report.

12 Can you tell me why was SR1 increased from 1 to --
13 1 in 100 to 1 in 200 in terms of its level of
14 protection, and why was -- why were the berms for
15 Bragg Creek left at 1 in 100 years?

16 **A. MR. HEBERT:** One moment, Mr. Chair.

17 **THE CHAIR:** Mr. Secord, just while they're
18 caucusing, you mentioned Exhibit 252, did you have a
19 page, and did you want --

20 **MR. SECORD:** I was referring to Exhibit 13, pdf
21 page 2, the FC1 report. It's also summarized in
22 Exhibit 325, pdf 8. I don't know that we need to turn
23 it up, but --

24 **A. MR. HEBERT:** Mr. Chairman, that's my -- I beg
25 your indulgence in making sure that -- the historical

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 records from that.

2 So, Mr. Chairman, in 2014, the Government of
3 Alberta decided to proceed with constructing -- or
4 decided to proceed with a storage volume in SR1
5 equivalent to the -- to the 2013 event, so that would
6 have been the event of record.

7 As part of that decision pursuing SR1, it brought
8 about very clear imperative that berming would have
9 been required in the community of Bragg Creek to
10 provide that community with the flood protection
11 required.

12 It's correct to say that Rocky View County is
13 pursuing that project, and it's a project that they've
14 undertaken, their proponent. Alberta Environment and
15 Parks provided funding for that project.

16 While I don't have all the technical details about
17 the project, we would note that it is designed to a
18 1 in 100-year level with a framework that essentially
19 would provide a level of protection to the -- to the
20 event of record.

21 I would also note, Mr. Chairman, that there are
22 berming projects in the City of Calgary. It would not
23 be fair to say that there are no berm projects that
24 have been -- that have been pursued in the city -- in
25 the City of Calgary.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 Q. Can AT confirm that Rocky View County has advised that
2 there may still be groundwater flooding with berms
3 because, in higher river valleys, the aquifer becomes
4 charged with water and basements can flood?

5 A. MR. HEBERT: Mr. Speller will provide a
6 response.

7 A. MR. SPELLER: Mr. Chairman, it's important to
8 note that groundwater flooding can occur with any of
9 the mitigations that we're discussing, be it SR1 in the
10 city, be it the MC1 option, even though it was still at
11 a conceptual stage, or berms, as long as flows on the
12 river at a certain level, especially if they're getting
13 to bank full, groundwater flooding is still a potential
14 risk for all of these options.

15 Q. Now, I think Mr. Hebert mentioned that the berms have
16 enough freeboard with a minimum level of .6 metres.

17 What about those hydrographs that Deltares
18 mentioned? What if the 2013 flood volume comes in a
19 different shape? How will those 1 in 100-year berms
20 hold up?

21 A. MR. HEBERT: Mr. Chairman, I might invite
22 Mr. Wood to provide that response, recognizing, again,
23 that the project in question is being led by a
24 different -- a different organization.

25 A. MR. WOOD: Thank you, Mr. Chair.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 I think this goes back to my rather off-the-cuff
2 comment about peak being the important -- the most
3 important part. You know, the events, if they come in
4 different shapes and forms, when it comes to flood
5 barriers or dikes or levies, or whatever you want to
6 call them, you know, it is that maximum peak that will
7 overtop -- overtop a barrier.

8 And so how it comes, whether it's, you know,
9 longer, drawn out or heavier on the front end, it all
10 comes down to that peak, and that peak is typically
11 what is referenced in the flood frequency as we've been
12 discussing.

13 So that really should change when we're talking
14 about different permutations in the storm. It's
15 typically in that temporal distribution and how that
16 volume arrives.

17 Q. In light of all this, would Bragg Creek residents not
18 still be better off with MC1 that can take the
19 1240 cubic metres per second and turn it into 212 cubic
20 metres per second, thus reducing their risk materially?

21 A. MR. HEBERT: Mr. Chairman, ultimately, the
22 province of Alberta chose to pursue the SR1 project,
23 bearing in mind set of factors and recognized that it
24 was critical that the community of Bragg Creek had the
25 protection it needed from -- from an event similar to

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 2013, and that's why it pursued the berming projects
2 that are now underway.

3 I hesitate to speculate about the impacts --
4 sorry, the benefits or the implications of a project
5 that was not pursued -- that's not been pursued in
6 any -- in any significant manner.

7 Q. And if a 2,000 cubic metre per second flood came down
8 the Elbow River and MC1 reduced it, as the Opus report,
9 Exhibit 101 indicates, to 830 cubic metres per second,
10 those berms at Bragg Creek would hold; correct?

11 A. MR. HEBERT: Well, Mr. Chairman, perhaps others
12 on the Panel could provide a -- the technical response.

13 Again, we're now dealing with a hypothetical
14 scenario about what projects would have been
15 contemplated had they been advanced to a detailed
16 stage. The scenario that -- that's been pursued by the
17 Government of Alberta was to advance an application for
18 the -- for the Springbank Reservoir project. Knowing
19 that, it had to pursue, speaking broadly as government,
20 the project of providing berms to the community of
21 Bragg Creek.

22 So I -- that's a -- that's a hypothetical question
23 about what projects would have been built in a
24 different scenario.

25 So I -- I hesitate to provide an answer on account

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 of the reality, which we're operating in right now of
2 how we actually advance flood mitigation for this --
3 for this particular stretch.

4 A. MR. WOOD: And if I may, Mr. Chairman, you
5 know, with the scenario, the hypothetical scenario
6 given, those berms would not be present in Bragg Creek,
7 and 830 cubes would be coming downstream out of MC1 and
8 flooding out that community. So...

9 Q. So how is it possible that SR1 plus berms at
10 Bragg Creek are equivalent to MC1?

11 A. MR. WOOD: The design basis to reduce flows
12 downstream of Glenmore to 170, they are equivalent.
13 The two different projects we've been discussing today
14 have various benefits at different locations of the
15 river, but, you know, they are on par in their design
16 basis at meeting the flows downstream.

17 I think what we're having to look at, and the
18 benefits starts to leave the economic and the flood
19 risk reduction realm into thing like environmental
20 benefits, and other impacts there between the two
21 projects.

22 So to answer your question specifically, they are
23 on par, much like what Deltares has suggested here.

24 Q. I guess it comes down to what you consider to be the
25 public interest and how is the public interest best

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 served; and, in this case, has not the choice of SR1
2 doomed the residents upstream of SR1?

3 A. MR. HEBERT: Mr. Chairman -- my apologies,
4 Mr. Secord, for interjecting -- Mr. Chairman, our
5 belief is that SR1 is in the public interest, and that
6 it provides the flood mitigation necessary on the
7 Elbow River to reduce the flows and provide the
8 accompanying storage.

9 I would not accept your characterization, however,
10 in that those communities are doomed and that the
11 Government of Alberta, with Rocky View County in the
12 case of Bragg Creek, have advanced a berming project
13 that would provide a level of mitigation for that
14 community.

15 So I -- Alberta Transportation would not accept --
16 accept that construct.

17 A. MR. WOOD: If I may, Mr. Chair, I would add
18 that the protection provided to those communities is in
19 accordance with the flood risk reduction standards of
20 the province.

21 THE CHAIR: Who's speaking there, sorry?

22 A. MR. WOOD: My apologies. It's Matt Wood from
23 Transportation.

24 THE CHAIR: Oh. Thank you.

25 Mr. Secord, it's just about 3 o'clock. If you're

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 pondering your next question, if you'd like a break to
2 do that, we can take a ten minute break now and then
3 come back after?

4 MR. SECORD: Yes, that would be fine. What
5 time would you like to be back?

6 THE CHAIR: Five after 3.

7 MR. SECORD: Thank you.

8 THE CHAIR: Thanks, everyone. Especially
9 mute, but stay signed on, please.

10 (ADJOURNMENT)

11 THE CHAIR: Mr. Wiebe, I think we're ready to
12 roll. Justin, are you there for MNP?

13 Mr. Secord, do you need an exhibit up for your
14 first question?

15 MR. SECORD: Yes, Exhibit 252. It's the
16 "Alberta Environment and Parks' recommendations on the
17 Elbow River Major Infrastructure
18 Decisions - October 2015." Doesn't appear to be on the
19 list.

20 So it'll have to be downloaded, document manager.
21 It's not there.

22 Maybe while the document manager is getting that
23 up, I can proceed with my questions, Mr. Chair?

24 THE CHAIR: Yes, I was just checking,
25 Ms. Decosemo, she was asking, 252?

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 MR. SECORD: Yes.

2 THE CHAIR: Yes, 252. Mr. Secord will
3 proceed, but, Ms. Decosemo, see if you can get 252 up
4 while he's asking his question.

5 Thanks, Mr. Secord.

6 MR. SECORD: Thank you.

7 Q. And this is referring to the "Alberta 2015
8 Alberta Environment (AEP) Report and Project
9 Effectiveness." It reads: (as read)

10 MC1 is onstream, closer to the
11 mountains, and more likely to trap rocks
12 and trees, putting the structure and its
13 operations at risk."

14 In hindsight, would it be safe to assume that the
15 debris, the debris conclusion was premature? For
16 instance, the debris deflector was not added to SR1
17 until 2018 after the EIA was filed. This was
18 approximately a \$10 million addition to the project, and
19 even in the December 2020 submissions, Exhibit 169, it
20 was increased in size.

21 Is it reasonable to conclude that debris was not
22 considered in the SR1 decision and perhaps the
23 conclusion that debris was a reason for choosing SR1
24 over MC1 is another judgment that was made without
25 evidence?

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 A. MR. HEBERT: Mr. Chairman, Mr. Wood is prepared
2 to provide that response.

3 A. MR. WOOD: Mr. Chairman, debris and sediment
4 and bed load have been a key consideration throughout
5 the design process, ever since the development of the
6 concept.

7 You'll see in the conceptual memorandum that was
8 used to size SR1, one of the reasons for adding the
9 25 percent factor of safety in its diversion capacity
10 was some consideration for debris.

11 In addition to that, in the design of the
12 diversion inlet, in the diversion structure, it was
13 designed with debris in mind and debris management, and
14 you can see some of the -- through the design pages,
15 through some of the design reporting, some of the
16 testing and things that went into that, the debris
17 deflection barrier was added in the subsequent stage of
18 the report and, in part, due to feedback from
19 stakeholders with respect to debris entering the
20 reservoir and being left in the reservoir.

21 So, as it is added as a redundancy to manage that
22 debris, it was done for several reasons, one of which
23 was stakeholder input.

24 MR. SECORD: Right. And document manager, can
25 you just pull to the front of Exhibit 252, PDF, the

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 very -- the cover page, yeah, cover page.

2 Q. What is this document?

3 A. MR. HEBERT: So, Mr. Chairman, the best way to
4 describe this document was a frame to support a
5 decision to ultimately advance a flood mitigation
6 project on the Elbow River -- or to provide some
7 context for the Panel, this came at a point in time
8 that Springbank, the Springbank Reservoir project had
9 been advanced for addition review and studied by the
10 Government of Alberta.

11 For -- for point of reference, in the spring of
12 2015, there had been a change in government, there had
13 been an election, a new government was elected. The
14 government of the day commissioned a review of the --
15 the selection of SR1.

16 We've referred to the Deltares report, that was
17 a -- that was a third party, an independent third
18 party, that was commissioned by the government to
19 conduct the review. Ultimately, Deltares reached
20 certain conclusions.

21 This particular document was assembled by
22 Ministry of Environment and Parks to -- to outline the
23 rationale to -- to select -- to justify the selection
24 and then, ultimately, the advancement in the end of the
25 SR1 project.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 Q. Right, and if we go to PDF page 1, it mentions in its
2 summary what you mentioned about a Dutch research
3 foundation, Deltares, was commissioned to review the
4 original proposal reports.

5 And when I go through this six-page document, I
6 don't see anybody who signed it. Can you tell me, who
7 was it who created this document? Who wrote it?

8 A. MR. HEBERT: So, Mr. Chairman, this was a
9 document that was prepared by the Department of
10 Environment and Parks, the individuals responsible for
11 water management or water mitigation projects within
12 the government.

13 Q. And who was that?

14 A. MR. HEBERT: Mr. Chairman, I don't have the
15 specific names, but I think it's fair to say that this
16 document was -- was authored by officials in the
17 Department of Environment and Parks and then,
18 ultimately, issued under its name.

19 Q. And is that typical of government? Like, is that how
20 Alberta Transportation does it? You have
21 recommendations for a major infrastructure decision,
22 but just comes out on Alberta Transportation letterhead
23 and nobody signs it, nobody puts their name to it? Is
24 that typical of how government operates?

25 A. MR. HEBERT: Mr. Chairman, it varies -- sorry,

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 **Mr. Secord.**

2 Q. Is that typical of how Alberta Transportation works
3 when you do a recommendations document? Nobody's name
4 appears on it? It's anonymous?

5 A. **MR. HEBERT:** **Mr. Chairman, typically, when a**
6 **department issues the document, it gets issued in the**
7 **department's name under the appropriate authorities**
8 **that -- that underpin the organization covered.**

9 Q. Now, in terms of project effectiveness, dealing again
10 with debris, according to Rocky View County, 41,000 --
11 41,300 cubic metres of riprap is needed to create the
12 Bragg Creek berms. In 2013, Redwood Meadows lost so
13 much riprap, huge rocks washed down the river and do
14 you know, does Alberta Transportation know where all of
15 these rocks -- where all these rocks went down the
16 river?

17 So just let me -- maybe I can back this up a
18 little bit.

19 In terms of what you were talking -- we were
20 talking about this debris deflected that you put in and
21 the ability to trap, you know, rocks and trees.

22 So is Alberta Transportation aware that, in 2013,
23 Redwood Meadows lost a lot of riprap and huge rocks
24 washed down the Elbow River. Is AT aware of that?

25 A. **MR. WOOD:** **Mr. Chair, I can agree to that.**

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 Q. And we know that berms are being put in place in
2 Bragg Creek to protect them against a 1 in 100-year
3 flood. So in the event of a flood of record or, god
4 forbid, something worse, a 1 in a thousand-year flood
5 or a PMF, will these rocks be snagged on the debris
6 deflector? Or is that only designed for trees?

7 A. MR. WOOD: Mr. Chairman, I think it would be
8 a little bit -- little bit speculative in what would
9 happen in a thousand-year event or a PMF event, but
10 what I can say is, while we don't know exactly where
11 the rocks that were transported downstream ended up,
12 the Elbow River does undergo various states of
13 confinement between Bragg Creek and the diversion
14 structure; and when that confinement is lost, meaning
15 that the channel has widened, for example, the area
16 around Redwood Meadows, the flows tend to splay out,
17 they lose some of their velocity, and the ability to
18 entrain large particles within them.

19 So it is very likely, although I must admit, we
20 haven't done this, if you went poking around in some of
21 the gravel bars and below the surface in some of these
22 widened out areas that you would find these rocks.

23 Now, specific to Mr. Secord's question about those
24 rocks arriving at the debris barrier, should they
25 arrive there, and we can treat them like any other

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 piece of heavy debris, the debris barrier has been
2 designed to take impact from large, heavy objects,
3 that's described in the PDR report and as well as the
4 forces from accumulation of debris on it.

5 When wood accumulates on the rack, it will
6 experience a certain amount of drag force if it's
7 pushing on the rack, and it's been designed to mitigate
8 that.

9 Q. Would it be safe to conclude that SR1 has a larger
10 debris problem than MC1 one?

11 A. MR. WOOD: Mr. Chairman, I believe I can
12 answer that.

13 I don't know if we can talk specifically about
14 what aspects of the problem, but given its location in
15 the mountains, MC1 is subject to considerable large
16 amount of bed load. It is a very confined section of
17 river, so it doesn't have that benefit of natural
18 deposits of wood and things dropping out and flood up
19 above it, and so everything that's coming down is
20 arriving at that structure.

21 Q. All right. Would it be fair to say that additional
22 debris from upstream flood mitigation may impact SR1,
23 but could not travel upstream to where MC1 is?

24 A. MR. WOOD: There's a very remote chance that
25 a piece of riprap could make it down to the SR1

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 diversion structure and, obviously, it would not travel
2 upstream to MC1.

3 However, again, and maybe in addition to my
4 previous answer, I do want to point out that Opus, in
5 their design report, indicated that the permanent pond
6 utilized at MC1 is for sediment and debris management,
7 and I believe in that report, there was some estimates
8 made on how quickly bed load and debris could arrive at
9 the structure, and that gives some indication of how
10 frequently that pond may need to be cleaned out to
11 manage such debris.

12 Q. Is it fair to say that with MC1, millions of dollars of
13 riprap at Bragg Creek and Redwood Meadows would not
14 likely wash down the river, but may wash down the river
15 as a result of SR1?

16 A. MR. HEBERT: Mr. Chairman, as I referred to
17 earlier, we could -- we can certainly provide a
18 speculative response about the impacts of McLean
19 Creek's effects on other communities.

20 Certainly, in the case of Bragg Creek, that
21 project is ensuing, and there are existing berms at
22 Redwood Meadows.

23 So we're not -- we don't feel quite comfortable or
24 in a position to provide a speculative answer of that
25 nature.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 Q. In terms of environmental impacts, and, again,
2 referencing page 2 of Exhibit 251 and the Opus report,
3 Exhibit 101, relating to MC1, page 4 -- you don't need
4 to -- document manager, you don't need to turn those
5 up, but these are my references -- it says: (as read)
6 "MC1 would require the removal of trees
7 and vegetation from the reservoir and
8 irreparably alter the habitat for
9 wildlife and fish populations."

10 Do you agree that it is -- that with what that -- with
11 what we know today about SR1, we haven't found one
12 positive environmental outcome of SR1?

13 A. MR. HEBERT: Mr. Chairman,
14 Alberta Transportation wouldn't accept the conclusion
15 of that question.

16 We've noted, or the AEP document notes, the
17 environmental effects of SR1 in a particular case
18 cited. We have no reason to believe that isn't true.

19 Mr. Chairman, we'd also acknowledge that there are
20 environmental effects to SR1. They're not gone into
21 any great depth yet in this hearing, but all things
22 considered, we are confident that the items that are --
23 the areas which there are impacts can be -- can be
24 properly mitigated, or in the event that the
25 mitigations aren't satisfactory, that

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 **Alberta Transportation is committed to ensuring that**
2 **the appropriate mitigations are in place.**

3 **Q. Right. You would agree, though, that at MC1, the dam**
4 **would create lake habitat, which would benefit diving**
5 **waterfowl and other water birds and create new**
6 **wintering habitat for fish. That was a conclusion**
7 **reached in the Opus report?**

8 **A. MR. HEBERT: Mr. Chairman, one moment. I**
9 **believe Mr. Speller will respond.**

10 **A. MR. SMITH: I'm sorry, could you repeat the**
11 **question, please?**

12 **Q. Can you confirm that MC1 would create lake habitat**
13 **which would benefit diving waterfowl and other water**
14 **birds and create new wintering habitat for fish?**

15 **A. MR. SMITH: Mr. Chairman, I think it's fair,**
16 **and certainly the work we did acknowledges that it**
17 **would change it to that sort of habitat. But I would**
18 **also say that that's a trade-off against the loss of**
19 **other habitats.**

20 **Q. And in relation to SR1, Alberta Environment said in its**
21 **deeming the EIA -- IA complete letter, Mr. Christiansen**
22 **said that bull trout would be extirpated at certain**
23 **reaches of the Elbow River as a result of SR1?**

24 **A. MR. HEBERT: Mr. Chairman, that memo does make**
25 **that conclusion, although we would submit to the Panel**

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 that similar considerations would be at play as it
2 relates to the bull trout as it pertains to the
3 McLean Creek option.

4 Q. And can you confirm that SR1 has about 130 acres of
5 trees that would be deforested compared to 150 acres
6 for MC1?

7 A. MR. HEBERT: Mr. Brescia can provide a
8 response.

9 A. MR. BRESCIA: Mr. Chairman, subject to check,
10 both those numbers sound approximately correct. Both
11 projects would result in the loss of trees.

12 Q. In terms of social and recreational value, and again
13 we're referring to the same exhibits, Exhibit 252,
14 page 2, the anonymous Alberta Environment AEP
15 recommendations and the Exhibit 101, MC1, page ES-2,
16 and again, you don't need to turn those up. AEP
17 includes eight points on this, seven of which highlight
18 the losses in MC1 area if the project were to proceed.

19 And the point on SR1 is: (as read)

20 "SR1 affects grazing and ranchlands for
21 a small number of Albertans."

22 Can you confirm that there is no mention of Kamp Kiwanis
23 and Moose Hill Ranch which both provide recreational
24 opportunities; would you agree that AEP's statement was
25 an oversimplification?

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 A. MR. HEBERT: Mr. Chairman, certain -- it's
2 possible that it did not include every -- every
3 potential reference.

4 Alberta Transportation has recognized the effects,
5 potential effects of the project on Kamp Kiwanis as we
6 referenced in our hearing submission. Alberta
7 Transportation has been engaging with Kamp Kiwanis
8 relating to those impacts.

9 Certainly as it pertains to the Moose Hill Ranch,
10 and you'll have to forgive me, I believe that's a
11 reference to -- is that Ms. Robinson's property,
12 Mr. Secord?

13 Q. Do you know what Moose Hill Ranch is, Mr. Hebert?

14 A. MR. HEBERT: It's -- I believe it's
15 Ms. Robinson's property; I just wanted to make sure I'm
16 speaking correctly.

17 Certainly we have an interest in discussing with
18 Mary, Ms. Robinson, the impacts of the project on her
19 property. It's not -- it's something that we are
20 keenly interested in pursuing.

21 Q. Does AT acknowledge that the parking structure at the
22 MC1 structure, the Allen Bill Pond, et cetera, would be
23 damaged in another flood event like 2013?

24 A. MR. WOOD: Mr. Chairman, I don't believe
25 Allen Bill Pond has been fully rebuilt since the 2013

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 flood.

2 It addition to that, since we are speaking of
3 alternatives and comparisons here, those would be
4 completely under the footprint of the MC1 option.

5 Q. Why was the decision made to avoid flood mitigation
6 upstream of Paddys Flats on the Elbow River when
7 evidence shows that destructive damage to riverbanks,
8 highways, trails, picnic and camping ground areas from
9 the flow surge in 2013 occurred?

10 A. MR. WOOD: Mr. Chair, I'm familiar with
11 Paddys Flats area; it's relative located in the head
12 pond of the MC1 option. Upstream of that, there is
13 no -- no private infrastructure. Aside from the odd
14 day use area, there's nothing really of any major
15 value.

16 So what Mr. Secord references as far as erosion,
17 and I can't remember the second item that he mentioned,
18 but these are all natural processes that are happening
19 in a natural environment. There would not be much
20 benefit to mitigating effects there.

21 Q. Did the proponent consider that MC1 could prevent
22 future damage to this park infrastructure once replaced
23 out of the MC1 footprint?

24 A. MR. HEBERT: Mr. Chairman, in the case of the
25 recreational properties described here, I think that

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 the Panel appreciates that this is within -- within
2 Kananaskis country. I think it's familiar to most
3 Albertans, the extent to which these recreation areas
4 are used by the public in significant interest,
5 significant demand for these areas.

6 Certainly these areas should -- should the
7 government had proceeded with the MC1 option, certainly
8 government could have pursued the replacement of these
9 areas, but that could have posed a significant earth
10 shaking (verbatim). We're dealing with limited areas
11 of the province to re-create these experiences. And
12 it's certainly a factor in the decision to not -- to
13 not proceed with the MC1 option as is illustrated on
14 page 4 of Exhibit 452.

15 Q. Now, Deltares' report declared that MC1 and SR1 can be
16 adapted for climate change. What does this mean? How
17 can SR1 be adapted for climate change?

18 A. MR. WOOD: Mr. Chair, SR1 has already been
19 designed with consideration for climate change. You
20 can see this in several of the responses leading up to
21 the hearing.

22 The 25 percent factor of safety was compared with
23 the potential analyses that are commonly done to assess
24 the impacts of climate change, and it was shown that --
25 that -- that that 25 percent was sufficient in its

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 design.

2 In addition to that, something I mentioned earlier
3 today is that the project does provide increased water
4 security at Glenmore, and that, in itself, is a -- is a
5 good mitigation for the potential for droughts,
6 specifically for the water supply to the city.

7 Q. And what does actually that mean, "can be adapted for
8 climate change?"

9 A. MR. WOOD: I'm not too sure, Mr. Chair. I
10 believe you'd have to ask Deltares that.

11 Q. Now, in 2014, AMEC made the following statement, and I
12 quote: (as read)

13 "March et al. 2007 assessed the impact
14 of climate change on surface and water
15 supply in the SSRB, that's the South
16 Saskatchewan River Basin. Their study
17 indicated that temperatures could
18 increase between 1.5 percent Celsius and
19 2.8 -- sorry, 1.5 degrees Celsius and
20 2.8 degrees Celsius in this region by
21 2050 which would increase evaporation
22 and evapotranspiration levels. This
23 would lead to potential changes in
24 annual flow of rivers with potentially
25 significant declines in flow during

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 summer season. This is important as
2 large majority of water demand occurs
3 during the season. The study showed
4 in-stream flows could decrease by an
5 average of 8.4 percent across all
6 basins."

7 So did the proponent consider the impact of the South
8 Saskatchewan River Basin on SR1, and if so, how?

9 A. MR. HEBERT: Mr. Speller will --

10 A. MR. SPELLER: Mr. Chairman, it's Wayne Speller.
11 I just wanted to ask a clarification.

12 Mr. Secord, it seemed like you were reading from a
13 document. What were you -- is it an exhibit you can
14 point us to?

15 Q. I just have this quote from an AMEC report from 2014,
16 Mr. Speller, so it's just --

17 There's just general propositions, perhaps you
18 don't agree with it, that there's going to be an
19 increase in temperatures which will increase
20 evaporation and evapotranspiration levels, it could
21 lead potential changes to manual flows in the river,
22 potentially significant declines in the summer season,
23 perhaps as much as decreasing flows by 8.4 percent
24 across all basins.

25 Do you have any reason to disagree with those

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 general propositions? Do you have some different
2 numbers -- or do you have some different numbers that
3 you'd like to share with us?

4 MR. FITCH: Mr. Chair, it's Gavin Fitch.
5 Mr. Speller beat me to the punch here.

6 We've given my friend a great deal of latitude in
7 his questioning, but to simply read quotes from a
8 document that seems like it's not in evidence and he
9 can't even give us a reference is not appropriate. If
10 he wants to find a reference so we know what document
11 he's referring to so the witnesses have it in front of
12 them, then I'm sure they'll be happy to answer the
13 question.

14 MR. SECORD: Well, Mr. Chair, it actually has
15 taken quite a bit of time, quite a bit of my
16 cross-examination time for documents to be pulled up,
17 then quite a bit of my cross-examination time while
18 Mr. Fitch's clients caucus, and then quite a bit of
19 them for them to get back to me.

20 So I just have very general proposition, climate
21 change, increasing temperatures, decreasing river
22 flows. Mr. Speller, do you agree that by 2050, those
23 propositions are likely to be found?

24 MR. FITCH: Before the witness responds --

25 MR. SECORD: I -- I --

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

- 1 MR. FITCH: Mr. Secord, Mr. Secord --
- 2 MR. SECORD: I'm abandon --
- 3 MR. FITCH: -- give me a second.
- 4 MR. SECORD: I'm abandoning --
- 5 MR. FITCH: It's apparently Exhibit 50 --
- 6 MR. SECORD: I'm abandoning -- I don't need the
7 document.
- 8 MR. FITCH: All right.
- 9 MR. SECORD: Let's move on. You're just taking
10 up my time.
- 11 MR. FITCH: I was going to say I've got the
12 exhibit number, but if you're moving on, that's fine.
- 13 MR. SECORD: That's fine.
- 14 THE CHAIR: All right, Mr. Secord.
- 15 Q. MR. SECORD: Mr. Speller, Mr. Speller, over to
16 you.
- 17 A. MR. SPELLER: Mr. Secord, I don't -- again,
18 without seeing the document, there's a number of
19 climate change projections for the region. I don't
20 have a reason to disagree with it, but I also can't
21 agree with it without seeing it.
- 22 Q. So has the proponent considered the impact of
23 increasing temperatures and potential changes in annual
24 river flows in terms of adapting SR1 for climate
25 change?

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 **A. MR. WOOD:** Mr. Chairman, I think maybe if I
2 could ask Mr. Secord to rephrase his question.

3 What specific aspects of climate change are we
4 speaking of? You talked about lowering of river flows
5 and also changes in high flow. I'm not clear here.

6 **Q.** Sure. Well, I asked you, Mr. Wood, did Deltares
7 declare that MC1 and SR1 can be adapted for climate
8 change? And so I'm just wondering how can -- how
9 will -- how can SR1 be adapted for climate change in
10 the event of increasing temperatures, decreasing river
11 flows? How is that possible?

12 **A. MR. WOOD:** As a flood mitigation project, if
13 there's decreasing river flows, then SR1 would not need
14 to accommodate that, and I already explained how it was
15 adapted for the flip side of that, which is the
16 potential for larger floods.

17 **Q.** And does the proponent acknowledge the statement in the
18 Opus MC1 2017 report, Exhibit 101, PDF page 55, that
19 MC1's water storage could be increased in times of
20 drought?

21 **A. MR. HEBERT:** Well, Mr. Chairman, I'd emphasize
22 that that was a conceptual document, essentially advice
23 from the consultant that had completed the report.
24 Ultimately the government of Alberta opted to proceed
25 with the development of a flood mitigation project on

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 the Elbow River with -- it did not include the
2 consideration of other items.

3 We would note that the addition of other items to
4 a project would increase its complexity, its scope,
5 potential costs, and the ability to progress a project
6 of a nature through the regulatory process.

7 Q. And, Mr. Hebert, you'll note in that document, it
8 states, and I quote from PDF page 55: (as read)

9 "It should be noted that the preliminary
10 operating strategy for MC1 is focused
11 primarily on flood management; however,
12 the permanent storage of the facility
13 can also be used to provide additional
14 water supply in the event of an extreme
15 drought. If needed, the project's
16 35,000 dam cubed permanent storage
17 volume could be utilized to augment flow
18 releases during a severe drought period,
19 depending on the value associated with
20 this type of flow augmentation
21 capability. It may even be desirable to
22 increase the project permanent pool
23 level. This could be assessed as part
24 of future optimization studies should
25 the project advance past the conceptual

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 level of study."

2 I take it that SR1 has no such capability of being
3 adapted for climate change?

4 A. MR. HEBERT: Mr. Chairman, the reference that
5 is on page 43 of Exhibit 101 is an assessment.

6 As I referenced, the government of Alberta chose
7 to progress a flood mitigation project on the
8 Elbow River as being the best approach for that river.

9 As a reference, the project that's contemplated in
10 the advice provided by Opus would have increased its
11 size, complexity, the nature of its regulatory review,
12 potential costs as I've -- I referenced this morning as
13 it's Transportation's position, the driving objective
14 is to have a flood mitigation reservoir placed on the
15 Elbow River, subject to regulatory approval, and in the
16 most effective and timely manner possible.

17 In terms of whether SR1 could -- could conduct the
18 same approach, the same caution applies, it would
19 change the nature of the project.

20 Certainly it would change the nature of the
21 environmental assessment, costs, benefits, and the --
22 this would apply to both SR1 and the MC1 option, the
23 dynamic in which such projects would -- would be
24 received by the broader -- by broader stakeholders in
25 the community.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 So automatic on that point, as I referenced this
2 morning, the approach towards water management, water
3 storage is the options that are being considered for a
4 project on the -- on Bow River.

5 Q. In terms of consultation and engagement, and this is
6 Exhibit 325, Ian Dowsett's assertion is that between
7 SR1 and Glenmore, the level of protection is -- this is
8 -- and the Glenmore Reservoir, the level of protection
9 is 1 in 50, and Mr. Dowsett states the residual flood
10 risk downstream of SR1 and upstream of the
11 Glenmore Reservoir from 640 cubic metres per second
12 during a 2013 flood event is similar to that of a 1 in
13 50-year flood. Stantec does not dispute this but does
14 note that this is a considerable reduction in flood
15 risk to these properties.

16 Was this impact considered during the original
17 decision to choose SR1 over MC1, and if not, why not?

18 A. **MR. HEBERT:** Mr. Chairman, I'm not sure if we
19 know that was a consideration. As I referenced earlier
20 today, the implication for -- for flood mitigation at
21 those points along the Elbow River are within the
22 authority or jurisdiction of the particular
23 municipalities, and certainly it's within their purview
24 to determine the appropriate nature of flood mitigation
25 for those -- for those localities.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 Q. So in order to, say, get the Springbank residents and
2 the Calgary residents below 160 cubic metres per second
3 as is targeted for the Calgary residents who are
4 downstream of the Glenmore Reservoir, what would need
5 to happen for flood mitigation?

6 A. MR. HEBERT: Mr. Chairman, just so I'm clear,
7 you're referring to communities between the diversion
8 structure of the Glenmore Reservoir?

9 Q. Yes.

10 A. MR. HEBERT: So as I referenced, Mr. Chairman,
11 ultimately those are -- those are matters that are
12 within the jurisdiction of the local municipalities in
13 question; in that case, Rocky View County and the
14 City of Calgary. They would have to come to a
15 determination of what appropriate flood mitigation
16 would be in those instances.

17 Q. So -- so was the -- was Rocky View County and the
18 City of Calgary, in terms of your engagement and
19 consultation, were they advised that the residual flood
20 risk downstream -- sorry, that the -- that the residual
21 flood risk downstream of SR1 would be similar to a 1 in
22 50-year flood event?

23 A. MR. HEBERT: Mr. Chairman, I'm not aware;
24 however, I can say in the engagement that we've had in
25 the course of developing this project, that those items

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 have not been identified. Doesn't mean that they're
2 not considered in plans or considerations on the part
3 of those two municipalities. It would fall within --
4 like I said would fall within the jurisdiction of those
5 two municipalities to determine the flood mitigations
6 that are required if needed.

7 Q. What about Mr. Wood, with his meetings with CRCAG and
8 Flood Free Calgary, did he have discussions with those
9 groups that the residual risk of downstream of SR1 and
10 upstream of the Glenmore Reservoir would be similar to
11 a 1 in 50-year flood?

12 A. MR. WOOD: I can't speak to Flood Free
13 Calgary or the CRCAG group, but my discussion with the
14 City of Calgary, they are aware of the residual flow
15 coming in.

16 I must point out that they do not have much -- the
17 City of Calgary itself does not have much for
18 development in -- in that area, and in fact, they don't
19 have any development within what is being called the
20 approximately the 50-year area here, close to saying
21 maybe Discovery Ridge, and that is not susceptible to
22 flooding in this situation.

23 I would also like to point out that development in
24 the valley downstream of the diversion structure is
25 relatively sparse. There are some residences; part of

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 Rocky View County, there's some golf courses. Again, I
2 must emphasize that they've received a considerable
3 reduction of flood risk going from 1,240 CMS down to
4 640. That means many of the properties that line --
5 buildings that line the terraces of the floodplain, the
6 upper parts of the floodplain, do not get flooded; it
7 is only those who have built very close to the river
8 who may get flooded.

9 And I must also point out that currently that land
10 is designated as floodway under the hazard mapping
11 policy. These are the maps that are currently online
12 from the province, and those maps show that development
13 is supposed to be regulated in that area.

14 And so what we're talking about is the areas very
15 close to the river that are currently at flood risk,
16 and it provides a reduction of flood risk to those who
17 are slightly up above that on the terraces, but those
18 who are down low may still have the problems in a 2013
19 event that they get for living near the river.

20 Q. Mr. Hebert, can you tell me why the Opus report,
21 Exhibit 101, which is dated 2017, why it was not
22 provided until 2019?

23 A. MR. HEBERT: Mr. Speller will provide a
24 response.

25 A. MR. SPELLER: Mr. Chairman, the Opus report

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 that's referenced was used as a reference material to
2 the 2018 EIA. It's referenced in a number of spots.
3 It was provided in its entirety in the Round 1 SIRs at
4 the request of the regulator. We don't provide the
5 majority of our reference material as full documents;
6 it's a lot of documents.

7 Ones that were specifically asked for, like this
8 one by the Regulator, were provided.

9 Q. And Mr. Speller, were you aware of the report when it
10 was created in 2017?

11 A. MR. SPELLER: The -- no, I became aware of it
12 when I joined the project near the end of 2017, not
13 when that report was created.

14 Q. And so who at Stantec would have got the Opus report?
15 Did it come to Stantec, did it come to AT?

16 A. MR. HEBERT: Mr. Chairman, just one moment.
17 Mr. Chairman, it was a document commissioned by Alberta
18 Transportation.

19 Q. So then the AT witnesses, it would be Mr. Hebert,
20 Mr. Swenson, and I guess Ms. Carignan, it's apparent to
21 the SCLG that in the 2017 Opus report, MC1 had superior
22 flood mitigation outcomes. When the 2017 highlighted
23 the superior flood mitigation outcome, what did AT do
24 with that information? Did you communicate that
25 information to the City of Calgary or to Rocky View

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 County whose residents would receive more protection
2 with MC1?

3 **A. MR. SVENSON:** Mr. Chairman, this is
4 Mark Swenson, I'll answer that one.

5 Yes, once Alberta Transportation had the report
6 from Opus and the associated environmental --
7 environmental studies from Hemmera, we did discuss
8 those with some of the stakeholder groups, including
9 the City of Calgary and Rocky View County.

10 **Q.** And when did that occur?

11 **A. MR. SVENSON:** We would have to look into the
12 record of -- of communication with them to know those
13 exact dates.

14 **Q.** Would you undertake to provide me with those dates and
15 the record of -- of the McLean Creek MC1 Dam updated
16 conceptual design report final, dated August 23rd,
17 2017, can you actually provide me with the records of
18 when those consultations were held that dealt with this
19 August 23rd, 2017, document?

20 **A. MR. HEBERT:** Mr. Chairman, subject to the
21 advice of counsel, we'll take that as an undertaking.

22 **UNDERTAKING - TO PROVIDE THE DATES WHEN**
23 **THE CONSULTATIONS WERE HELD THAT DEALT**
24 **WITH THIS AUGUST 23RD, 2017, DOCUMENT**

25 **Q. MR. SECORD:** And this document -- and this

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 document was created fully two years after exhibit --
2 the anonymous Alberta AEP recommendations, dated
3 October 2013, marked Exhibit 252?

4 THE CHAIR: Mr. Speller will provide an
5 answer.

6 A. MR. SPELLER: Is Mr. Chairman, just context on
7 the different documents we're discussing.

8 So the AEP recommendations dated 2015 did not
9 include the Opus report because it was in 2017. I know
10 I'm stating the obvious.

11 The Opus 2017 report and the Hemmera 2017 report,
12 if you read the introductions for those, they were
13 generated, not tied to project selection. At this
14 stage, the project had been selected to be SR1 in 2017.
15 They were generated to support the alternatives
16 assessment that was included in the EIA, and this is
17 clearly laid out in their introductions of both. And
18 my understanding is in talking to the folks who have
19 done it and my time on the project is there's a
20 concern, or there's a subjective nature to
21 understanding how much alternatives information should
22 be included in the filing of the EIA related to MC1,
23 especially through discussions with the federal
24 regulator and what they need 'cause their needs are
25 different from an alternatives assessment than

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 provincially. And that's why those documents were
2 submitted at that time.

3 MR. KENNEDY: Sorry, I'm going to jump in. It's
4 Bill Kennedy, Madam Court Reporter.

5 I'm wondering, as we generate undertakings, if we
6 could make sure we get a clear description of the
7 undertaking, and I'm going to suggest that we assign a
8 number to each undertaking given just in terms of
9 tracking them as we move through the proceedings.

10 THE CHAIR: Thank you, Mr. Kennedy. So at the
11 end of the day, maybe we'll wrap that up. We've got
12 two, I believe, the one that was just requested, but at
13 the end of the day, let's wrap that up so we can make
14 that clear for everyone. Thanks, Mr. Kennedy.

15 And in that last segment, Mr. Speller, I think I
16 got everything you said, so no problem, but others may
17 have -- I'm not sure if anybody else experienced a bit
18 of a break in his voice a bit, or perhaps it was on our
19 end here in Edmonton in our downtown office. Did
20 anyone else have issues hearing Mr. Speller? Sounds
21 like Ms. Vance and I are in the Edmonton office. So
22 but I think I got it, so please proceed.

23 Mr. Secord.

24 MR. SECORD: I'm just -- Mr. Chair, I'm just
25 going through my list of questions I have. I'm hoping

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 to meet my -- my time allocation, and I have more
2 questions than I'm going to be able to get through, so
3 I'm just sort of reviewing them now.

4 THE CHAIR: I'm glad you spoke up, I was
5 wondering if my audio was out, so thank you.

6 MR. SECORD: No.

7 Q. All right. I think what I'm going to do is move to the
8 benefit cost analysis, and if we could pull up
9 Exhibit 159, Appendix D2. And that one is there.
10 Good. Excellent. It takes a little while to verify
11 the signatures when you -- are you putting that up,
12 Zoom host?

13 MR. WIEBE: Sorry, what am I supposed to put
14 up?

15 MR. SECORD: Exhibit 159.

16 MR. WIEBE: That would be the document
17 manager.

18 THE CHAIR: Document manager. I think,
19 Ms. Decosemo. Mr. Wiebe, we've got Ms. Decosemo muted,
20 so if she's not hearing the page number or something,
21 she can't get through. So if you could let her have
22 control of the mic, but Mr. Secord, I don't believe she
23 caught the page number, sorry, so once again, the
24 exhibit page number?

25 MR. SECORD: Yes, we've got to get the

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 exhibit up first, 159, Appendix G2, so PDF 376.

2 MR. WIEBE: Yeah, I didn't mute her, and so
3 she should be able to be receiving audio regardless.

4 THE CHAIR: Or -- she's able to speak up.
5 Maybe she didn't realize she can unmute.

6 MR. WIEBE: Yes, I can only mute their mic,
7 but I can't mute their audio coming in. And I sent her
8 a chat message, as well.

9 THE CHAIR: Thank you. It's -- apparently
10 it's up on her -- Ms. Vance is just checking with her.
11 Apparently it's up on her screen, so it's just not
12 sharing out for some reason. Just one quick second,
13 otherwise we'll continue, but we'll see if we can get
14 it rectified.

15 MR. WIEBE: Right now, it's Nora's screen
16 that's up there, and then just double click on the PDF.
17 (DISCUSSION OFF THE RECORD)

18 MR. SECORD: Should we take a five-minute
19 break?

20 THE CHAIR: Let's do that. We'll give you
21 your time, Mr. Secord.

22 MR. SECORD: Thank you. Appreciate it. Thank
23 you.

24 (BRIEF ADJOURNMENT)

25 THE CHAIR: As I said in the morning, we're

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 likely going to have one glitch or two, so we've done
2 pretty well.

3 Thanks everyone for some patience.

4 Mr. Secord, this is the correct exhibit and you're
5 at the right spot?

6 MR. SECORD: Yes, I'm at the right spot, and
7 I'm going to look at a number of these pages.

8 Q. So Mr. Hebert, I don't know whether you want to turn
9 this up, but what I'm going to do is I'm going to read
10 from exhibit -- and I don't want this turned up, but
11 I'm going to read from Exhibit 160 which is the PDR
12 change summary memo that was filed on December 18th,
13 2020. I'm sure you're familiar with it, and then I've
14 got some questions relating to Appendix G2 from
15 Exhibit 159, which is the final PDR.

16 And there's somebody in the background who's
17 making noise. So if people aren't, you know, talking,
18 if they could mute their mics, that would be useful.

19 So Mr. Hebert, reading from Exhibit 160 dealing
20 with the major changes to the project from the
21 preliminary PDR or the interim design report, there's
22 something entitled "Debris Deflective Barrier."

23 And the first bullet is the 2017 Interim Design
24 Report considered debris management, but did not
25 recommend construction of a structural system for

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 preventing debris from entering the diversion inlet.

2 And then it describes a 2020 final Preliminary
3 Design Report, 170-metre long debris deflection
4 barrier. And it would be normally in a dry condition,
5 et cetera, flood events?

6 And can you or somebody on your team confirm that
7 in Appendix G2 of Exhibit 159, PDF page 377 -- so if
8 the Zoom host can just, yeah, just go and put it --
9 PDF 377. Can you confirm that lines 148 to 155 capture
10 all of the costs of the debris deflection barrier?

11 **A. MR. HEBERT:** Mr. Chairman, I'd ask
12 Mr. Menninger to respond.

13 **A. MR. MENNINGER:** Yes, thank you, Mr. Hebert.
14 Mr. Chairman, the lines 148 through 155 cover the
15 direct construction cost for the debris deflection
16 barrier, not inclusive of contingency which is
17 incorporated at the end of the estimate.

18 **Q.** Were there any additional changes made to the debris
19 deflection barrier between the time of the December 3,
20 2019, revision to G2 and the filing of the 2020 final
21 Preliminary Design Report on December 18, 2020?

22 **A. MR. MENNINGER:** No.

23 **Q.** The following paragraph is from Exhibit 160, the PDR
24 change summary memo: (as read)

25 "Fish Passage Features, the 2017 Interim

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 Design Report did not address fish
2 passage as assessment of project effects
3 were on ongoing. The 2020 final
4 Preliminary Design Report adds a series
5 of three rock v-weirs" -- v-weirs --
6 "downstream of the service spillway, and
7 they are -- the v-weirs are lined with a
8 cobble apron as protection against
9 erosion and undermining. Reason for
10 change: Fish passage elements were
11 added to mitigate for potential project
12 effects and facilitate movement of fish
13 through the surface spillway."

14 Turning to page PDF 376 of Exhibit 159, can you confirm
15 that lines 102 to 105 capture all of the costs of the
16 fish passage features?

17 **A. MR. MENNINGER:** I would -- yes, between that and
18 the bank armoury and riprap revetment that are adjacent
19 to it, my apologies, something in my throat, yes.

20 **Q.** And were there any changes made to the fish passage
21 features between the time of the December 3, 2019,
22 revision to G-2 and the filing of the 2020 final PDR on
23 December 18, 2020?

24 **A. MR. MENNINGER:** So I believe it just is a general,
25 Mr. Secord, that the -- this document you have pulled

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 up, the cost estimate, did not change between
2 December -- between December of 2019 and December 2020.
3 In fact, I believe the date on this actually at the top
4 of the -- of the exhibit lists the cost opinion as
5 dated the 2019 date.

6 So there are no changes.

7 Q. The following passage is from Exhibit 160, the PDR
8 change summary memo, diversion channel, it says:
9 (as read)

10 "The 2017 Interim Design Report, the
11 interim design includes side slopes on
12 the diversion channel at 4H to 1V.
13 Riprap provides mitigation for scour at
14 critical embankment segments only. The
15 2020 final Preliminary Design Report
16 provides the side slopes to 3H to 1V in
17 soil at 2H to 1V in rock. In certain
18 sections, 5-metre-wide benches included
19 at the soil bedrock interface.
20 Additional riprap protection was added
21 to the channel bottom for sections
22 excavated through soil."

23 Can you please confirm that Exhibit G-2, lines 165 to
24 183 of Exhibit 159, PDF page 378, capture all of the
25 costs of the diversion channel changes referred to in

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 the paragraph above.

2 A. MR. MENNINGER: Could you repeat the line numbers
3 again?

4 Q. I have 165 to 183.

5 A. MR. MENNINGER: I think -- I'm referencing this --
6 they would also include 185 to -- if you continue to
7 scroll down, please, to 189. So yeah, 165 to 189.

8 Q. And which line items were changed for the 2017 interim
9 design report?

10 A. MR. MENNINGER: Sure. I mean --

11 Q. Or maybe how much was the change might be a better way
12 of putting it?

13 A. MR. MENNINGER: Sure. So ultimately, the change
14 in the side slopes did not -- did not result in a
15 significant change in the project costs as the channel
16 itself is the source for the primary -- for the soils
17 for the construction of the dam.

18 So the change in this channel side slopes that
19 went from flatter to a little bit steeper, they did
20 reduce a little bit of our hauling costs from the
21 channel to the dam, but not very appreciably.

22 The -- the primary change in cost was the addition
23 of the additional riprap. That was made as a -- an
24 addition risk mitigation feature to prevent erosion
25 within the channel.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 And so primarily what you would see the difference
2 is in lines 176 to 183 and the provision of additional
3 riprap within the channel to protect against scour and
4 erosion.

5 Q. Were there any further changes made to the diversion
6 channel between the time of the December 3, 2019,
7 revision to G-2 and the filing of the 2020 FPDR on
8 December 18, 2020?

9 A. No.

10 Q. The following paragraph is from Exhibit 160, the PDR
11 change summary memo, off-stream storage down
12 embankment, the 2017 Interim Design Report: (as read)

13 "The interim design dam embankment
14 includes a typical section with
15 3.5H:1.0V sides slopes for the
16 5-metre-wide horizontal benches located
17 every 10 vertical metres. A
18 32-metre-wide 6.5-metre tall rock toe
19 buttress was included at the upstream
20 toe for taller segments of the dam. The
21 2020 final Preliminary Design Report
22 revises the typical dam cross-section
23 with 3.5H:1.0V side slopes with
24 10-metre-wide horizontal benches located
25 every 10 vertical metres. A

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 6-metre-tall rock toe with a 10-metre
2 top width is added to improve stability
3 where foundation soils are deepest."

4 And it says: (as read)

5 "Reason for change: Design adjustments
6 to the dam cross-section reflect
7 additional soils testing performed
8 during the second geotechnical
9 exploration program and additional
10 analyses performed at the time for the
11 time rate of construction condition" --
12 sorry -- "for the time rate of
13 construction condition."

14 What is that, the time rate of construction condition?

15 **A. MR. MENNINGER:** **Sure. So during construction when**
16 **you're building a large embankment, you -- when you add**
17 **soil, you increase the load on the foundation. So by**
18 **"load," that mean the weight of the embankment on the**
19 **underlying soils. And so there's water inside those**
20 **underlying soils.**

21 So if you add weight to it, it compresses it down
22 kind of like a sponge, but the water can't get up fast
23 enough, and so you build up some pressure in those
24 underlying soils.

25 So the time rate of construction condition that

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 we're evaluating is depending on how quickly you
2 construct the dam, those pressures and the foundation
3 could increase.

4 So one of the key components here for the project,
5 being a relatively tall embankment dam in the 30 metres
6 in some stretches, we -- you know, that's one of the
7 controlling conditions for the geometry of the dam and
8 will be something that we can monitor throughout
9 construction to make sure that the pressures don't
10 exceed the levels that we are, you know, that are
11 necessary for the analysis.

12 And so that's basically the high level we're
13 talking about.

14 Q. All right. Can you confirm that Appendix G-2, lines
15 201 to 212 of Exhibit 159 on PDF page 378 --

16 A. MR. MENNINGER: I think you went past it.

17 Q. Yeah, it should be just at the top of the page, lines
18 201 to 212. Can you confirm that --

19 A. MR. MENNINGER: That encompasses the primary
20 elements of what we're discussing. The incorporation
21 of the vertical toe drain may have slightly been
22 altered during that period too, but that under 217 to
23 221. But, generally speaking, yes, those items are
24 covered in 201 to 212.

25 Q. And they capture all -- they capture all of the costs

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 of the changes?

2 A. MR. MENNINGER: Yeah.

3 Q. And what was the -- what was the amount of the change?

4 A. MR. MENNINGER: So it's -- because of the change
5 in the balance of the channel to the dam and where
6 we're -- we were sourcing some of the borrowed
7 materials, it's difficult to pinpoint exactly what was
8 the result of the channel side slope changing versus
9 the dam.

10 Generally speaking, when we looked at this in
11 total, it was relatively small, within a million to
12 \$2 million change for this element of the project based
13 off of those components. Ultimately, the dam geometry
14 changed very little between the two, as you may note
15 with the descriptions, would basically increase the
16 bench slightly and reduce the rock toe slightly, rock
17 buttress out.

18 Q. Mr. Menninger, were there any further changes made to
19 the Austrian (phonetic) storage dam embankment between
20 the time of the December 3, 2019, revision to G-2 and
21 the filing of the 2020 --

22 A. MR. MENNINGER: No.

23 Q. -- final PDR on December 18, 2020?

24 A. MR. MENNINGER: No.

25 Q. And then the following paragraph is from Exhibit 160,

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 PDR Change Summary Memo, the low-level outlet works,
2 and it says in 2017: (as read)

3 "The interim design of the low-level
4 outlet works, or LLOW, is located within
5 the Unnamed Creek valley. The gate
6 control structure is integral with the
7 intake structure and utilizes a
8 submerged hydraulic operator for gate
9 operations."

10 It says: (as read)

11 "The 2020 final Preliminary Design
12 Report revises the location of the LLOW
13 approximately 200 metres southwest of
14 the interim design location. A separate
15 gate structure is included with two
16 in-line gates midway up the upstream
17 slope. Intake channels and discharge
18 channels were incorporated to connect
19 the Unnamed Creek to the LLOW. And the
20 reason for change the revised -- the
21 location was revised based on additional
22 geotechnical information to reduce
23 potential risk to the structure from the
24 variable foundation conditions within
25 the Unnamed Creek. The additional gate

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 structure was added with the request of
2 the future operator AEP to improve
3 maintenance and operations."

4 Can you confirm that Appendix G-2, lines 230 to 240 of
5 Exhibit 159 at PDF page 379 captures all of the costs of
6 the LLOW changes referred to in the Exhibit 160 that I
7 just read?

8 **A. MR. MENNINGER:** Not all of them. I would say that
9 **243 to 246**, as you can see there, the inlet and outlet
10 **drainage channels**, were a significant driver of those
11 **cost changes for the low-level outlet works**, change
12 **that we're discussing**, primarily because of its
13 **location and the upland area required the excavation**
14 **and lining of a discharge and exit channel not**
15 **previously required for its location.**

16 **Q.** So it would be 230 to 246?

17 **A. MR. MENNINGER:** That's correct.

18 **Q.** Would capture the changes?

19 **A. MR. MENNINGER:** Yes.

20 **Q.** And were there any further changes made to the
21 **low-level outlet works between the time of December 3,**
22 **2019, revision to G-2 that we're looking at and the**
23 **filing of the 2020 final preliminary design report on**
24 **December 18, 2020?**

25 **A. MR. MENNINGER:** No.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 Q. Okay. And then maybe, document manager, you could pull
2 up Exhibit 160. And if you could scroll down, it
3 says -- just stop right there, that's perfect, second
4 paragraph, and I'll read it to you, Mr. Menninger,
5 unless your eyesight is really good. It says, and I
6 quote: Mr. Hebert writes: (as read)

7 "Notable changes from the Interim Design
8 Report to the final Preliminary Design
9 Report PDR are summarized below. Some
10 of these changes were also identified in
11 the introduction to Alberta
12 Transportation's responses to Round 2,
13 natural Resources Conservation Board and
14 Alberta Environment and Parks
15 supplemental information requests filed
16 on June 23, 2020."

17 So my question is if the changes were only identified by
18 AT in June 2020, how could the changes have been costed
19 in the December 3, 2019, revision to Appendix G-2.

20 A. MR. MENNINGER: The cost developed in 2019 were
21 based off of the concept designs that were then put
22 forward as part of the preliminary design and provided
23 to our client for consideration and incorporation into
24 the project. They then had to be assessed for their
25 environmental effects and other components prior to

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 them being then incorporated into their responses in
2 the project approach for the regulatory process.

3 So natural iteration of design, followed by
4 environmental impact assessment, and then submission
5 for regulatory filing.

6 Q. And then document manager, if you can scroll up to PDF
7 page 375 of Exhibit 159, and if you can go to the top
8 of the page, if you could just put your cursor on the
9 down arrow, you'll see on PDF page 375, you've got
10 estimated costs 2017 CAD. And then if we could go to
11 the next page, page 378, sorry, 376, we're going down,
12 other way. There we go. So there's -- whoa, whoa,
13 whoa.

14 So page 376, so page 375 estimated cost is CAD
15 2017, and then each of pages 377, 378, 379, 380, all of
16 them are estimated costs 2017 CAD. Can you tell me,
17 why are all the costs estimated in 2017 Canadian
18 dollars?

19 A. **MR. MENNINGER:** As a point of reference to
20 identify changes in the project, as well as for the
21 uses comparison in the benefit cost analysis and other
22 components.

23 Q. And so what are these -- what are the costs in 2020
24 Canadian dollars at the time of the filing of the final
25 Preliminary Design Report?

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 A. We did not update the costs assumed in 2020 dollars as
2 part of this cost opinion. Items may have gone up,
3 items may have gone down, depending on the market
4 conditions and other components in the area.

5 So that is part that will be -- that will be
6 developed as we -- as the project moves forward prior
7 to tender, but it was not part of this Preliminary
8 Design Report.

9 Q. Would it be possible to provide me with the total
10 project cost opinion in 2020 Canadian dollars?

11 A. MR. MENNINGER: It would not, no. We do not
12 have...

13 Q. Why is that? It's not a case of just putting it --
14 asking the computer to spit out a cost opinion in 2020
15 Canadian dollars; you can't do that?

16 A. MR. MENNINGER: You could, depending on what rate
17 of inflation and other elements you use. But that
18 wouldn't necessarily reflect the actual construction
19 costs at the time for the market rates and those
20 elements that are required. It's not a straight
21 time-value-money component that we're looking at here.

22 Q. So I'm sorry, I'm not an accountant, and -- so I'm
23 looking at this total cost opinion in 2017 Canadian
24 dollars, and I'm asking myself as a taxpayer, what is
25 this project costing the Alberta taxpayer as of the

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 time of the filing of the final Preliminary Design
2 Report? And what you've done here is you've given us a
3 cost of the project, in terms of what it would cost to
4 build in 2017?

5 **A. MR. MENNINGER:** As a baseline, that's what this
6 reflects, that's correct. At the time that those
7 original unit rates were developed for the costing to
8 the project.

9 **Q.** And so sitting here today, we don't know what this --
10 well, we don't know what -- we don't know what SR1 is
11 going to cost in -- assuming that this -- assuming the
12 Board issues a recommendation, you get an approval at
13 the end of the year; I think I looked at your
14 timelines. Your tenders are going out; in the summer,
15 I believe, you're sending tenders out. But at this
16 point, I take it we don't know what this project is
17 actually going to cost the taxpayer or the government?

18 **A. MR. HEBERT:** So Mr. Chairman, as I referenced
19 this morning, SR1 is a project under active
20 development. There is the cost opinion report that was
21 provided was the exhibit in front of us now. Certainly
22 this estimate guides Alberta Transportation in its
23 project planning, and it forms its ability to continue
24 to advance the project.

25 But ultimately, the known costs as it relates to

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 the construction component are subject to a competitive
2 tendering process that, as you referenced, sir, would
3 occur at a point later -- later this year.

4 Q. Have you got the tenders ready to go?

5 A. MR. HEBERT: Ms. Carignan is responsible for
6 the contracting on the project, she can provide a
7 response.

8 A. MS. CARIGNAN: Yes, Mr. Chairman, we are
9 currently finalizing all of the designs and working on
10 the tender package in the construction contract, but it
11 is not ready to go at this point in time.

12 Q. When will the tender documentation be complete,
13 Ms. Carignan?

14 A. MS. CARIGNAN: We anticipate that it'll be
15 complete late June, early July.

16 Q. And does that fit with the timeline that you set out in
17 the final Preliminary Design Report?

18 A. MS. CARIGNAN: That does.

19 Q. All right. So now I have a few questions, a few
20 questions on cost -- the cost-benefit analysis, look
21 like more than a few questions.

22 So on avoided damages, do you believe that MC1 and
23 SR1 have equal avoided damages of 27.7 million,
24 excluding the 180,000 for Bragg Creek and Redwood
25 Meadows?

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 **A. MR. HEBERT:** **Mr. Sol will respond.**

2 **A. MR. SOL:** **Yes, that would be the annualized**
3 **value for downstream from Glenmore Reservoir to the**
4 **confluence.**

5 **Q.** In terms of conclusions on avoided damages, Springbank
6 and Elbow Valley will receive better flood protection
7 with MC1 than SR1; true or false, Mr. Sol?

8 **A. MR. SOL:** **Sorry, can you reframe that?**

9 **Q.** Springbank and Elbow Valley will receive better flood
10 protection with MC1 than SR1; true or false?

11 **A. MR. SOL:** **Are you -- you're referring to**
12 **downstream of SR1 or upstream?**

13 **Q.** Yes.

14 **A. MR. SOL:** **Downstream, I believe you guys**
15 **just had that conversation; we haven't modelled the**
16 **flood damages.**

17 **Q.** So would I be correct, then, in saying that the
18 benefits for MC1 are higher, in terms of avoided annual
19 benefits for those --

20 **A. MR. SOL:** **Marginally, yes, as we**
21 **demonstrated with Bragg Creek and Redwood Meadows, 180**
22 **versus the 27.7 million that you referred to.**

23 **Q.** How about this proposition: Discovery Ridge will
24 receive better flood protection with MC1 than SR1; true
25 or false?

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 **A. MR. SOL:** **I believe that to be false if we**
2 **determined that there wasn't a flood risk there**
3 **post-SR1.**

4 **Q.** And did you determine that or are you just taking your
5 Panel's word for it that the Discovery Ridge --

6 **A. MR. SOL:** **It's from a review of the mapping.**

7 **Q.** So you do not believe that there is a flood risk at one
8 of the -- at the multistory facility?

9 **A. MR. SOL:** **Under which event are you**
10 **referring to?**

11 **Q.** Under --

12 **A. MR. SOL:** **Like there's residual flood risk**
13 **in all of these areas.**

14 **Q.** So --

15 **A. MR. SOL:** **Under the design event, I do not**
16 **believe there would be flood damages.**

17 **Q.** So you say there won't be flood damages in --

18 **A. MR. SOL:** **I do not -- I do not believe it is**
19 **a design flood.**

20 **Q.** So the design flood being a 1 in 50 flood -- a 1 in
21 50-year flood --

22 **A. MR. SOL:** **The 1 in 200-year flood.**

23 **Q.** Right, but the 1 in 200-year flood becomes a 1 in
24 50-year flood downstream of SR1; correct?

25 **A. MR. SOL:** **From my understanding of your**

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 earlier questions, yes.

2 Q. And you're saying that -- that just -- that there will
3 be no flood risk at Discovery Ridge in a 1 in 50-year
4 event?

5 A. MR. SOL: Just a moment, please. Thanks for
6 your patience. Please continue.

7 Q. Okay, another proposition. Bragg Creek -- in terms of
8 conclusion on avoided damages, Bragg Creek and Redwood
9 Meadows will receive better protection with MC1 than
10 SR1 up to a 1 in 1,000-year flood; therefore, the
11 benefits are higher with MC1 than SR1 for these
12 communities as well. Do you agree with that?

13 A. MR. SOL: In the absence of any other
14 mitigation, that would be reflected in the \$180,000
15 annually that we've presented.

16 Q. Okay, in terms of cost repairs post-flood, has the
17 proponent considered the cost of repairs to berms at
18 Bragg Creek and Redwood Meadows that will occur as a
19 result of the design flood, and would you agree that
20 those costs should be attributed to SR1?

21 A. MR. SOL: Are you referring to the proposed
22 berms that will be constructed?

23 Q. Correct. Well, I'm just referring -- yes, so the cost
24 of repairs to the berms at Bragg Creek and
25 Redwood Meadows, would you agree that that should be a

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 cost attributable to SR1?

2 A. MR. SOL: I can't speculate on the new
3 berms, why they would be damaged.

4 Q. Well, you understand that the berms are built to 1 in
5 100-year standard and the design flood is a 1 in
6 200-year. You understand that, Mr. Sol?

7 A. MR. SOL: Yes, it's also my understanding
8 that it was mentioned that there was some freeboard in
9 that that would accommodate a 2013, which is the
10 designed --

11 Q. That's your understanding?

12 A. MR. SOL: Yeah.

13 Q. So you're saying, then, that there would be no cost of
14 repairs to the berms at Bragg Creek as a result of the
15 design flood?

16 A. MR. SOL: No, I'm not saying that.

17 A. MR. HEBERT: Mr. Chairman, if I can interject.

18 These are separate projects from the SR1 project,
19 again, appreciating that they're part of a system of
20 flood mitigation projects on the Elbow River, but
21 specific costs related to repairs of those projects
22 would be borne by the entities responsible for those
23 projects.

24 Q. Okay, so that actually, Mr. Hebert, that's useful,
25 because I was going to ask who will pay to repair them.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 So that would be -- that would be Rocky View County?

2 **A. MR. HEBERT:** Yes, Mr. Chairman. Rocky View
3 County is accountable for the berming -- the flood
4 mitigation berming infrastructure at Bragg Creek.

5 **Q.** What about at Redwood Meadows, who would be responsible
6 to repair those berms?

7 **A. MR. HEBERT:** Mr. Chairman, you'll have to
8 forgive me. I know that the Redwood Meadows berms sit
9 on Tsuut'ina lands; however, it's part of a village of
10 Redwood Meadows.

11 Either way, Mr. Chairman, the entity responsible
12 for those berms would be responsible for their costs of
13 repair or operation.

14 **Q.** Has the proponent considered the cost of repairs to
15 parking lots, pathways, and other public infrastructure
16 along Highway 66 as a cost of SR1? These were replaced
17 following the 2013 flood, and that these areas will be
18 subjected to unmitigated flooding because of the choice
19 of SR1?

20 **A. MR. SOL:** Are you asking whether this was
21 included in the benefit cost analysis?

22 **Q.** Yes. Yes, Mr. Sol.

23 **A. MR. SOL:** No, it was not. The benefits...

24 **Q.** Why was that?

25 **A. MR. SOL:** The benefits of McLean Creek were

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 added to that project.

2 Q. But given that -- given that parking lots, pathways,
3 and other public infrastructure along Highway 66 were
4 replaced following the 2013 flood and will be subjected
5 to unmitigated flooding because of the choice of SR1,
6 why would the cost of repairs to these items not be
7 shown as a cost of SR1?

8 A. MR. HEBERT: Mr. Chairman, in the same way that
9 the cost for repair for other projects would be borne
10 by the operator responsible, in the way same, it would
11 apply to the infrastructure that's being referred to.
12 Some of it is public infrastructure. If it's
13 government of Alberta infrastructure, the government of
14 Alberta would have responsibility for those costs,
15 depending on the department that owns or operates the
16 infrastructure at the given time.

17 Q. Does AT know what the cost will be to build berms
18 across Springbank through Elbow Valley given that they
19 are not protected from flow rates sent down the river
20 by SR1?

21 A. MR. HEBERT: Mr. Chairman, as referred to in
22 the afternoon's proceedings, the responsibility for
23 local flood mitigation if it's needed is borne by the
24 municipality in question.

25 Q. Was this considered when considering SR1 over MC1?

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 **A. MR. SPELLER:** Mr. Secord, could you repeat that,
2 please? I lost the sound a little bit anyway.

3 **Q.** Was this considered when choosing SR1 over MC1 in 2015?

4 **A. MR. SPELLER:** Sorry, I should have been more
5 clear. I wanted you to clarify that this -- was this
6 considered, just briefly.

7 **Q.** What is the cost to build berms across Springbank
8 through Elbow Valley given that they are not protected
9 from flow rates sent down the river by SR1? Who is
10 going to pay for these berms? I think the answer is
11 Rocky View. And the question then is was this
12 considered when choosing SR1 over MC1 in 2015?

13 **A. MR. SPELLER:** So my understanding is -- there's
14 two pieces I guess. My first understanding is that
15 there's no such berms.

16 **Q.** Who's speaking -- who's speaking?

17 **A. MR. SPELLER:** I apologize. It's Wayne Speller.

18 **Q.** I don't see anybody on the screen. There we go.

19 **A. MR. SPELLER:** I'm trying to keep a low profile.
20 There's two pieces: One is that we're not aware of any
21 berms in that area being proposed at the moment. Like
22 Mr. Hebert said, if they were, it's the mandate of
23 Rocky View. But we're not aware even as of today of
24 there being any proposed, so they weren't considered
25 back in 2015.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 Q. The cost for erosion protecting the Unnamed Creek is
2 listed as 4.276 million with riprap of 16,250 cubic
3 metres, and that is Table IR-1, this Exhibit 90, PDF
4 page 12. And this is more than is listed in the 2019
5 construction estimate in totality for the low-level
6 outlet work. So where is this cost and is it added to
7 the construction costs at Exhibit 169, Appendix G-2?

8 And the riprap, as far as I can see, looks like --
9 the riprap currently is 15,331 cubic metres in G-2.
10 Can anybody shed some light on that for me?

11 A. MR. HEBERT: Mr. Chairman, Mr. Menninger is
12 likely able to answer that response.

13 A. MR. MENNINGER: Mr. Secord, can you repeat -- you
14 said the exhibit really quickly. My apologies. Can
15 you say that again? I missed that.

16 Q. So the note I have is the cost for erosion protecting
17 the unnamed creek is listed as 4.276 million with
18 riprap of 16,200 cubic metres, and this is more than is
19 listed in the 2019 construction estimate in totality
20 for the low-level outlet work. So where is this cost,
21 and is it added to the construction costs in
22 Exhibit 159, Appendix G-2.

23 A. MR. HEBERT: Mr. Secord, I think Mr. Menninger
24 was asking you -- you referred to costs I think in IR
25 response. We're just trying to get what document

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 you're referring to. You're saying costs are different
2 between two documents. What's the first document?

3 Q. Exhibit 90, PDF page 12.

4 A. MR. HEBERT: 90? 9-0?

5 Q. 90.

6 THE CHAIR: Maybe just while we're scrolling
7 there, Mr. Secord, we had planned on ending at 5. I
8 did mention and indicate that we probably stole a
9 little time from you because of those technical
10 difficulties.

11 MR. SECORD: Yeah, it's gone very fast,
12 Mr. Chair, my questioning. Let me just -- while
13 they're looking, I think Mr. Menninger's found the
14 4.276 million, let me just scroll down my -- I was
15 really hoping to get done in four hours. I thought --

16 THE CHAIR: Well, I guess I was going to
17 propose if you think you can complete it by quarter
18 after or 5:30 and if there's -- the Panel and others
19 are willing to sit till 5:30 and if you can complete,
20 then we can do that. If you just don't think that's
21 going to be possible, I guess you may need -- you need
22 to decide how much time is a Panel kind of willing to
23 commit that kind of time, and then we'd need to do that
24 probably tomorrow morning.

25 MR. SECORD: Yeah, yeah. I would -- maybe we

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 can see if we can get Mr. Menninger to answer that
2 question, and then maybe we could take -- let's see
3 what time it is. It's quarter -- 4:40. It's almost 5.

4 THE CHAIR: 10 to 5, yeah.

5 MR. SECORD: Maybe what I could do, if it's
6 agreeable, is we could take maybe -- give the court
7 reporter a brief break, and then I can take a quick
8 look, and then I can let you know, but I think there's
9 a good chance I could be done by 5:30. That would put
10 us back on schedule.

11 THE CHAIR: And Mr. Kruhlak, Fitch and Panel,
12 is -- if we need to go to 5:30, if we complete the
13 cross by SCLG, is that agreeable?

14 UNIDENTIFIED SPEAKER: Yes, that's fine.

15 THE CHAIR: Okay, good. So you get the
16 answer, and then you wanted a quick break to review
17 your questions, do I have that right?

18 MR. SECORD: Well, sure, I'm going to -- if I
19 can have a quick break, then that would be great, and
20 we can come back in 5 minutes, would be perfect.

21 THE CHAIR: They're ready to answer your
22 question, unless you want to answer that just before
23 break. Is the Panel ready? Let's get the answer then
24 if you're ready, and then a break.

25 A. MR. MENNINGER: My apologies, I must confess. I

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 wasn't familiar with this IR response in full.

2 But this -- the reference costs here are in
3 reference to a hypothetical channel to convey flows
4 that ultimately was not part of a design mitigation.

5 So the -- that ultimately did not end up in the
6 design of the project, Mr. Secord, so it is not a
7 comparison.

8 Q. MR. SECORD: That was helpful. Thank you
9 Mr. Menninger.

10 A. MR. MENNINGER: You're welcome.

11 MR. SECORD: So, Mr. Chair, if it's okay, can
12 we come back at 4:55?

13 THE CHAIR: Sounds good. 4:55, folks.

14 MR. FITCH: So, Mr. Chair, it's Mr. Fitch.
15 Just before we go, we have responses to a couple of
16 undertakings. They weren't numbered, but we've got
17 them which we can answer at some point before the end
18 of the day, whenever is convenient for the board.

19 THE CHAIR: Okay, great. Thank you,
20 Mr. Fitch. We'll listen when we get back from break,
21 then. Perfect, thank you.

22 (ADJOURNMENT)

23 THE CHAIR: Mr. Secord, I think Mr. Fitch was
24 ready to answer a couple undertakings.

25 MR. SECORD: Oh, yes, yeah. He's cutting into

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 my time again.

2 THE CHAIR: Well, he's answering your
3 questions, I think.

4 Mr. Fitch? Or whoever on the panel was going to
5 answer.

6 A. MR. SPELLER: It's Wayne Speller, Mr. Chairman,
7 I can start. So between lunch and the afternoon break,
8 we had two items.

9 The first was a question about the distance
10 between the Bragg Creek and the MC1 site, and roughly,
11 depending on how you measure it, it's approximately
12 10 kilometres.

13 Q. MR. SECORD: Is that as the crow flies?

14 A. MR. SPELLER: Yeah, maybe a bit of an awkward
15 crow, but, yeah, it's -- it's anywhere between 7 to
16 11 kilometres, depending on how we measure it.

17 Q. So that's between where and where?

18 A. MR. SPELLER: Between Bragg Creek and MC1 one.

19 Q. So somewhere between 7 and 11 kilometres?

20 A. MR. SPELLER: Yes.

21 Q. Depending whether you're flying or travelling by river
22 or road.

23 A. MR. SPELLER: Yes. Or following the river
24 itself, yeah, rather than a straight line, yeah, so...

25 Q. Okay.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 A. MR. SPELLER: And then the --

2 Q. Thank you for that.

3 A. MR. SPELLER: And the second item was related
4 to, we were discussing rainfall volumes, the table, and
5 Mr. Secord had asked a question about how much
6 infiltration there would be for that rainfall, and
7 Mr. Menninger is able to respond that.

8 A. MR. MENNINGER: Yeah, by our estimates, about
9 70 percent of the rainfall resulted in swell within the
10 river, if that makes sense.

11 Q. And --

12 A. MR. MENNINGER: That's based on --

13 Q. -- over what period of time? Over what period of time?

14 A. MR. MENNINGER: That was over that three day
15 period. So I was just giving you the total -- the
16 total volume associated with that over a seven-day
17 period. We had that seven-day period of measurement --

18 Q. So --

19 A. MR. MENNINGER: Sorry?

20 Q. You said a three-day period?

21 A. MR. MENNINGER: The majority of the rainfall fell
22 over a three-day period, but that total volume was
23 calculated over a seven-day period. So, yeah, rainfall
24 fell in three days --

25 Q. And what three days? And what three days were those?

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 **A. MR. MENNINGER:** June 19th to the 22nd of 2013.

2 **Q.** I was in Calgary when it was raining on June 19th, I
3 remember it well, so.

4 So, those three days, and so you're saying three
5 days of rain, and then it took seven days for the
6 rain -- for 70 percent of the rain that fell to find
7 its way into the river?

8 **A. MR. MENNINGER:** Yeah, give or take. Sorry, that's
9 right.

10 **Q.** And who does that type of analysis? What type of
11 expert does that?

12 **A. MR. MENNINGER:** Sure. So we had a meteorologist
13 that developed the rain on grid. Basically, a time
14 series of every hour the depth of rain that occurred
15 over the basin in, I believe, 1 square kilometre grids
16 across the whole basin, so they calibrated that radar
17 grid to that.

18 And then we had hydrologists and civil engineers
19 that specialize in water resources develop a model that
20 simulated that run off, and we compared that to the
21 gauge.

22 So we basically did a -- we took the rainfall, we
23 compiled it to a physically based numerical or computer
24 model and compared that against the measured data at
25 Glenmore. And so, basically, we're able to take

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 rainfall, simulate what it does on the environment,
2 compare it to the measured flows going into Glenmore,
3 so that's what that estimate's based off of.

4 Q. And in terms of the ground, I'm assuming you have to
5 model the ground surface in some fashion in terms of
6 whether it's a parking lot, whether it's a field,
7 whether it's a forest --

8 A. MR. MENNINGER: That's correct. Rocky --

9 Q. -- model?

10 A. MR. MENNINGER: Very much so. Rock outcrops and
11 things like that in the mountains contribute the most.
12 You would see upwards of 85 percent or greater runoff
13 in the mountains. As you proceed closer to Calgary in
14 kind of the flatter areas in the Foothills, in
15 agricultural areas, you had a lot less runoff.

16 But yeah, generally speaking, you had that kind of
17 mixed -- in the areas that kind of transition from rock
18 to gravelly, you would actually see a -- we simulated
19 where water would fall onto the rock surface,
20 infiltrate down, and return back to the river as kind
21 of filtering through that rock material. So, yeah.

22 Q. And do you know how the model -- how did the -- how is
23 the model calibrated in terms of the surface of the
24 land in the Elbow River catchment area? How is that
25 done?

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 **A. MR. MENNINGER:** Sure. So we had the measurement
2 at Glenmore, and then we did have information at the
3 gauge at Bragg --

4 **Q.** I thought -- sorry, I'm talking about the land, surface
5 of the land --

6 **A. MR. MENNINGER:** You can only measure it at known
7 values. So we -- we did our best approximation, and
8 based on the literature value and other elements, and
9 remote sensing data to understand how the -- the
10 watershed is comprised of different components and
11 elements, and then we checked it at known locations.
12 So at the gauges, at the streams.

13 And every given square kilometre, we can't tell
14 you for a hundred percent certain that that's going to
15 perform in that way, but we can say that overall the
16 model assumptions made produced a reasonable result, so
17 that's we used.

18 **Q.** Just going back to my question, Mr. Menninger, on the
19 cost of erosion for protection of the Unnamed Creek, we
20 had thought that most of it was going to be riprap. Is
21 that the current design?

22 **A. MR. MENNINGER:** It is not, no.

23 **Q.** So will any of the -- in terms of the low-level outlet
24 works, is there going to be any riprap protection --

25 **A. MR. MENNINGER:** Oh, yes.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 Q. -- for the low-level outlet?

2 A. MR. MENNINGER: Yeah, and that was what that --
3 those sections of the cost opinion show. We had a
4 channel, it's called the exit channel from the
5 low-level outlet works, and so it's -- I don't have the
6 length in front of me at the moment. But it's a
7 considerable length from the outlet works channel till
8 it discharges into the Unnamed Creek where it is
9 riprap.

10 And so, yes, it's controlled for a significant
11 distance downstream to prevent any potential damages to
12 the structure on the dam. Yeah.

13 Q. And that is -- is that 15,331 cubic metres of riprap
14 currently? Is that all for the Unnamed Creek?

15 A. MR. MENNINGER: That's -- for the intake and exit
16 channels, for the -- inclusive of the intake and exit
17 channels, implicit of the intake and exit channels for
18 the low-level outlet works.

19 Q. Okay. Thank you --

20 A. MR. MENNINGER: So have to be really close to that
21 other estimate.

22 Q. If we could turn to the emergency spillway in terms of
23 the benefit cost analysis, the emergency spillway is
24 "under design."

25 So do you mean to say that the design document

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 submitted on December 18, 2020, Exhibit 159, did not
2 include design of the emergency spillway?

3 A. MR. MENNINGER: We advanced it to the best -- the
4 best of knowledge we had. We advanced it to a fairly
5 far degree, but we couldn't be certain as to the final
6 configuration until we performed geotechnical locations
7 at that location to confirm the assumptions for the
8 design. Because that's where it stood at the time when
9 that was developed and at the time when we submitted
10 the final Preliminary Design Report.

11 Q. So what is the cost of the emergency spillway given
12 that it will be a constructed channel?

13 A. So that is -- it shows up in the diversion channel
14 segment of the cost estimate because that's where it
15 falls spatially. It shows up, lines 158 to 163 within
16 the Preliminary Design Report.

17 So, roughly speaking, if I'm adding this up, it's
18 about \$8 million -- no. Yes -- 7, a little lower than
19 7, actually, yeah.

20 And you're right, that does not include -- the
21 excavation for that channel is actually aggregated into
22 the diversion channel excavation. We calculate
23 excavation all as a whole, so we didn't break that out
24 separately for the EMS.

25 Generally speaking, excavation for this job is

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 almost free because it goes into the dam; otherwise,
2 we'd have to use bar.

3 Q. AET has said that the design of the emergency spillway
4 is underway, the need for erosion protection is part of
5 the design and will be reviewed by the AEP dam safety
6 as part of Alberta Transportation *Water Act*
7 application.

8 Does the erosion protection run the full channel
9 to the river?

10 A. MR. MENNINGER: It does not currently. That
11 was -- I think that response sounds like what one of
12 our responses to the -- perhaps the Austin Engineering
13 report.

14 The -- what we're talking about there is, you
15 know, similar to McLean Creek, that has an unlined soil
16 or earthen spillway, there emergency spillway for SR 1
17 does as well. Erosion of that spillway is possible
18 during activation, and so what you look at there is
19 survivability in an event and make sure that it can
20 pass it without harming the impacts of the structure.

21 So, at this time, you know, we have a nominal --
22 we extend and in the design for the Preliminary Design
23 Report, we extended the exit -- riprap lining
24 downstream of the concrete structure for a portion of
25 the channel, and then it transitions to a soil or

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 rock/soil discharge channel.

2 Q. What is the channel with depth for the emergency
3 spillway?

4 A. MR. MENNINGER: It varies, but -- so near the
5 structure, it's about 180 metres in width and by its --
6 or 160 metres in width and by its terminus, it's about
7 200 metres wide.

8 Water depth, if it were ever to activate, and if
9 it were to activate in the ultimate worst-case scenario
10 as modeled, it could have a depth of about a metre of
11 flow in it, but that's not anticipated, but it could.
12 So that's what we're designing for.

13 Q. And so is it fair to say that there are a number of
14 costs here that are not part of Exhibit 159, Appendix
15 G-2, that we looked at earlier?

16 A. MR. MENNINGER: The costs are -- was our best
17 assessment at the time of what we anticipate the
18 emergency spillway to cost and ultimately be.

19 I have no -- you know, we are -- that's currently
20 under development and review, but at this time, going
21 at that development, it was, and continues to be our
22 base assumption.

23 Q. In terms of road costs, where is the cost of upgrading
24 Range Road 440 to a county connector, is it still
25 planned? And the reference would be Exhibit 129,

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 page 8.

2 A. MR. SPELLER: Mr. Chairman, we're just pulling
3 up that reference in just a minute.

4 Q. And also while we are on it on the same page, where is
5 the cost for Township Road 250 updates to add a
6 left-hand turn lane? Where is that in -- in the
7 costing?

8 A. MR. HEBERT: One moment, Mr. Chair.

9 MS. CARIGNAN: Mr. Chairman, I can address those
10 questions. It's Yvonne Carignan. I think I'm getting
11 feedback through someone else's mic; it's gone.

12 Currently neither Range Road 40 or Township
13 Road 250 are going to have additional upgrades made to
14 them. They were removed from the project sometime ago
15 due to cost.

16 Q. And why was that?

17 A. MS. CARIGNAN: I don't understand your question,
18 Mr. Secord.

19 Q. Why was it removed because of cost, what are you
20 saying; it was too expensive or --

21 A. MS. CARIGNAN: My understanding is that the --
22 the costs of the project were all being evaluated, and
23 pieces were being considered that could be removed.
24 And other pieces were being evaluated that needed to be
25 added.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 Q. So Ms. Carignan, my understanding is that with respect
2 to Township Road 250, these are apparently community
3 detour roads. So why would they be removed because of
4 cost?

5 A. MS. CARIGNAN: They can still be utilized as they
6 are in their current state. The proposed changes were
7 upgrades to them.

8 Q. Right. And do you know what type of road Range Road 40
9 is, Ms. Carignan?

10 A. MS. CARIGNAN: I would have to go back and check;
11 I can't remember offhand.

12 Q. Would it be a gravel road?

13 A. MS. CARIGNAN: Like I said, I can't confirm. I
14 can go back and check.

15 Q. Would you undertake to confirm that it is a gravel
16 road?

17 A. MS. CARIGNAN: Yes, I can.

18 Q. MR. SECORD: And --

19 A. MR. HEBERT: Sorry to interrupt, Mr. Secord.
20 Mr. Svenson can provide an answer to your question.

21 A. MR. SVENSON: I apologize, I had to get my mask
22 off.

23 Q. And Mr. Svenson, just for a little bit of -- just a
24 little bit of background in relation to Township
25 Road 250, my understanding is that there's some

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 question of the safety of that particular township
2 road. So anyway, please proceed.

3 **A. MR. SVENSON:** To your question about Range
4 **Road 40, yes, it is a gravel road.**

5 **Q.** And do you have any information on why the cost for
6 upgrades of Range Road 440 and Township Road 250, why
7 they were -- why they were not -- why they were removed
8 from the budget?

9 **A. MR. SVENSON:** No, I have nothing to add to
10 **Ms. Carignan's response.**

11 **Q.** A question on pipelines, we do not see any pipeline
12 cost estimates which have remained steady for five
13 years. Are there more recent pipeline relocation
14 costs, and if not, why not?

15 **A. MS. CARIGNAN:** The pipeline costs have not been
16 updated because we are currently in negotiations with
17 all the pipeline companies signing agreements for them
18 to undertake their engineering studies.

19 **Q.** And in terms of the process for the removal of
20 pipelines, at the end of the day, will the pipeline
21 companies be submitting a bill to Alberta
22 Transportation for the payment of these engineering
23 studies and for the actual removal and replacement of
24 the pipelines?

25 **A. MS. CARIGNAN:** It's not so much that they will

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 submit a bill at the end of the day; it's that the
2 costs are agreed upon in the advance, and we enter into
3 contractual agreements with those pipeline companies to
4 reimburse their costs.

5 Q. So the first -- so what you're saying is the first
6 stage, then, is they will do some engineering studies
7 to determine where the pipeline goes?

8 A. MS. CARIGNAN: Yes, yes, that is -- that would
9 be -- that's accurate in a simple form, yes.

10 Q. And in relation to these pipelines, I'm assuming for
11 the most part, they would be on private land?

12 A. MS. CARIGNAN: For the most part, yes; however,
13 the majority of the pipelines actually have
14 right-of-ways and right-of-way agreements for them, and
15 they're contained within their existing right-of-way.

16 Q. Well, I've dealt with a lot of pipelines in my time
17 practicing law, and typically pipeline right-of-ways
18 are not that -- are not that wide.

19 So I'm assuming some of the -- will these
20 companies have to acquire new right-of-ways for these
21 pipeline relocations? I mean I'm assuming you're not
22 moving the pipelines over 5 feet or 10 feet, are you,
23 Ms. Carignan?

24 A. MS. CARIGNAN: It's not that we're moving them
25 over. Only one pipeline actually requires a

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 relocation; the other pipelines, they're being buried
2 deeper under the new proposed diversion canal. And
3 they're being -- they're staying in their existing
4 right-of-way. They may require some temporary work
5 space.

6 Q. So -- so in relation to that, it is the case, then, of
7 simply excavating existing right-of-way deeper, perhaps
8 within the right-of-way itself and then moving the
9 pipeline over; is that the idea? Or will they be
10 taking out the existing pipe and putting new pipe into
11 the deeper trench; do you know how this is going to
12 turn out?

13 A. MS. CARIGNAN: Yes, they will be directionally
14 drilling the new pipelines, and once those new
15 pipelines are tied into the existing pipeline on each
16 end, they will remove the existing pipeline through the
17 diversion channel.

18 Q. Will they remove it or will they just leave it in the
19 ground?

20 A. MS. CARIGNAN: No, they cannot just leave it in
21 the ground. They need to obtain reclamation
22 certificates for any of that decommissioning work on
23 that existing pipeline.

24 Q. Is it sounds expensive?

25 A. MS. CARIGNAN: Perhaps.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 Q. Okay. And then you say with one pipeline, it's a total
2 relocation in the sense of acquiring new right-of-way
3 and presumably having to go to the Alberta Energy and
4 Utility Commission or the Alberta Energy Regulator to
5 get an approval or -- yeah, I guess an approval to
6 construct a new line; is that correct?

7 A. MS. CARIGNAN: That is correct. It's important
8 to note that no pipeline companies will be approaching
9 the Alberta Energy Regulator unless the project is
10 approved.

11 Q. Right. So at this point, the only thing that's
12 happening is your -- they're studying how to do this
13 directional drilling; correct?

14 A. MS. CARIGNAN: They are undertaking their
15 engineering, it wouldn't be how to. They are designing
16 their pipeline and determining what the costs
17 associated with it will be.

18 Q. And do I understand that the entire pipeline, the
19 actual relocation of these pipelines within the
20 existing right-of-ways, the entire length through the
21 reservoir will be directionally drilled?

22 A. MS. CARIGNAN: That is not accurate. There is
23 only one pipeline current -- well, pardon me, there's
24 only one pipeline company currently located within the
25 reservoir. All of the other pipelines within the

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 project footprint are located along the diversion
2 canal, predominantly within the south-west corner of
3 Township Road 242 and Highway 22.

4 Q. And so does AT have a budget for the pipeline
5 relocation costs at this point in time?

6 A. MS. CARIGNAN: The pipeline relocation costs have
7 been accounted for in the overall project budget, and
8 they have been identified in Stantec's cost as opinion.

9 Q. And what is that cost at the present time?

10 A. MS. CARIGNAN: Just give me a moment and I'll
11 pull it up.

12 So if you look at Stantec's cost opinion, lines
13 266 through 272, 272 is the subtotal for the major
14 utilities. So for strictly pipelines as we're
15 discussing here, we're looking at \$12,443,750 is what's
16 in the cost opinion.

17 Q. Those are 2017 dollars?

18 A. MS. CARIGNAN: That would be correct.

19 Q. And you have no -- no cost in 2020 dollars --

20 A. MR. CARIGNAN: I have --

21 Q. -- to provide the Panel?

22 A. MS. CARIGNAN: I have not received a cost
23 estimate from any of the pipeline companies yet with
24 respect to what they anticipate their relocates to
25 cost.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 Q. And have you asked for that?

2 A. **MS. CARIGNAN:** Yes, they're working on it in
3 their engineering studies right now.

4 Q. And when do you expect to be in receipt of that
5 information?

6 A. **MS. CARIGNAN:** It varies from pipeline company to
7 pipeline company. I believe the earliest one is around
8 mid to late May that we'll be receiving those costs,
9 but that would need to be confirmed.

10 Q. And I understand some of the utilities that have to be
11 moved would be distribution lines, transmission lines
12 of some sort?

13 A. **MS. CARIGNAN:** Yes, that's correct. That's in
14 the shallow utility relocation costs identified
15 directly above the pipeline costs in the cost opinion.

16 Q. And are these transmission lines or distribution lines
17 that are being moved?

18 A. **MS. CARIGNAN:** You know what, I am not an expert
19 in that field. I'm -- I'm not clear on the
20 terminology.

21 Q. So we're sitting here now in what, is it 2021, yeah,
22 2021, March, and you've been working on this for --
23 well, it's four years since 2017. And you're saying
24 basically there's no new information that you can give
25 us in relation to these pipeline costs?

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 A. MS. CARIGNAN: Mr. Chairman, agreements have only
2 been entered into with pipeline companies specifically
3 in about the last year and maybe -- perhaps a year and
4 a half, but I would have to go back and confirm.

5 Q. Okay, question on embankment riprap. Given that the
6 SCLG experts and SIA recommend that the embankment be
7 riprapped on the water side, what is the cost of this
8 requirement?

9 A. MR. MENNINGER: We have not done a cost estimate
10 to determine what it would cost to riprap the face of
11 the embankment. As -- you know, as indicated in our
12 responses, those -- and I should say I don't believe
13 that SIA's suggestion was to riprap the full embankment
14 when you reference the origin of their recommendation.
15 It was a -- we tried to correct the reference point.
16 But irregardless -- irregardless, we don't recommend
17 it, we don't recommend it.

18 The riprap is often used in dams on the face where
19 the water level is consistent on the embankment for a
20 long period of time. This is because, over time, wave
21 wash, over long periods of time, can initiate erosion
22 and then you can end up with some exposure of the
23 underlying soils and failure of the vegetative cover.

24 In the case of SR1, you know, with the limited
25 pool and the inconsistent depth of water, we don't

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 anticipate the development of the conditions where you
2 would have a consistent wave attack at any given one
3 location on the embankment. And more so to the point,
4 we evaluated the effectiveness of the vegetative cover
5 and the given embankment -- proposed embankment
6 materials and they are -- based on our calculations,
7 can withstand wave attack for a reasonable period of
8 time.

9 Q. And what is a reasonable period of time, Mr. Menninger?

10 A. MR. MENNINGER: So, you know, as indicated in our
11 filings, you know, it takes about 40 days to lower the
12 reservoir of the -- to a nominal pool.

13 And during that time, we felt a recurrence
14 interval of a, I believe it was a one and two-year
15 wind -- straight line of wind-driven wave would be
16 appropriate, given that the water level's constantly
17 dropping. That seemed to be a reasonable assumption
18 for the design.

19 Q. What is a 1 in 2-year level wave?

20 A. MR. MENNINGER: I'm sorry. So you look at wind
21 speeds with a recurrence interval given a certain time
22 period. So you look at different -- it's an estimation
23 technique. Similarly like the different depth --
24 different dam guidelines for freeboard generate wave
25 requirements or wind. Basically you look at wind

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 setup, how fast the wind would set up and then drive
2 waves. So you look at the depth of the wave.

3 Q. What does a 1 in 2-year level wave mean in layman's
4 terms, for those of us who --

5 A. **MR. MENNINGER:** Sure. It means.

6 Q. -- are unconversant.

7 A. **MR. MENNINGER:** It means that it would be the --
8 the strongest wind that you would expect to occur once
9 every two years or more, I think I believe is what the
10 generally -- I mean the sustained winds, I should say.

11 Q. Do they get -- do they get much sustained wind in the
12 Springbank area --

13 A. **MR. MENNINGER:** Oh, certainly.

14 Q. -- west of Calgary?

15 A. **MR. MENNINGER:** Yeah. And those estimates are
16 based off of the location in the -- in fact the airport
17 there.

18 Q. And what has Stantec found in terms of the highest
19 level of sustained winds in the Springbank area?

20 A. **MR. MENNINGER:** I can't quote the direct numbers
21 off of you -- for you on this element, but I mean we
22 did evaluate them for both the freeboard for the dam,
23 for the much larger recurrence intervals to make sure
24 that we had the appropriate freeboard.

25 In this particular case, we're looking at a very

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 short period of time where you would have those winds
2 attacking the same location.

3 So you gotta remember the water level's constantly
4 dropping as we're lowering it, so the winds, wherever
5 they're approaching, will be only focused for a very
6 nominal period of time.

7 THE CHAIR: Mr. Secord, if I may, it is 5:30.

8 You were hoping to wrap up and --

9 MR. SECORD: I ask --

10 THE CHAIR: -- I think the section you're
11 trying to get a benefit cost analysis. I'm not quite
12 connecting the odds on the wind questions and the wave
13 issue. There's probably a time for that, but I'm not
14 sure how it -- and it may relate to benefit cost
15 analysis, I may just be missing that, but did you have
16 other BCA questions that you were hoping to get to
17 today?

18 MR. SECORD: I did have some land cost
19 estimates that I wanted to ask, but I might be able to,
20 I think -- I don't know -- looking at the Panel, I
21 think I may be able to ask those in the land use
22 section perhaps, but I see here that -- I was hoping to
23 do a little better, Mr. Chair, I really was, but I do
24 have -- I see I've got -- it looks to me like I've got
25 seven questions left. So -- and it is late. So either

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 I -- I ask them in my 90-minutes allocation on Topic
2 block 2 or -- and we can end now, but I think I don't
3 want to keep everybody. It's been a -- I think it's
4 been a long day already, so. I'm in your hands,
5 Mr. Chair.

6 THE CHAIR: Yeah, I think -- you know, I think
7 you're right. I mean, those are -- I mean, yes,
8 they're cost questions, but they are related to land
9 use as well. Why don't we do that, break for the
10 evening, and we'll start off tomorrow morning with
11 Calalta then, and I appreciate you holding those other
12 questions for land use.

13 Just a couple things maybe before we break for the
14 night.

15 So tomorrow, as indicated earlier, we would start
16 at 8:30 so that means a 7:45 start for sign-on time
17 starting tomorrow morning.

18 And we did have one other undertaking -- I think
19 we have one undertaking that has not been sort of
20 charted and that dealt with consultation.

21 So, Mr. Secord, do you recall the exact
22 question -- I did not write it down, but the question
23 that went to the Panel on consultation?

24 MR. SECORD: You know, Mr. Chair, I don't, and
25 I'll have to look at the transcript. If I could, I

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 just have one wrap-up on that embankment riprap. I
2 hadn't quite finished that.

3 THE CHAIR: I'm, sorry, go ahead.

4 MR. SECORD: Mr. Menninger, you know, got off
5 on a sidetrack about wave action. So I just wanted to
6 revisit that.

7 Q. So in relation to, you know, our experts recommending
8 that the embankment be riprapped on the water side, in
9 terms of the total area, would you accept that, subject
10 to check, that it is 330,000 cubic metres, which would
11 be a 30-metre height at 3.1H:V for 3.7 kilometres, and
12 assuming every square metre of surface area is a cubic
13 metre of riprap, would you agree that the cost of the
14 riprapping of the bank would be -- embankment would be
15 in the order of \$55 million? Would that be a fair
16 estimate, Mr. Menninger?

17 A. MR. MENNINGER: I -- I was trying to follow along
18 your numbers there, Mr. Secord. The dam is not
19 30 metres at full length; it's only 30 metres for a
20 very short segment. Its average height is probably
21 half of that. A metre thick would be awful thick for
22 what you're talking through, in terms of what you would
23 require for this wave component. And we wouldn't take
24 it to the top of the dam either because it's -- you
25 know, water's not going to get up to that height.

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 So I mean, I don't know what those volumes are
2 off -- what those volumes would be, but I suspect that
3 they would be below the number that you put.

4 A. MR. HEBERT: Mr. Chairman, I would just note
5 that it was -- this is an item that was referenced in
6 IAAC draft environmental assessment report. We've
7 provided a response suggesting a correction to that
8 element. So I think that information would benefit the
9 Panel if that wasn't made clear earlier.

10 MR. SECORD: All right. Thank you, Mr. Chair,
11 for letting me wrap up that one loose end. Thank you.

12 THE CHAIR: Thank you, Mr. Secord.

13 So 7:45 sign-in time, and then we'll wait for the
14 transcripts, and then we'll get that undertaking for
15 tomorrow, and then we'll start tracking them. We'll do
16 a little better job tracking them.

17 I think today, folks, went pretty well considering
18 we -- we did have a couple glitches on document
19 management, but really, overall, document management
20 was brought up, I thought, pretty quickly. Panel was
21 respectful on caucus. And Mr. Secord and others, nice
22 job on keeping to time.

23 So let's break for tonight, and start off with
24 Calalta tomorrow morning.

25 One thing that I would ask Mr. Secord, you're not

ALBERTA TRANSPORTATION TOPIC #1 PANEL

Cross-examined by Mr. Secord

1 up right away, but your mic didn't really get any
2 better during the time. It wasn't terrible, but if you
3 can kind of do a sound check on it, it would be great
4 because you're going to be up again and for some
5 extended time, so it would be most helpful.

6 MR. SECORD: I'll look into that. Thank you,
7 sir.

8 MR. WIEBE: I could offer a quick suggestion
9 too, because I'm the technical guy here.

10 If you have a plug-in mic or if you have
11 headphones that have a mic in them.

12 MR. SECORD: Yes.

13 MR. WIEBE: That can also help as well.

14 MR. SECORD: This is supposed to have a mic in
15 it so...

16 MR. WIEBE: You know what, the computer might
17 be configured to use the mic that's in the front of the
18 screen. Are you on a laptop by chance?

19 MR. SECORD: Yes.

20 MR. WIEBE: Yeah, I thought so. So I think
21 it's using the mic that's at the top of the screen
22 versus in your headphones. So maybe try to figure that
23 out tonight.

24 MR. SECORD: Thank you.

25 MR. WIEBE: Yeah, no problem.

1 MR. FITCH: Mr. Chair, it's Gavin Fitch.

2 According to our understanding of the schedule, Calalta
3 actually doesn't have any cross-examination of this
4 Panel, which would just leave I think Mr. Wagner
5 estimated potentially 15 or 25 minutes, and then we
6 would just go to NRCB staff and the Panel.

7 THE CHAIR: Yeah, I was going to confirm
8 actually Mr. Williams was on the phone before we left
9 and confirm with him. But you may have just done that.
10 Mr. Williams, are you on line right now or Mr. -- yeah,
11 Mr. Williams? Doesn't appear to be so.

12 Okay, and if that's right, Mr. Fitch, then we'll
13 move on with Mr. Wagner and then the board staff and
14 Panel questions, so tomorrow morning. Thank you.

15 MR. FITCH: Thank you.

16 THE CHAIR: Much appreciated, Mr. Fitch.
17 Thank you everyone, and have a goodnight. We'll see
18 you bright and early tomorrow morning. Thank you,
19 Mr. Wiebe, for IT support from MNP.

20 MR. WIEBE: No problem.

21

22 PROCEEDINGS ADJOURNED TO 8:30 A.M., MARCH 23, 2021

23

24

25

1 Certificate of Transcript

2

3 We, the undersigned, hereby certify that the foregoing
4 pages 122 to 270 are a complete and accurate transcript of
5 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 22, 2021.

10

"Lorelee Vespa"

11

Lorelee Vespa, CSR(A) CRR RPR
12 Official Court Reporter

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"Deanna M. DiPaolo"

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Deanna M. DiPaolo, CSR(A)
17 Official Court Reporter

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- I N D E X -

VOLUME 1 - AFTERNOON SESSION

1		
2		
3		
4		
5		
6	<u>M. HEBERT, M. SVENSON, W. SPELLER, D. BRESCIA, M.</u>	124
7	<u>WOOD, D. SOL, J. MENNINGER, Y. CARIGNAN, M. SMITH,</u>	
8	<u>M. PERRET</u> (For Alberta Transportation)	
9		
10	MR. SECORD CROSS-EXAMINES THE PANEL	124
11		
12		
13		
14		

UNDERTAKINGS GIVEN

15		
16		
17	UNDERTAKING - TO PROVIDE THE DATES WHEN THE	212
18	CONSULTATIONS WERE HELD THAT DEALT WITH THIS	
19	AUGUST 23RD, 2017, DOCUMENT	
20		
21		
22		
23		
24		
25		

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

\$	1,500 [1] - 135:15	249:13	2,600 [6] - 131:10, 133:2, 133:3, 134:5, 134:10	212:19, 212:24, 213:9, 213:11, 213:14, 217:23, 218:25, 220:10, 221:8, 222:12, 226:2, 229:10, 229:15, 229:16, 229:17, 230:23, 231:4, 259:17, 260:23, 271:19
\$10 [1] - 186:18	1,984 [2] - 134:22, 144:1	150 [1] - 196:5	2,770 [1] - 132:13	
\$12,443,750 [1] - 259:15	1-in-a-million-year [1] - 173:15	155 [2] - 218:9, 218:14	2-year [2] - 262:19, 263:3	
\$180,000 [1] - 235:14	1.5 [2] - 200:18, 200:19	158 [1] - 250:15	2.6 [1] - 158:23	
\$55 [1] - 266:15	1/500th [1] - 173:5	159 [14] - 129:10, 215:9, 215:15, 216:1, 217:15, 218:7, 219:14, 220:24, 224:15, 227:5, 229:7, 240:22, 250:1, 252:14	2.8 [2] - 200:19, 200:20	
0	10 [9] - 128:9, 163:22, 170:9, 170:17, 222:17, 222:25, 242:4, 244:12, 256:22	16,200 [1] - 240:18	20 [1] - 129:10	
001 [1] - 165:3	10,000 [2] - 142:23, 142:25	16,250 [1] - 240:2	20-year [1] - 132:6	2018 [3] - 129:5, 186:17, 211:2
1	10,000M [1] - 154:23	160 [12] - 157:22, 157:25, 208:2, 217:11, 217:19, 218:23, 220:7, 222:10, 225:25, 227:6, 228:2, 252:6	200 [6] - 139:24, 153:13, 178:10, 178:13, 226:13, 252:7	2019 [12] - 210:22, 218:20, 219:21, 220:2, 220:5, 222:6, 225:20, 227:22, 228:19, 228:20, 240:4, 240:19
1 [76] - 122:19, 123:4, 125:5, 134:20, 136:1, 136:11, 136:12, 136:14, 136:20, 136:21, 136:23, 136:25, 137:11, 137:20, 138:19, 139:17, 139:24, 139:25, 141:4, 141:13, 141:16, 142:13, 142:14, 143:8, 143:9, 143:25, 144:7, 144:13, 144:19, 144:25, 145:1, 145:12, 147:8, 147:20, 149:6, 150:2, 153:8, 153:13, 165:1, 165:2, 171:23, 172:1, 173:2, 173:4, 178:9, 178:10, 178:12, 178:13, 178:15, 179:18, 180:19, 189:1, 191:2, 191:4, 207:9, 207:12, 208:21, 209:11, 211:3, 234:20, 234:22, 234:23, 235:3, 235:10, 236:4, 236:5, 246:15, 251:16, 262:19, 263:3, 271:3	10-metre [1] - 223:1	162,000 [1] - 240:18	200-metre-wide [1] - 173:22	2020 [28] - 129:10, 160:5, 186:19, 217:13, 218:2, 218:20, 218:21, 219:3, 219:22, 219:23, 220:2, 220:15, 222:7, 222:8, 222:21, 225:21, 225:23, 226:11, 227:23, 227:24, 228:16, 228:18, 229:23, 230:1, 230:10, 230:14, 250:1, 259:19
1,000-year [13] - 132:6, 136:11, 136:13, 136:15, 136:25, 137:11, 137:20, 138:20, 146:23, 179:18, 180:19, 191:2, 236:5	10-metre-wide [1] - 222:24	163 [1] - 250:15	200-year [13] - 141:15, 142:13, 143:8, 147:8, 147:20, 149:6, 149:18, 150:2, 171:23, 173:4, 234:22, 234:23, 236:6	202,000 [1] - 167:10
100 [3] - 145:1, 178:13, 178:15	100 [3] - 145:1, 178:13, 178:15	165 [3] - 220:23, 221:4, 221:7	200-year [13] - 141:15, 142:13, 143:8, 147:8, 147:20, 149:6, 149:18, 150:2, 171:23, 173:4, 234:22, 234:23, 236:6	2020 [28] - 129:10, 160:5, 186:19, 217:13, 218:2, 218:20, 218:21, 219:3, 219:22, 219:23, 220:2, 220:15, 222:7, 222:8, 222:21, 225:21, 225:23, 226:11, 227:23, 227:24, 228:16, 228:18, 229:23, 230:1, 230:10, 230:14, 250:1, 259:19
100,000 [1] - 165:2	100,000 [1] - 165:2	165 [3] - 220:23, 221:4, 221:7	2005 [1] - 138:17	2021 [6] - 122:20, 123:5, 260:21, 260:22, 269:22, 270:9
100-year [13] - 132:6, 136:11, 136:13, 136:15, 136:25, 137:11, 137:20, 138:20, 146:23, 179:18, 180:19, 191:2, 236:5	1000-year [13] - 132:6, 136:11, 136:13, 136:15, 136:25, 137:11, 137:20, 138:20, 146:23, 179:18, 180:19, 191:2, 236:5	169 [2] - 186:19, 240:7	2007 [1] - 200:13	2050 [2] - 200:21, 202:22
1000-year [1] - 134:20	101 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	170 [5] - 143:2, 149:23, 154:16, 154:25, 183:12	201 [3] - 224:15, 224:18, 224:24	2100 [2] - 164:17, 164:23
101 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1010-year [1] - 134:20	170,000 [1] - 167:10	2013 [42] - 130:19, 132:6, 136:4, 148:11, 148:16, 149:5, 149:18, 149:21, 150:20, 157:14, 158:2, 163:14, 163:20, 165:18, 167:8, 168:8, 168:11, 169:17, 169:21, 171:14, 173:4, 173:6, 175:6, 176:21, 176:25, 177:23, 179:5, 180:18, 182:1, 190:12, 190:22, 197:23, 197:25, 198:9, 207:12, 210:18, 213:3, 236:9, 237:17, 238:4, 246:1	2112 [13] - 138:11, 138:23, 139:16, 157:13, 165:10, 165:21, 167:17, 167:22, 181:19, 224:15, 224:18, 224:24, 271:17
1010-year [1] - 134:20	101 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	170-metre [1] - 218:3	2014 [3] - 179:2, 200:11, 201:15	2121 [1] - 224:23
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1701 [1] - 122:7	2015 [8] - 161:21, 185:18, 186:7, 188:12, 213:8, 239:3, 239:12, 239:25	22nd [2] - 167:7, 246:1
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	176 [1] - 222:2	2017 [28] - 204:18, 210:21, 211:10, 211:12, 211:21, 211:22, 212:17,	23 [2] - 228:16, 269:22
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	18 [7] - 129:5, 218:21, 219:23, 222:8, 225:23, 227:24, 250:1		230 [2] - 227:4, 227:16
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	180 [2] - 233:21, 252:5		234 [2] - 146:9, 146:10
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	180,000 [1] - 232:24		23rd [2] - 212:16, 212:19
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	183 [3] - 220:24, 221:4, 222:2		23RD [2] - 212:24,
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	185 [1] - 221:6		
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	189 [2] - 221:7		
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	18th [1] - 217:12		
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1908 [1] - 175:17		
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1984 [2] - 135:7, 136:9		
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	19th [3] - 167:7, 246:1, 246:2		
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1C [1] - 166:10		
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1V [3] - 220:12, 220:16, 220:17		
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	2		
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	2 [12] - 127:13, 127:18, 127:19, 127:21, 139:4, 140:20, 178:21, 194:2, 196:14, 225:12, 228:12, 265:2		
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	2,000 [1] - 182:7		
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	2,170 [1] - 132:23		
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21			
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21			
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21			
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21			
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21			
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21			
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21			
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21			
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21			
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21			
1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21	1011 [10] - 136:24, 153:2, 161:25, 162:3, 182:9, 194:3, 196:15, 204:18, 206:5, 210:21			
1011 [10] - 136:24, 153:2, 161:25,				

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

271:19 240 [1] - 227:4 242 [1] - 259:3 243 [1] - 227:9 246 [2] - 227:9, 227:16 25 [9] - 130:24, 169:18, 170:17, 170:20, 171:4, 187:9, 199:22, 199:25, 269:5 250 [5] - 253:5, 253:13, 254:2, 254:25, 255:6 251 [1] - 194:2 2517 [3] - 166:12, 166:24, 167:2 252 [9] - 178:1, 178:18, 185:15, 185:25, 186:2, 186:3, 187:25, 196:13, 213:3 258 [2] - 146:2, 146:6 2600 [1] - 164:22 265 [2] - 156:19, 156:20 266 [1] - 259:13 27 [1] - 131:6 27.7 [2] - 232:23, 233:22 270 [1] - 270:4 272 [2] - 259:13 2770 [1] - 164:19 2H [1] - 220:17	35,000 [1] - 205:16 37 [1] - 151:10 375 [3] - 229:7, 229:9, 229:14 376 [4] - 216:1, 219:14, 229:11, 229:14 377 [3] - 218:7, 218:9, 229:15 378 [4] - 220:24, 224:15, 229:11, 229:15 379 [2] - 227:5, 229:15 380 [1] - 229:15 3H [1] - 220:16	242:12, 264:7	8	184:19 according [2] - 190:10, 269:2 account [1] - 182:25 accountable [1] - 237:3 accountant [1] - 230:22 accounted [1] - 259:7 accounts [1] - 175:13 accrue [1] - 149:25 accumulates [1] - 192:5 accumulation [2] - 163:23, 192:4 accumulations [1] - 170:13 accurate [8] - 137:9, 139:19, 139:22, 162:12, 176:1, 256:9, 258:22, 270:4 achieve [2] - 130:19, 153:15 achieved [1] - 130:21 achieving [1] - 155:1 acknowledge [4] - 145:21, 194:19, 197:21, 204:17 acknowledges [1] - 195:16 acquire [1] - 256:20 acquiring [1] - 258:2 acres [2] - 196:4, 196:5 acronyms [1] - 125:2 Act [1] - 251:6 action [1] - 266:5 Action [1] - 123:21 activate [2] - 252:8, 252:9 activation [1] - 251:18 active [4] - 128:8, 142:22, 154:23, 231:19 actual [6] - 163:7, 163:10, 175:18, 230:18, 255:23, 258:19 adapted [7] - 199:16, 199:17, 200:7, 204:7, 204:9, 204:15, 206:3 adapting [1] - 203:24 add [8] - 134:17, 167:13, 167:21, 184:17, 223:16, 223:21, 253:5, 255:9 added [15] - 130:24, 167:23, 170:8, 171:4, 186:16,
3	4	6	9	
3 [12] - 143:24, 143:25, 161:23, 166:10, 184:25, 185:6, 218:19, 219:21, 222:6, 225:20, 227:21, 228:19 3.1H:V [1] - 266:11 3.5H:1.0V [2] - 222:15, 222:23 3.7 [1] - 266:11 30 [3] - 224:5, 266:19 30,000 [2] - 164:12, 165:19 30-metre [1] - 266:11 32 [2] - 166:18 32,000 [5] - 166:17, 166:19, 166:20, 167:5, 167:11 32-metre-wide [1] - 222:18 325 [2] - 178:22, 207:6 330 [4] - 137:5, 137:9, 137:17, 138:3 330,000 [1] - 266:10	4 [5] - 146:15, 146:18, 161:22, 194:3, 199:14 4.276 [3] - 240:2, 240:17, 241:14 40 [5] - 151:14, 253:12, 254:8, 255:4, 262:11 41,000 [1] - 190:10 41,300 [1] - 190:11 43 [1] - 206:5 440 [2] - 252:24, 255:6 452 [1] - 199:14 46 [4] - 131:22, 153:3, 161:25, 162:4 480 [8] - 129:11, 130:17, 130:22, 130:25, 135:14, 135:20, 137:6, 171:2 4:40 [1] - 242:3 4:55 [2] - 243:12, 243:13 4H [1] - 220:12	6 [1] - 180:16 6-metre-tall [1] - 223:1 6.1 [2] - 132:3, 133:25 6.1.5 [1] - 131:22 6.5-metre [1] - 222:18 60 [2] - 149:19, 152:13 600 [18] - 129:6, 129:16, 130:15, 130:25, 131:2, 132:22, 134:12, 135:8, 135:18, 137:4, 137:8, 137:15, 140:23, 141:10, 145:8, 147:22, 157:21, 164:19 640 [8] - 140:24, 140:25, 141:11, 149:7, 165:13, 165:22, 207:11, 210:4 66 [2] - 237:16, 238:3	8 [4] - 153:1, 178:22, 250:18, 253:1 8.4 [2] - 201:5, 201:23 80 [1] - 158:5 83 [1] - 129:10 830 [6] - 135:1, 135:5, 144:17, 144:23, 182:9, 183:7 85 [1] - 247:12 8:30 [2] - 265:16, 269:22	9-0 [1] - 241:4 9.1 [5] - 167:6, 168:18, 168:20, 174:4, 174:6 9.5 [1] - 159:4 90 [4] - 240:3, 241:3, 241:4, 241:5 90-minutes [1] - 265:1 93,000 [4] - 162:11, 162:17, 164:5, 164:9 930 [4] - 136:25, 137:3, 137:16, 138:23
	5	7	A	
	5 [9] - 124:11, 156:19, 156:21, 156:22, 241:7, 242:3, 242:4, 242:20, 256:22 5-metre-wide [2] - 220:18, 222:16 50 [3] - 203:5, 207:9, 234:20 50-year [7] - 207:13, 208:22, 209:11, 209:20, 234:21, 234:24, 235:3 500 [1] - 173:5 500-year [1] - 172:1 55 [2] - 204:18, 205:8 5:30 [5] - 241:18, 241:19, 242:9,	7 [5] - 175:21, 244:15, 244:19, 250:18, 250:19 7,770 [1] - 152:9 70 [10] - 155:10, 155:18, 156:5, 156:7, 156:9, 164:3, 170:7, 170:15, 245:9, 246:6 70,000 [3] - 128:22, 158:8, 163:19 70,100 [1] - 128:23 70,100,000 [2] - 128:22, 128:23 70,210 [1] - 128:6 70,210,000 [2] - 128:5, 128:6 70-year [1] - 149:20 75 [2] - 145:1, 158:5 75-year [7] - 141:4, 141:13, 141:16, 142:14, 143:9, 144:19, 144:25 760 [1] - 157:23 77 [3] - 128:13, 164:4, 169:16 77,000 [6] - 162:23, 163:3, 163:16, 164:6, 164:9, 170:14 7:45 [2] - 265:16, 267:13 7th [2] - 148:1	A.M [1] - 269:22 abandon [1] - 203:2 abandoning [2] - 203:4, 203:6 ability [6] - 134:18, 190:21, 191:17, 205:5, 231:23, 270:7 able [14] - 132:13, 133:9, 134:19, 145:7, 153:24, 168:4, 215:2, 216:3, 216:4, 240:12, 245:7, 246:25, 264:19, 264:21 absence [1] - 235:13 absolutely [3] - 130:12, 144:4, 144:12 absorb [2] - 132:14, 132:17 absorbed [1] - 174:17 accept [5] - 184:9, 184:15, 184:16, 194:14, 266:9 access [1] - 178:3 accommodate [2] - 204:14, 236:9 accompanying [1] - 184:8 accordance [1] -	

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>187:17, 187:21, 219:11, 220:20, 223:2, 227:1, 238:1, 240:6, 240:21, 253:25</p> <p>adding [3] - 134:11, 187:8, 250:17</p> <p>addition [9] - 186:18, 187:11, 188:9, 193:3, 198:2, 200:2, 205:3, 221:22, 221:24</p> <p>additional [20] - 138:16, 147:17, 148:21, 163:21, 163:22, 164:12, 167:23, 170:9, 177:16, 192:21, 205:13, 218:18, 220:20, 221:23, 222:2, 223:7, 223:9, 226:21, 226:25, 253:13</p> <p>address [3] - 176:4, 219:1, 253:9</p> <p>adds [1] - 219:4</p> <p>adjacent [1] - 219:18</p> <p>ADJOURNED [1] - 269:22</p> <p>ADJOURNMENT [3] - 185:10, 216:24, 243:22</p> <p>adjournment [1] - 124:11</p> <p>adjustments [1] - 223:5</p> <p>admit [1] - 191:19</p> <p>advance [7] - 178:5, 182:17, 183:2, 188:5, 205:25, 231:24, 256:2</p> <p>advanced [5] - 182:15, 184:12, 188:9, 250:3, 250:4</p> <p>advancement [1] - 188:24</p> <p>advantage [1] - 177:15</p> <p>advantages [1] - 158:15</p> <p>advice [4] - 143:20, 204:22, 206:10, 212:21</p> <p>advise [2] - 142:12, 145:11</p> <p>advised [2] - 180:1, 208:19</p> <p>AEP [11] - 160:9, 160:11, 160:14, 186:8, 194:16,</p>	<p>196:14, 196:16, 213:2, 213:8, 227:2, 251:5</p> <p>AEP's [2] - 160:3, 196:24</p> <p>AET [1] - 251:3</p> <p>affected [1] - 146:23</p> <p>affects [1] - 196:20</p> <p>afternoon [3] - 124:17, 126:22, 244:7</p> <p>Afternoon [2] - 122:21, 123:4</p> <p>AFTERNOON [1] - 271:3</p> <p>afternoon's [1] - 238:22</p> <p>aggregated [1] - 250:21</p> <p>ago [3] - 143:15, 175:7, 253:14</p> <p>agree [32] - 138:24, 144:12, 144:15, 144:20, 150:23, 151:3, 151:12, 151:13, 151:19, 152:2, 152:8, 155:8, 155:11, 155:16, 155:19, 155:22, 160:9, 160:14, 172:10, 172:13, 175:3, 190:25, 194:10, 195:3, 196:24, 201:18, 202:22, 203:21, 235:12, 235:19, 235:25, 266:13</p> <p>agreeable [2] - 242:6, 242:13</p> <p>agreed [1] - 256:2</p> <p>agreement [1] - 148:17</p> <p>agreements [4] - 255:17, 256:3, 256:14, 261:1</p> <p>agricultural [1] - 247:15</p> <p>ahead [1] - 266:3</p> <p>Aid [6] - 127:12, 127:17, 127:18, 127:21, 136:20, 136:21</p> <p>aid [1] - 143:24</p> <p>aids [3] - 127:10, 127:16, 167:14</p> <p>aim [1] - 154:24</p> <p>airport [1] - 263:16</p> <p>al [1] - 200:13</p> <p>Alberta [59] - 123:2, 123:16, 124:22,</p>	<p>125:3, 135:24, 141:17, 142:12, 145:10, 145:20, 148:19, 150:3, 150:23, 151:3, 151:13, 151:19, 152:8, 161:20, 171:22, 172:7, 178:6, 179:3, 179:14, 181:22, 182:17, 184:11, 184:15, 185:16, 186:7, 186:8, 188:10, 189:20, 189:22, 190:2, 190:14, 190:22, 194:14, 195:1, 195:20, 196:14, 197:4, 197:6, 204:24, 206:6, 211:17, 212:5, 213:2, 228:11, 228:14, 230:25, 231:22, 238:13, 238:14, 251:6, 255:21, 258:3, 258:4, 258:9, 270:8, 271:8</p> <p>Albertans [2] - 196:21, 199:3</p> <p>Allen [2] - 197:22, 197:25</p> <p>allocated [1] - 142:24</p> <p>allocation [3] - 142:22, 215:1, 265:1</p> <p>allow [2] - 148:9, 170:11</p> <p>allowing [4] - 157:9, 157:15, 157:22, 157:25</p> <p>allows [3] - 155:8, 155:16, 162:7</p> <p>almost [2] - 242:3, 251:1</p> <p>alter [2] - 178:3, 194:8</p> <p>altered [1] - 224:22</p> <p>alternate [1] - 171:8</p> <p>alternatives [5] - 127:9, 198:3, 213:15, 213:21, 213:25</p> <p>AMEC [2] - 200:11, 201:15</p> <p>amend [1] - 140:8</p> <p>amount [9] - 148:13, 149:10, 158:12, 163:7, 163:9, 167:25, 192:6, 192:16, 225:3</p> <p>Amusements [1] -</p>	<p>124:3</p> <p>analyses [2] - 199:23, 223:10</p> <p>analysis [18] - 140:18, 148:10, 149:16, 154:19, 161:2, 161:9, 161:18, 161:19, 177:25, 215:8, 224:11, 229:21, 232:20, 237:21, 246:10, 249:23, 264:11, 264:15</p> <p>anecdotal [1] - 175:12</p> <p>annual [3] - 200:24, 203:23, 233:18</p> <p>annualized [1] - 233:2</p> <p>annually [1] - 235:15</p> <p>anonymous [3] - 190:4, 196:14, 213:2</p> <p>answer [31] - 140:8, 143:14, 148:9, 148:22, 150:13, 158:22, 159:2, 159:8, 159:9, 159:21, 175:9, 176:10, 182:25, 183:22, 192:12, 193:4, 193:24, 202:12, 212:4, 213:5, 239:10, 240:12, 242:1, 242:16, 242:21, 242:22, 242:23, 243:17, 243:24, 244:5, 254:20</p> <p>answering [2] - 129:24, 244:2</p> <p>anticipate [4] - 232:14, 252:17, 259:24, 262:1</p> <p>anticipated [1] - 252:11</p> <p>anyway [3] - 166:11, 239:2, 255:2</p> <p>apologies [9] - 125:20, 128:16, 140:9, 142:2, 184:3, 184:22, 219:19, 240:14, 242:25</p> <p>apologize [3] - 170:22, 239:17, 254:21</p> <p>apparent [1] - 211:20</p> <p>appear [2] - 185:18, 269:11</p> <p>appendix [1] - 166:11</p> <p>Appendix [12] - 146:4, 160:6, 215:9, 216:1, 217:14, 218:7,</p>	<p>224:14, 227:4, 228:19, 240:7, 240:22, 252:14</p> <p>Application [1] - 122:7</p> <p>application [3] - 152:23, 182:17, 251:7</p> <p>applied [1] - 163:7</p> <p>applies [1] - 206:18</p> <p>apply [2] - 206:22, 238:11</p> <p>appreciably [1] - 221:21</p> <p>appreciate [2] - 216:22, 265:11</p> <p>appreciated [1] - 269:16</p> <p>appreciates [1] - 199:1</p> <p>appreciating [1] - 236:19</p> <p>approach [4] - 206:8, 206:18, 207:2, 229:2</p> <p>approaching [2] - 258:8, 264:5</p> <p>appropriate [9] - 137:7, 143:17, 190:7, 195:2, 202:9, 207:24, 208:15, 262:16, 263:24</p> <p>appropriateness [1] - 143:22</p> <p>approval [4] - 206:15, 231:12, 258:5</p> <p>approved [1] - 258:10</p> <p>approximate [4] - 124:11, 158:21, 158:22, 159:1</p> <p>approximation [1] - 248:7</p> <p>apron [1] - 219:8</p> <p>aquifer [1] - 180:3</p> <p>area [34] - 138:14, 138:15, 138:17, 139:21, 139:22, 146:25, 148:6, 149:13, 151:21, 152:9, 158:17, 158:18, 159:17, 159:20, 163:24, 168:23, 170:12, 176:16, 178:4, 191:15, 196:18, 198:11, 198:14, 209:18, 209:20, 210:13, 227:13, 230:4, 239:21, 247:24, 263:12, 263:19, 266:9,</p>
--	--	---	---	---

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>266:12 areas [16] - 146:22, 147:5, 191:22, 194:23, 198:8, 199:3, 199:5, 199:6, 199:9, 199:10, 210:14, 234:13, 237:17, 247:14, 247:15, 247:17 armoury [1] - 219:18 arrive [2] - 191:25, 193:8 arrives [3] - 133:10, 164:21, 181:16 arriving [3] - 136:9, 191:24, 192:20 arrow [1] - 229:9 aside [1] - 198:13 aspects [2] - 192:14, 204:3 assembled [1] - 188:21 assertion [1] - 207:6 assess [1] - 199:23 assessed [3] - 200:13, 205:23, 228:24 assessment [8] - 206:5, 206:21, 213:16, 213:25, 219:2, 229:4, 252:17, 267:6 assign [1] - 214:7 associated [7] - 126:3, 160:10, 173:13, 205:19, 212:6, 245:16, 258:17 assume [1] - 186:14 assumed [3] - 173:25, 174:8, 230:1 assuming [8] - 147:23, 231:11, 247:4, 256:10, 256:19, 256:21, 266:12 assumption [2] - 252:22, 262:17 assumptions [2] - 248:16, 250:7 AT [13] - 125:3, 128:1, 128:18, 172:3, 180:1, 190:24, 197:21, 211:15, 211:19, 211:23, 228:18, 238:17, 259:4 ATs [2] - 125:5, 129:4 attack [2] - 262:2, 262:7 attacking [1] - 264:2</p>	<p>attributable [1] - 236:1 attributed [1] - 235:20 audio [5] - 130:1, 176:14, 215:5, 216:3, 216:7 augment [1] - 205:17 augmentation [1] - 205:20 August [2] - 212:16, 212:19 AUGUST [2] - 212:24, 271:19 Austin [1] - 251:12 Austrian [1] - 225:19 authored [1] - 189:16 authorities [1] - 190:7 authority [2] - 142:8, 207:22 automatic [1] - 207:1 auxiliary [3] - 133:6, 134:14, 173:23 available [6] - 154:23, 162:24, 164:2, 174:25, 175:10, 175:13 Avenue [1] - 148:1 average [2] - 201:5, 266:20 avoid [1] - 198:5 avoided [5] - 232:22, 232:23, 233:5, 233:18, 235:8 aware [14] - 143:13, 143:19, 145:17, 172:2, 172:3, 172:4, 190:22, 190:24, 208:23, 209:14, 211:9, 211:11, 239:20, 239:23 awful [1] - 266:21 awkward [1] - 244:14</p>	<p>bars [1] - 191:21 base [1] - 252:22 based [24] - 136:13, 137:11, 146:20, 153:10, 153:23, 160:16, 165:17, 168:5, 168:12, 168:18, 168:20, 168:22, 169:13, 170:16, 176:3, 225:12, 226:21, 228:21, 245:12, 246:23, 247:3, 248:8, 262:6, 263:16 baseline [1] - 231:5 basements [1] - 180:4 basic [1] - 149:4 Basin [2] - 200:16, 201:8 basin [3] - 130:20, 246:15, 246:16 basins [2] - 201:6, 201:24 basis [6] - 154:9, 154:21, 155:2, 160:18, 183:11, 183:16 BCA [1] - 264:16 bear [2] - 158:22, 159:7 bearing [1] - 181:23 bears [1] - 150:13 Bearspaw [1] - 152:12 beat [1] - 202:5 became [1] - 211:11 becomes [2] - 180:3, 234:23 bed [3] - 187:4, 192:16, 193:8 bedrock [1] - 220:19 beg [1] - 178:24 began [1] - 148:19 begin [3] - 124:10, 132:18, 148:8 beginning [1] - 126:16 belief [1] - 184:5 below [11] - 132:4, 133:24, 149:24, 153:25, 154:7, 154:16, 178:2, 191:21, 208:2, 228:9, 267:3 bench [1] - 225:16 benches [3] - 220:18, 222:16, 222:24 benefit [16] - 130:6, 148:11, 161:18, 161:19, 192:17, 195:4, 195:13, 198:20, 215:8,</p>	<p>229:21, 232:20, 237:21, 249:23, 264:11, 264:14, 267:8 benefits [11] - 125:24, 127:9, 182:4, 183:14, 183:18, 183:20, 206:21, 233:18, 233:19, 235:11, 237:25 benefits.. [1] - 237:23 berm [1] - 179:23 berming [6] - 179:8, 179:22, 182:1, 184:12, 237:3, 237:4 berms [31] - 177:13, 177:24, 178:1, 178:4, 178:8, 178:14, 180:2, 180:11, 180:15, 180:19, 182:10, 182:20, 183:6, 183:9, 190:12, 191:1, 193:21, 235:17, 235:22, 235:24, 236:3, 236:4, 236:14, 237:6, 237:8, 237:12, 238:17, 239:7, 239:10, 239:15, 239:21 best [13] - 132:21, 135:8, 140:22, 165:13, 169:12, 183:25, 188:3, 206:8, 248:7, 250:3, 250:4, 252:16, 270:6 better [10] - 167:21, 181:18, 221:11, 233:6, 233:9, 233:24, 235:9, 264:23, 267:16, 268:2 Between [1] - 136:22 between [37] - 137:10, 137:21, 138:14, 140:20, 141:2, 145:3, 150:5, 165:19, 165:20, 165:23, 167:11, 168:9, 169:2, 177:8, 178:5, 183:20, 191:13, 200:18, 207:6, 208:7, 218:19, 219:17, 219:21, 220:1, 220:2, 222:6, 225:14, 225:19, 227:21, 241:2, 244:7, 244:10,</p>	<p>244:15, 244:17, 244:18, 244:19 beyond [1] - 162:23 bigger [1] - 175:5 Bill [3] - 197:22, 197:25, 214:4 bill [2] - 255:21, 256:1 birds [2] - 195:5, 195:14 bit [23] - 124:16, 126:8, 156:24, 157:19, 157:23, 165:17, 166:11, 167:16, 190:18, 191:8, 202:15, 202:17, 202:18, 214:17, 214:18, 221:19, 221:20, 239:2, 244:14, 254:23, 254:24 block [2] - 125:5, 265:2 board [2] - 243:18, 269:13 BOARD [1] - 122:2 Board [5] - 123:1, 134:4, 138:14, 228:13, 231:12 Bob [1] - 124:3 borne [3] - 236:22, 238:9, 238:23 borrowed [1] - 225:6 bottom [4] - 127:22, 162:17, 177:25, 220:21 Boulevard [1] - 146:25 Bow [20] - 147:6, 147:11, 147:15, 147:20, 147:23, 147:24, 148:3, 148:12, 148:16, 149:5, 149:11, 149:18, 150:3, 150:7, 150:11, 152:9, 152:12, 175:4, 175:10, 207:4 Bowness [1] - 146:24 Bragg [39] - 139:8, 139:24, 140:11, 144:3, 155:5, 158:25, 159:5, 168:7, 168:13, 168:24, 177:13, 177:16, 177:21, 177:22, 178:15, 179:9, 181:17, 181:24, 182:10, 182:21, 183:6, 183:10, 184:12, 190:12, 191:2,</p>
	B			
	<p>background [2] - 217:16, 254:24 balance [1] - 225:5 bank [3] - 180:13, 219:18, 266:14 bar [1] - 251:2 Barbero [1] - 123:17 bare [1] - 164:3 Barrier [1] - 217:22 barrier [8] - 181:7, 187:17, 191:24, 192:1, 218:4, 218:10, 218:16, 218:19 barriers [1] - 181:5</p>			

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

191:13, 193:13, 193:20, 232:24, 233:21, 235:7, 235:8, 235:18, 235:24, 236:14, 237:4, 244:10, 244:18, 248:3 break [19] - 124:14, 159:10, 174:23, 174:25, 185:1, 185:2, 214:18, 216:19, 242:7, 242:16, 242:19, 242:23, 242:24, 243:20, 244:7, 250:23, 265:9, 265:13, 267:23 breakout [1] - 157:3 Brescia [2] - 159:2, 196:7 BRESCIA [3] - 124:20, 196:9, 271:6 bridge [1] - 171:19 Bridge [2] - 168:10, 168:14 Bridgeland [1] - 147:3 brief [2] - 125:2, 242:7 BRIEF [1] - 216:24 briefly [1] - 239:6 bright [1] - 269:18 broader [2] - 206:24 broadly [1] - 182:19 brought [2] - 179:7, 267:20 Bruni [1] - 123:21 budget [3] - 255:8, 259:4, 259:7 build [4] - 223:23, 231:4, 238:17, 239:7 building [1] - 223:16 buildings [1] - 210:5 built [8] - 145:15, 147:21, 149:7, 153:17, 172:11, 182:23, 210:7, 236:4 bull [2] - 195:22, 196:2 bullet [2] - 146:18, 217:23 buried [1] - 257:1 businesses [1] - 142:15 buttness [2] - 222:19, 225:17 bypass [2] - 155:9, 155:17	Calalta [5] - 124:3, 124:3, 265:11, 267:24, 269:2 calculate [1] - 250:22 calculated [1] - 245:23 calculations [2] - 173:25, 262:6 Calgary [48] - 123:2, 123:18, 123:20, 123:21, 136:3, 136:9, 141:6, 141:14, 141:18, 141:19, 141:21, 142:5, 142:7, 142:9, 143:11, 143:21, 145:6, 145:11, 145:12, 145:14, 147:2, 147:4, 147:5, 148:1, 148:13, 148:23, 150:17, 150:22, 151:5, 159:24, 159:25, 172:20, 179:22, 179:25, 208:2, 208:3, 208:14, 208:18, 209:8, 209:13, 209:14, 209:17, 211:25, 212:9, 246:2, 247:13, 263:14, 270:8 Calgary's [7] - 146:4, 150:24, 151:7, 151:15, 151:18, 152:14, 177:25 calibrated [3] - 168:5, 246:16, 247:23 campground [1] - 159:6 camping [1] - 198:8 Canada [1] - 172:9 Canadian [5] - 229:17, 229:24, 230:10, 230:15, 230:23 canal [2] - 257:2, 259:2 cannot [3] - 125:19, 133:23, 257:20 capability [2] - 205:21, 206:2 capable [1] - 154:14 capacity [26] - 128:4, 128:5, 128:9, 128:21, 129:15, 129:16, 130:16, 131:1, 131:2, 132:18, 133:16, 135:17, 156:10, 159:16, 159:19,	163:16, 163:21, 163:22, 164:10, 164:21, 169:16, 170:10, 171:4, 171:6, 171:9, 187:9 capture [8] - 156:5, 158:16, 218:9, 219:15, 220:24, 224:25, 227:18 captured [1] - 167:20 captures [2] - 158:5, 227:5 Carignan [7] - 211:20, 232:5, 232:13, 253:10, 254:1, 254:9, 256:23 CARIGNAN [33] - 124:21, 232:8, 232:14, 232:18, 253:9, 253:17, 253:21, 254:5, 254:10, 254:13, 254:17, 255:15, 255:25, 256:8, 256:12, 256:24, 257:13, 257:20, 257:25, 258:7, 258:14, 258:22, 259:6, 259:10, 259:18, 259:20, 259:22, 260:2, 260:6, 260:13, 260:18, 261:1, 271:7 Carignan's [1] - 255:10 Carina [1] - 123:13 case [27] - 132:18, 138:1, 140:5, 142:8, 143:21, 147:7, 160:20, 163:3, 163:22, 164:10, 165:4, 165:13, 172:22, 173:21, 184:1, 184:12, 193:20, 194:17, 198:24, 208:13, 230:13, 252:9, 257:6, 261:24, 263:25 catchment [2] - 158:17, 247:24 caucus [4] - 156:12, 161:13, 202:18, 267:21 caucusing [1] - 178:18 caught [1] - 215:23 causes [1] - 159:11 caution [1] - 206:18 cell [2] - 127:5, 162:17	Celsius [3] - 200:18, 200:19, 200:20 Ceroici [1] - 123:8 certain [11] - 125:17, 163:9, 180:12, 188:20, 192:6, 195:22, 197:1, 220:17, 248:14, 250:5, 262:21 certainly [15] - 125:8, 143:20, 175:11, 193:17, 193:20, 195:16, 197:9, 197:17, 199:6, 199:7, 199:12, 206:20, 207:23, 231:21, 263:13 Certificate [1] - 270:1 certificates [1] - 257:22 certify [1] - 270:3 cetera [3] - 178:4, 197:22, 218:5 CHAIR [59] - 124:9, 125:19, 125:25, 126:11, 126:19, 126:21, 127:23, 129:17, 129:20, 130:3, 141:25, 145:23, 146:6, 146:12, 146:16, 148:24, 153:6, 156:14, 156:20, 156:22, 157:5, 162:1, 162:7, 166:25, 175:1, 178:17, 184:21, 184:24, 185:6, 185:8, 185:11, 185:24, 186:2, 203:14, 213:4, 214:10, 215:4, 215:18, 216:4, 216:9, 216:20, 216:25, 241:6, 241:16, 242:4, 242:11, 242:15, 242:21, 243:13, 243:19, 243:23, 244:2, 264:7, 264:10, 265:6, 266:3, 267:12, 269:7, 269:16 Chair [15] - 123:7, 127:14, 137:13, 178:16, 180:25, 184:17, 185:23, 190:25, 198:10, 199:18, 200:9, 202:14, 253:8,	265:5, 267:10 chair [15] - 138:12, 138:25, 141:8, 142:2, 142:17, 149:15, 150:9, 202:4, 214:24, 241:12, 243:11, 243:14, 264:23, 265:24, 269:1 Chairman [86] - 130:12, 133:19, 134:3, 136:16, 137:25, 141:22, 153:20, 153:21, 154:5, 154:12, 155:21, 156:11, 156:12, 157:2, 157:6, 158:13, 158:20, 158:23, 159:8, 161:4, 161:5, 161:12, 161:14, 162:16, 167:12, 172:4, 174:24, 175:9, 176:9, 178:24, 179:2, 179:21, 180:21, 181:21, 182:11, 183:4, 184:3, 184:4, 187:1, 187:3, 188:3, 189:8, 189:14, 189:25, 190:5, 191:7, 192:11, 193:16, 194:13, 194:19, 195:8, 195:15, 195:24, 196:9, 197:1, 197:24, 198:24, 201:10, 204:1, 204:21, 206:4, 207:18, 208:6, 208:10, 208:23, 210:25, 211:16, 211:17, 212:20, 213:6, 218:11, 218:14, 231:18, 232:8, 236:17, 237:2, 237:7, 237:11, 238:8, 238:21, 240:11, 244:6, 253:2, 253:9, 261:1, 267:4 chairman [15] - 140:7, 140:15, 141:23, 142:19, 143:13, 145:17, 147:10, 148:8, 149:1, 150:12, 151:2, 152:21, 154:20, 180:7, 212:3 challenging [2] - 167:16, 168:8
C				
CAD [3] - 229:10, 229:14, 229:16				

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>chance [4] - 165:3, 192:24, 242:9, 268:18</p> <p>Change [1] - 226:1</p> <p>change [36] - 150:25, 181:13, 188:12, 195:17, 199:16, 199:17, 199:19, 199:24, 200:8, 200:14, 202:21, 203:19, 203:25, 204:3, 204:8, 204:9, 206:3, 206:19, 206:20, 217:12, 218:24, 219:10, 220:1, 220:8, 221:11, 221:13, 221:15, 221:18, 221:22, 222:11, 223:5, 225:3, 225:4, 225:12, 226:20, 227:11</p> <p>charged [3] - 126:22, 221:8, 225:14</p> <p>changes [22] - 200:23, 201:21, 203:23, 204:5, 217:20, 218:18, 219:20, 220:6, 220:25, 222:5, 225:1, 225:18, 227:6, 227:11, 227:18, 227:20, 228:7, 228:10, 228:17, 228:18, 229:20, 254:6</p> <p>changing [2] - 150:25, 225:8</p> <p>channel [34] - 133:7, 157:21, 159:16, 168:16, 171:1, 171:5, 171:6, 191:15, 220:8, 220:12, 220:21, 220:25, 221:15, 221:18, 221:21, 221:25, 222:3, 222:6, 225:5, 225:8, 227:14, 243:3, 249:4, 249:7, 250:12, 250:13, 250:21, 250:22, 251:8, 251:25, 252:1, 252:2, 257:17</p> <p>channels [6] - 226:17, 226:18, 227:10, 249:16, 249:17</p> <p>characterization [2] - 142:20, 184:9</p> <p>charged [1] - 180:4</p>	<p>chart [1] - 133:24</p> <p>charted [1] - 265:20</p> <p>chat [1] - 216:8</p> <p>check [8] - 128:25, 131:11, 151:16, 196:9, 254:10, 254:14, 266:10, 268:3</p> <p>checked [1] - 248:11</p> <p>checking [2] - 185:24, 216:10</p> <p>China [1] - 171:13</p> <p>choice [5] - 142:11, 154:18, 184:1, 237:18, 238:5</p> <p>choose [2] - 171:20, 207:17</p> <p>choosing [4] - 143:7, 186:23, 239:3, 239:12</p> <p>chose [2] - 181:22, 206:6</p> <p>chosen [4] - 175:8, 177:24, 178:4, 178:7</p> <p>Christiansen [1] - 195:21</p> <p>circumstance [1] - 143:23</p> <p>cited [1] - 194:18</p> <p>city [4] - 161:17, 179:24, 180:10, 200:6</p> <p>City [25] - 123:18, 136:9, 141:6, 141:14, 142:9, 143:21, 145:6, 145:14, 146:4, 148:23, 150:17, 150:22, 151:7, 151:18, 172:20, 177:25, 179:22, 179:25, 208:14, 208:18, 209:14, 209:17, 211:25, 212:9, 270:8</p> <p>civil [1] - 246:18</p> <p>claim [1] - 155:7</p> <p>clarification [2] - 149:17, 201:11</p> <p>clarify [3] - 125:8, 133:20, 239:5</p> <p>cleaned [1] - 193:10</p> <p>clear [11] - 126:1, 155:8, 169:15, 179:8, 204:5, 208:6, 214:6, 214:14, 239:5, 260:19, 267:9</p> <p>clearly [2] - 176:3, 213:17</p> <p>click [1] - 216:16</p>	<p>client [1] - 228:23</p> <p>clients [1] - 202:18</p> <p>climate [14] - 150:25, 199:16, 199:17, 199:19, 199:24, 200:8, 200:14, 202:20, 203:19, 203:24, 204:3, 204:7, 204:9, 206:3</p> <p>close [6] - 124:12, 163:1, 209:20, 210:7, 210:15, 249:20</p> <p>closer [2] - 186:10, 247:13</p> <p>closest [1] - 168:4</p> <p>CMS [1] - 210:3</p> <p>cobble [1] - 219:8</p> <p>collects [1] - 156:7</p> <p>column [4] - 128:3, 128:21, 133:1, 133:12</p> <p>combination [1] - 148:12</p> <p>comfortable [1] - 193:23</p> <p>coming [17] - 126:1, 126:3, 131:19, 132:21, 133:8, 134:25, 135:4, 135:25, 141:9, 147:20, 149:4, 149:8, 154:15, 183:7, 192:19, 209:15, 216:7</p> <p>commenced [1] - 124:8</p> <p>comment [1] - 181:2</p> <p>commercial [1] - 146:22</p> <p>Commission [13] - 123:8, 123:8, 123:9, 123:10, 123:10, 123:11, 123:12, 123:12, 123:13, 123:13, 123:14, 123:14, 258:4</p> <p>commissioned [4] - 188:14, 188:18, 189:3, 211:17</p> <p>commit [1] - 241:23</p> <p>committed [1] - 195:1</p> <p>commonly [1] - 199:23</p> <p>communicate [1] - 211:24</p> <p>communication [4] - 141:20, 141:24, 142:4, 212:12</p> <p>Communities [1] -</p>	<p>123:20</p> <p>communities [21] - 137:23, 139:7, 139:9, 139:11, 139:14, 140:1, 140:6, 140:10, 144:3, 144:6, 144:17, 147:9, 147:11, 150:4, 166:5, 184:10, 184:18, 193:19, 208:7, 235:12</p> <p>community [10] - 143:11, 144:23, 179:9, 179:10, 181:24, 182:20, 183:8, 184:14, 206:25, 254:2</p> <p>companies [7] - 255:17, 255:21, 256:3, 256:20, 258:8, 259:23, 261:2</p> <p>company [3] - 258:24, 260:6, 260:7</p> <p>compare [5] - 131:13, 139:13, 162:19, 168:9, 247:2</p> <p>compared [5] - 164:5, 196:5, 199:22, 246:20, 246:24</p> <p>comparing [4] - 138:23, 156:4, 160:23, 161:8</p> <p>Comparison [1] - 136:22</p> <p>comparison [6] - 138:9, 154:9, 164:7, 169:10, 229:21, 243:7</p> <p>comparisons [1] - 198:3</p> <p>competitive [1] - 232:1</p> <p>complete [7] - 195:21, 232:12, 232:15, 241:17, 241:19, 242:12, 270:4</p> <p>completed [1] - 204:23</p> <p>completely [3] - 125:17, 132:14, 198:4</p> <p>complexity [2] - 205:4, 206:11</p> <p>complicated [1] - 170:22</p> <p>complied [1] - 246:23</p> <p>component [3] - 230:21, 232:1, 266:23</p>	<p>components [6] - 224:4, 225:13, 228:25, 229:22, 230:4, 248:10</p> <p>compresses [1] - 223:21</p> <p>comprised [1] - 248:10</p> <p>computer [3] - 230:14, 246:23, 268:16</p> <p>concept [3] - 173:22, 187:6, 228:21</p> <p>concepts [1] - 153:11</p> <p>Conceptual [2] - 131:21, 162:10</p> <p>conceptual [6] - 136:24, 180:11, 187:7, 204:22, 205:25, 212:16</p> <p>concern [1] - 213:20</p> <p>Concerned [1] - 124:1</p> <p>concerns [1] - 176:5</p> <p>conclude [3] - 153:10, 186:21, 192:9</p> <p>conclusion [9] - 153:19, 154:3, 176:2, 186:15, 186:23, 194:14, 195:6, 195:25, 235:8</p> <p>conclusions [2] - 188:20, 233:5</p> <p>concrete [1] - 251:24</p> <p>condition [5] - 218:4, 223:11, 223:13, 223:14, 223:25</p> <p>conditions [4] - 224:7, 226:24, 230:4, 262:1</p> <p>conduct [2] - 188:19, 206:17</p> <p>conducted [2] - 161:16, 176:4</p> <p>confer [1] - 153:22</p> <p>confess [1] - 242:25</p> <p>confidence [2] - 160:10, 172:19</p> <p>confident [1] - 194:22</p> <p>configuration [1] - 250:6</p> <p>configured [1] - 268:17</p> <p>confined [1] - 192:16</p> <p>confinement [2] - 191:13, 191:14</p> <p>confirm [21] - 125:15, 125:18, 125:20, 176:15, 180:1, 195:12, 196:4, 196:22, 218:6, 218:9, 219:14, 220:23, 224:14,</p>
---	--	---	--	--

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>224:18, 227:4, 250:7, 254:13, 254:15, 261:4, 269:7, 269:9 confirmed [2] - 140:19, 260:9 confluence [4] - 147:24, 150:6, 150:22, 233:4 confusing [1] - 129:3 connect [1] - 226:18 connecting [1] - 264:12 connection [1] - 127:6 connector [1] - 252:24 consequence [1] - 172:11 CONSERVATION [1] - 122:2 Conservation [2] - 123:1, 228:13 consider [5] - 134:15, 144:21, 183:24, 198:21, 201:7 considerable [4] - 192:15, 207:14, 210:2, 249:7 considerably [1] - 138:22 consideration [7] - 161:20, 187:4, 187:10, 199:19, 205:2, 207:19, 228:23 considerations [2] - 196:1, 209:2 considered [19] - 127:9, 161:18, 165:7, 176:22, 186:22, 194:22, 203:22, 207:3, 207:16, 209:2, 217:24, 235:17, 237:14, 238:25, 239:3, 239:6, 239:12, 239:24, 253:23 considering [3] - 138:22, 238:25, 267:17 consistent [3] - 157:17, 261:19, 262:2 consistently [1] - 157:13 constantly [2] - 262:16, 264:3 constitute [1] - 150:13 constrained [1] - 159:19</p>	<p>construct [3] - 184:16, 224:2, 258:6 constructed [2] - 235:22, 250:12 constructing [1] - 179:3 construction [18] - 163:16, 164:4, 217:25, 218:15, 221:17, 223:11, 223:13, 223:14, 223:15, 223:25, 224:9, 230:18, 232:1, 232:10, 240:5, 240:7, 240:19, 240:21 consultant [1] - 204:23 consultation [4] - 207:5, 208:19, 265:20, 265:23 consultations [1] - 212:18 CONSULTATIONS [2] - 212:23, 271:18 contain [1] - 173:8 contained [1] - 256:15 contemplated [2] - 182:15, 206:9 context [10] - 129:14, 130:9, 130:11, 130:14, 151:5, 159:15, 160:25, 173:9, 188:7, 213:6 contingency [1] - 218:16 continue [6] - 163:1, 163:5, 216:13, 221:6, 231:23, 235:6 continues [1] - 252:21 contract [1] - 232:10 contracting [1] - 232:6 contractual [1] - 256:3 contribute [1] - 247:11 contributed [3] - 165:20, 166:7, 168:1 control [3] - 148:18, 215:22, 226:6 controlled [1] - 249:10 controlling [1] - 224:7 convenient [1] - 243:18 conversation [1] - 233:15 convey [1] - 243:3 corner [1] - 259:2 correct [60] - 125:6, 128:7, 128:8,</p>	<p>128:11, 128:24, 129:1, 129:7, 129:8, 129:12, 129:13, 130:13, 131:7, 131:8, 131:12, 131:16, 132:9, 132:10, 132:14, 132:25, 134:22, 134:23, 135:2, 135:5, 135:11, 135:12, 135:21, 137:12, 138:11, 138:12, 139:8, 139:9, 140:14, 142:20, 145:6, 147:9, 151:17, 151:23, 152:7, 152:16, 153:6, 156:10, 160:16, 166:10, 174:7, 179:12, 182:10, 196:10, 217:4, 227:17, 231:6, 233:17, 234:24, 235:23, 247:8, 258:6, 258:7, 258:13, 259:18, 260:13, 261:15 correction [1] - 267:7 correctly [2] - 162:22, 197:16 cost [68] - 161:18, 161:19, 215:8, 218:15, 220:1, 220:4, 221:22, 227:11, 228:20, 229:14, 229:21, 230:2, 230:10, 230:14, 230:23, 231:3, 231:11, 231:17, 231:20, 232:20, 235:16, 235:17, 235:23, 236:1, 236:13, 237:14, 237:16, 237:21, 238:6, 238:7, 238:9, 238:17, 239:7, 240:1, 240:6, 240:16, 240:20, 248:19, 249:3, 249:23, 250:11, 250:14, 252:18, 252:23, 253:5, 253:15, 253:19, 254:4, 255:5, 255:12, 259:8, 259:9, 259:12, 259:16, 259:19, 259:22, 259:25, 260:15, 261:7,</p>	<p>261:9, 261:10, 264:11, 264:14, 264:18, 265:8, 266:13 cost-benefit [1] - 232:20 costed [1] - 228:18 costing [3] - 230:25, 231:7, 253:7 costs [43] - 125:23, 127:8, 205:5, 206:12, 206:21, 218:10, 219:15, 220:25, 221:15, 221:20, 224:25, 227:5, 229:10, 229:16, 229:17, 229:23, 230:1, 230:19, 231:25, 235:20, 236:21, 237:12, 238:14, 240:7, 240:21, 240:24, 241:1, 243:2, 252:14, 252:16, 252:23, 253:22, 255:14, 255:15, 256:2, 256:4, 258:16, 259:5, 259:6, 260:8, 260:14, 260:15, 260:25 Counsel [2] - 123:10, 123:10 counsel [2] - 124:24, 212:21 country [1] - 199:2 county [1] - 252:24 County [12] - 178:6, 179:12, 180:1, 184:11, 190:10, 208:13, 208:17, 210:1, 212:1, 212:9, 237:1, 237:3 couple [5] - 151:10, 243:15, 243:24, 265:13, 267:18 course [1] - 208:25 courses [1] - 210:1 COURT [6] - 126:15, 126:18, 126:20, 128:14, 128:17, 128:19 Court [4] - 124:5, 214:4, 270:12, 270:17 court [3] - 126:22, 130:5, 242:6 cover [5] - 188:1, 218:14, 261:23, 262:4</p>	<p>covered [2] - 190:8, 224:24 covers [2] - 151:21, 152:9 CRCAG [4] - 145:10, 145:11, 209:7, 209:13 create [9] - 160:11, 160:12, 160:15, 190:11, 195:4, 195:5, 195:12, 195:14, 199:11 created [4] - 189:7, 211:10, 211:13, 213:1 creek [1] - 240:17 Creek [57] - 133:22, 136:10, 139:8, 139:13, 139:24, 140:11, 144:3, 144:16, 155:5, 158:18, 158:25, 159:5, 159:6, 164:5, 168:7, 168:13, 168:24, 177:13, 177:16, 177:21, 177:22, 178:15, 179:9, 181:17, 181:24, 182:10, 182:21, 183:6, 183:10, 184:12, 190:12, 191:2, 191:13, 193:13, 193:20, 196:3, 212:15, 226:5, 226:19, 226:25, 232:24, 233:21, 235:7, 235:8, 235:18, 235:24, 236:14, 237:4, 237:25, 240:1, 244:10, 244:18, 248:19, 249:8, 249:14, 251:15 Creek's [1] - 193:19 criteria [1] - 171:18 critical [3] - 151:4, 181:24, 220:14 CROSS [2] - 124:23, 271:10 cross [10] - 127:10, 127:16, 143:25, 167:15, 202:16, 202:17, 222:22, 223:6, 242:13, 269:3 Cross [6] - 127:13, 127:18, 127:19, 127:21, 136:20, 136:21 cross-examination [3]</p>
---	--	---	--	--

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>- 202:16, 202:17, 269:3</p> <p>CROSS-EXAMINES [2] - 124:23, 271:10</p> <p>cross-section [2] - 222:22, 223:6</p> <p>crossed [1] - 130:3</p> <p>crow [2] - 244:13, 244:15</p> <p>CRR [2] - 124:5, 270:11</p> <p>crystal [1] - 126:1</p> <p>crystal-clear [1] - 126:1</p> <p>CSR(A) [4] - 124:5, 124:6, 270:11, 270:16</p> <p>cube [5] - 156:7, 156:8, 156:10, 166:6, 166:16</p> <p>cubed [26] - 128:6, 128:23, 154:16, 155:11, 155:13, 155:18, 156:6, 157:16, 158:8, 162:11, 162:23, 163:16, 164:6, 164:12, 165:19, 166:18, 166:19, 166:20, 167:10, 167:11, 167:17, 170:7, 205:16</p> <p>cubes [6] - 142:23, 143:1, 154:23, 163:3, 169:16, 183:7</p> <p>cubic [76] - 128:6, 128:22, 128:23, 129:6, 129:11, 129:16, 130:15, 130:17, 130:22, 131:2, 131:6, 131:10, 132:13, 132:22, 132:23, 134:5, 134:9, 134:10, 134:22, 135:1, 135:5, 135:7, 135:8, 135:10, 135:14, 135:15, 135:20, 136:25, 137:3, 137:4, 137:5, 137:15, 137:16, 137:17, 138:3, 138:11, 138:23, 139:5, 139:16, 140:22, 140:23, 140:24, 140:25, 141:10, 141:11, 143:2, 144:1, 144:17, 144:24, 145:4, 145:8,</p>	<p>147:22, 149:7, 157:13, 157:21, 157:23, 164:17, 165:11, 165:12, 165:13, 171:2, 181:19, 182:7, 182:9, 190:11, 207:11, 208:2, 240:2, 240:9, 240:18, 249:13, 266:10, 266:12</p> <p>cuff [1] - 181:1</p> <p>Cunningham [1] - 123:12</p> <p>current [4] - 153:10, 248:21, 254:6, 258:23</p> <p>cursor [1] - 229:8</p> <p>Cusano [1] - 123:20</p> <p>cutting [1] - 243:25</p>	<p>158:8, 162:23, 163:3, 163:16, 164:12, 165:19, 166:19, 167:10, 167:11, 170:7, 171:13, 172:11, 173:8, 261:18</p> <p>Daniel [1] - 123:9</p> <p>data [3] - 168:18, 246:24, 248:9</p> <p>date [3] - 147:15, 220:3, 220:5</p> <p>dated [5] - 210:21, 212:16, 213:2, 213:8, 220:5</p> <p>Dated [1] - 270:8</p> <p>dates [2] - 212:13, 212:14</p> <p>DATES [2] - 212:22, 271:17</p> <p>Dave [1] - 159:2</p> <p>David [1] - 123:19</p> <p>days [7] - 245:24, 245:25, 246:4, 246:5, 262:11</p> <p>deal [1] - 202:6</p> <p>dealing [4] - 182:13, 190:9, 199:10, 217:19</p> <p>deals [1] - 136:23</p> <p>deal [3] - 212:18, 256:16, 265:20</p> <p>DEALT [2] - 212:23, 271:18</p> <p>Deanna [3] - 124:6, 270:15, 270:16</p> <p>debris [30] - 186:15, 186:16, 186:21, 186:23, 187:3, 187:10, 187:13, 187:16, 187:19, 187:22, 190:10, 190:20, 191:5, 191:24, 192:1, 192:4, 192:10, 192:22, 193:6, 193:8, 193:11, 217:24, 218:1, 218:3, 218:10, 218:15, 218:18</p> <p>Debris [1] - 217:22</p> <p>December [18] - 129:10, 186:19, 217:12, 218:19, 218:21, 219:21, 219:23, 220:2, 222:6, 222:8, 225:20, 225:23, 227:21, 227:24, 228:19, 250:1</p>	<p>decide [1] - 241:22</p> <p>decided [2] - 179:3, 179:4</p> <p>decision [7] - 179:7, 186:22, 188:5, 189:21, 198:5, 199:12, 207:17</p> <p>Decisions [1] - 185:18</p> <p>declare [1] - 204:7</p> <p>declared [1] - 199:15</p> <p>declines [2] - 200:25, 201:22</p> <p>decommissioning [1] - 257:22</p> <p>Decosemo [5] - 123:14, 156:20, 186:3, 215:19</p> <p>decosemo [1] - 185:25</p> <p>decrease [1] - 201:4</p> <p>decreasing [4] - 201:23, 202:21, 204:10, 204:13</p> <p>deeming [1] - 195:21</p> <p>deeper [4] - 140:17, 257:2, 257:7, 257:11</p> <p>deepest [1] - 223:3</p> <p>definitively [1] - 140:19</p> <p>deflected [1] - 190:20</p> <p>deflection [5] - 187:17, 218:3, 218:10, 218:15, 218:19</p> <p>Deflective [1] - 217:22</p> <p>deflector [2] - 186:16, 191:6</p> <p>deforested [1] - 196:5</p> <p>degree [1] - 250:5</p> <p>degrees [2] - 200:19, 200:20</p> <p>delay [1] - 159:20</p> <p>delivers [1] - 139:23</p> <p>Deltares [12] - 152:25, 155:2, 175:20, 177:13, 178:11, 180:17, 183:23, 188:16, 188:19, 189:3, 200:10, 204:6</p> <p>Deltares' [2] - 176:5, 199:15</p> <p>demand [2] - 199:5, 201:2</p> <p>demonstrated [1] - 233:21</p> <p>Department [3] - 147:16, 189:9, 189:17</p> <p>department [2] - 190:6, 238:15</p>	<p>department's [1] - 190:7</p> <p>deposits [1] - 192:18</p> <p>depth [8] - 194:21, 246:14, 252:2, 252:8, 252:10, 261:25, 262:23, 263:2</p> <p>depths [1] - 169:7</p> <p>describe [1] - 188:4</p> <p>described [4] - 127:20, 150:15, 192:3, 198:25</p> <p>describes [1] - 218:2</p> <p>description [1] - 214:6</p> <p>descriptions [1] - 225:15</p> <p>design [66] - 125:15, 125:16, 125:21, 129:9, 130:19, 132:7, 136:24, 139:4, 139:15, 140:20, 141:8, 141:19, 142:13, 143:7, 145:15, 147:7, 147:20, 149:4, 153:11, 153:13, 154:21, 155:2, 165:11, 166:2, 170:8, 170:9, 171:19, 171:22, 171:25, 173:12, 183:11, 183:15, 187:5, 187:11, 187:14, 187:15, 193:5, 200:1, 212:16, 217:21, 220:11, 221:9, 222:13, 223:5, 226:3, 226:14, 227:23, 228:22, 229:3, 234:15, 234:19, 234:20, 235:19, 236:5, 236:15, 243:4, 243:6, 248:21, 249:24, 249:25, 250:2, 250:8, 251:3, 251:5, 251:22, 262:18</p> <p>Design [21] - 131:21, 162:10, 217:23, 218:3, 218:21, 219:1, 219:4, 220:10, 220:15, 222:12, 222:21, 226:11, 228:7, 228:8, 229:25, 230:8, 231:1, 232:17, 250:10,</p>
	D			
	<p>D2 [1] - 215:9</p> <p>dam [46] - 128:6, 128:23, 131:18, 142:23, 142:25, 155:11, 155:13, 155:18, 156:6, 156:7, 156:8, 156:10, 162:11, 164:5, 164:6, 166:1, 166:6, 166:16, 166:18, 166:20, 169:16, 171:19, 195:3, 205:16, 221:17, 221:21, 222:13, 222:20, 222:22, 223:6, 224:2, 224:5, 224:7, 225:5, 225:9, 225:13, 225:19, 249:12, 251:1, 251:5, 262:24, 263:22, 266:18, 266:24</p> <p>Dam [1] - 212:15</p> <p>damage [4] - 150:10, 168:16, 198:7, 198:22</p> <p>damaged [6] - 168:24, 169:1, 169:5, 197:23, 236:3</p> <p>damages [10] - 149:25, 156:2, 232:22, 232:23, 233:5, 233:16, 234:16, 234:17, 235:8, 249:11</p> <p>damn [1] - 173:17</p> <p>dams [15] - 157:16,</p>			

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>250:16, 251:22 designated [1] - 210:10 designed [13] - 152:22, 163:20, 170:14, 172:13, 173:8, 173:10, 179:17, 187:13, 191:6, 192:2, 192:7, 199:19, 236:10 designing [2] - 252:12, 258:15 designs [2] - 228:21, 232:9 desirable [1] - 205:21 desired [1] - 130:21 destructive [1] - 198:7 detail [1] - 144:10 detailed [1] - 182:15 details [2] - 128:2, 179:16 detention [1] - 175:22 determination [1] - 208:15 determine [9] - 154:2, 170:3, 170:21, 176:7, 207:24, 209:5, 234:4, 256:7, 261:10 determined [2] - 170:6, 234:2 determining [1] - 258:16 detour [1] - 254:3 devastated [2] - 144:4, 144:13 develop [2] - 171:18, 246:19 developed [8] - 131:25, 168:6, 168:11, 228:20, 230:6, 231:7, 246:13, 250:9 developing [1] - 208:25 development [13] - 140:11, 146:22, 151:5, 187:5, 204:25, 209:18, 209:19, 209:23, 210:12, 231:20, 252:20, 252:21, 262:1 dictate [1] - 159:17 difference [5] - 155:7, 167:11, 169:2, 177:21, 222:1 differences [1] - 169:12 different [21] - 130:13,</p>	<p>148:12, 170:19, 176:20, 180:19, 180:24, 181:4, 181:14, 182:24, 183:13, 183:14, 202:1, 202:2, 213:7, 213:25, 241:1, 248:10, 262:22, 262:23, 262:24 differential [2] - 169:9, 171:10 differently [3] - 155:23, 157:19, 158:11 difficult [2] - 129:23, 225:7 difficulties [1] - 241:10 difficulty [2] - 125:5, 130:2 dig [1] - 174:20 dikes [1] - 181:5 DiPaolo [7] - 124:6, 126:13, 126:24, 127:1, 145:23, 270:15, 270:16 direct [2] - 218:15, 263:20 directional [1] - 258:13 directionally [2] - 257:13, 258:21 directly [2] - 159:13, 260:15 disagree [2] - 201:25, 203:20 discharge [13] - 133:5, 133:6, 133:7, 134:1, 134:8, 134:13, 134:14, 135:1, 138:10, 173:9, 226:17, 227:14, 252:1 discharges [2] - 139:2, 249:8 discharging [2] - 134:5, 139:20 Discovery [4] - 209:21, 233:23, 234:5, 235:3 discuss [1] - 212:7 discussed [3] - 130:10, 142:25, 173:24 discussing [10] - 161:7, 180:9, 181:12, 183:13, 197:17, 213:7, 224:20, 227:12, 245:4, 259:15</p>	<p>discussion [3] - 125:2, 209:13, 216:17 discussions [4] - 145:10, 145:16, 209:8, 213:23 dispute [1] - 207:13 distance [2] - 244:9, 249:11 distribution [3] - 181:15, 260:11, 260:16 district [1] - 149:13 diversion [40] - 129:15, 130:16, 130:18, 131:1, 131:2, 135:17, 141:9, 141:12, 155:9, 155:17, 155:24, 156:9, 157:20, 163:1, 170:1, 170:4, 170:5, 170:21, 170:25, 171:1, 171:6, 177:11, 187:9, 187:12, 191:13, 193:1, 208:7, 209:24, 218:1, 220:8, 220:12, 220:25, 222:5, 250:13, 250:22, 257:2, 257:17, 259:1 divert [1] - 162:25 diverted [2] - 163:11, 171:7 diverting [2] - 130:22, 141:10 diving [2] - 195:4, 195:13 DOCUMENT [2] - 212:24, 271:19 Document [1] - 161:23 document [48] - 127:12, 128:1, 131:20, 136:21, 146:4, 151:9, 151:11, 156:15, 161:21, 162:7, 162:14, 166:25, 167:4, 185:20, 185:22, 187:24, 188:2, 188:4, 188:21, 189:5, 189:7, 189:9, 189:16, 190:3, 190:6, 194:4, 194:16, 201:13, 202:8, 202:10, 203:7, 203:18,</p>	<p>204:22, 205:7, 211:17, 212:19, 212:25, 213:1, 215:16, 215:18, 219:25, 228:1, 229:6, 240:25, 241:2, 249:25, 267:18, 267:19 documentation [1] - 232:12 documents [6] - 202:16, 211:5, 211:6, 213:7, 214:1, 241:2 dollars [9] - 193:12, 229:18, 229:24, 230:1, 230:10, 230:15, 230:24, 259:17, 259:19 done [15] - 127:15, 149:15, 161:19, 176:6, 187:22, 191:20, 199:23, 213:19, 217:1, 231:2, 241:15, 242:9, 247:25, 261:9, 269:9 doomed [2] - 184:2, 184:10 double [1] - 216:16 Douglas [1] - 123:22 down [38] - 131:20, 136:1, 141:5, 141:16, 143:10, 146:5, 147:20, 149:4, 149:8, 156:18, 157:25, 159:21, 162:15, 181:10, 182:7, 183:24, 190:13, 190:15, 190:24, 192:19, 192:25, 193:14, 210:3, 210:18, 221:7, 222:11, 223:21, 228:2, 229:9, 229:11, 230:3, 238:19, 239:9, 241:14, 247:20, 265:22, 270:5 downloaded [1] - 185:20 downstream [43] - 137:6, 137:18, 138:21, 139:10, 140:25, 141:12, 143:1, 143:4, 143:5, 148:4, 149:23, 150:4, 154:24, 156:6, 157:24,</p>	<p>158:1, 158:10, 163:2, 163:5, 164:18, 164:23, 166:1, 166:4, 167:20, 167:24, 169:25, 183:7, 183:12, 183:16, 191:11, 207:10, 208:4, 208:20, 208:21, 209:9, 209:24, 219:6, 233:3, 233:12, 233:14, 234:24, 249:11, 251:24 downtown [2] - 147:2, 214:19 Dowsett [1] - 207:9 Dowsett's [1] - 207:6 draft [1] - 267:6 drag [1] - 192:6 drain [1] - 224:21 drainage [2] - 138:15, 227:10 drains [2] - 151:21, 170:12 draw [1] - 138:7 drawn [1] - 181:9 drilled [1] - 258:21 drilling [2] - 257:14, 258:13 drive [1] - 263:1 driven [1] - 262:15 driver [1] - 227:10 driving [1] - 206:13 dropping [3] - 192:18, 262:17, 264:4 drought [4] - 152:20, 204:20, 205:15, 205:18 droughts [1] - 200:5 dry [1] - 218:4 due [3] - 150:25, 187:18, 253:15 during [22] - 146:23, 157:12, 157:15, 164:18, 164:21, 168:7, 169:8, 171:2, 172:21, 173:15, 174:12, 200:25, 201:3, 205:18, 207:12, 207:16, 223:8, 223:15, 224:22, 251:18, 262:13, 268:2 Dutch [1] - 189:2 dynamic [1] - 206:23</p>
E				
<p>earliest [1] - 260:7</p>				

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>early [2] - 232:15, 269:18</p> <p>earth [2] - 133:7, 199:9</p> <p>earthen [2] - 173:23, 251:16</p> <p>East [1] - 147:2</p> <p>economic [2] - 151:4, 183:18</p> <p>Edmonton [3] - 123:2, 214:19, 214:21</p> <p>Edward [1] - 147:1</p> <p>effect [3] - 158:9, 173:16, 175:23</p> <p>effective [1] - 206:16</p> <p>effectively [1] - 172:19</p> <p>Effectiveness [1] - 186:9</p> <p>effectiveness [2] - 190:9, 262:4</p> <p>effects [11] - 130:21, 193:19, 194:17, 194:20, 197:4, 197:5, 198:20, 219:2, 219:12, 228:25</p> <p>efficacy [2] - 176:7, 176:19</p> <p>EIA [7] - 129:4, 161:22, 186:17, 195:21, 211:2, 213:16, 213:22</p> <p>eight [1] - 196:17</p> <p>either [5] - 154:10, 165:4, 237:11, 264:25, 266:24</p> <p>Elbow [48] - 125:22, 136:2, 137:24, 141:1, 142:15, 143:10, 143:12, 147:24, 148:4, 148:5, 148:7, 149:8, 149:12, 149:14, 150:6, 150:10, 151:14, 151:20, 151:25, 152:5, 152:18, 154:18, 168:1, 174:1, 174:7, 174:9, 175:5, 175:12, 175:17, 182:8, 184:7, 185:17, 188:6, 190:24, 191:12, 195:23, 198:6, 205:1, 206:8, 206:15, 207:21, 233:6, 233:9, 236:20, 238:18, 239:8, 247:24</p> <p>elected [1] - 188:13</p>	<p>election [1] - 188:13</p> <p>element [3] - 225:12, 263:21, 267:8</p> <p>elements [8] - 173:13, 174:14, 219:10, 224:20, 230:17, 230:20, 248:8, 248:11</p> <p>elevation [1] - 164:13</p> <p>embankment [18] - 220:14, 222:12, 222:13, 223:16, 223:18, 224:5, 225:19, 261:5, 261:6, 261:11, 261:13, 261:19, 262:3, 262:5, 266:1, 266:8, 266:14</p> <p>emergency [10] - 164:14, 173:20, 249:22, 249:23, 250:2, 250:11, 251:3, 251:16, 252:2, 252:18</p> <p>emphasize [2] - 204:21, 210:2</p> <p>employed [1] - 160:2</p> <p>EMS [1] - 250:24</p> <p>encompasses [1] - 224:19</p> <p>end [21] - 126:1, 126:5, 129:21, 142:14, 157:4, 181:9, 188:24, 211:12, 214:11, 214:13, 214:19, 218:17, 231:13, 243:5, 243:17, 255:20, 256:1, 257:16, 261:22, 265:2, 267:11</p> <p>ended [1] - 191:11</p> <p>ending [1] - 241:7</p> <p>Energy [3] - 258:3, 258:4, 258:9</p> <p>engagement [3] - 207:5, 208:18, 208:24</p> <p>engaging [1] - 197:7</p> <p>Engineering [1] - 251:12</p> <p>engineering [7] - 169:20, 169:23, 255:18, 255:22, 256:6, 258:15, 260:3</p> <p>engineers [1] - 246:18</p> <p>enlarge [1] - 167:3</p> <p>ensuing [1] - 193:21</p> <p>ensure [1] - 143:18</p> <p>ensuring [1] - 195:1</p>	<p>enter [1] - 256:2</p> <p>entered [2] - 148:13, 261:2</p> <p>entering [3] - 150:16, 187:19, 218:1</p> <p>enters [1] - 152:2</p> <p>entire [4] - 133:17, 157:14, 258:18, 258:20</p> <p>entirety [1] - 211:3</p> <p>entities [2] - 145:16, 236:22</p> <p>entitled [2] - 136:21, 217:22</p> <p>entity [1] - 237:11</p> <p>entrain [1] - 191:18</p> <p>Environment [13] - 135:24, 147:16, 148:19, 161:21, 179:14, 185:16, 186:8, 188:22, 189:10, 189:17, 195:20, 196:14, 228:14</p> <p>environment [2] - 198:19, 247:1</p> <p>environmental [11] - 183:19, 194:1, 194:12, 194:17, 194:20, 206:21, 212:6, 212:7, 228:25, 229:4, 267:6</p> <p>equal [5] - 165:7, 165:15, 166:3, 166:5, 232:23</p> <p>equivalent [4] - 167:22, 179:5, 183:10, 183:12</p> <p>Erlton [2] - 148:6, 149:13</p> <p>erosion [11] - 198:16, 219:9, 221:24, 222:4, 240:1, 240:16, 248:19, 251:4, 251:8, 251:17, 261:21</p> <p>ES-2 [1] - 196:15</p> <p>escape [1] - 172:20</p> <p>Especially [1] - 185:8</p> <p>especially [3] - 130:5, 180:12, 213:23</p> <p>essentially [4] - 141:3, 144:17, 179:18, 204:22</p> <p>aesthetics [1] - 178:3</p> <p>estimate [12] - 165:1, 169:24, 218:17, 220:1, 231:22, 240:5, 240:19, 249:21, 250:14,</p>	<p>259:23, 261:9, 266:16</p> <p>estimate's [1] - 247:3</p> <p>estimated [5] - 229:10, 229:14, 229:16, 229:17, 269:5</p> <p>Estimates [1] - 149:19</p> <p>estimates [8] - 136:18, 145:2, 169:13, 193:7, 245:8, 255:12, 263:15, 264:19</p> <p>estimation [1] - 262:22</p> <p>et [4] - 178:4, 197:22, 200:13, 218:5</p> <p>evaluate [2] - 131:25, 263:22</p> <p>evaluated [3] - 253:22, 253:24, 262:4</p> <p>evaluating [1] - 224:1</p> <p>evaporation [2] - 200:21, 201:20</p> <p>evapotranspiration [2] - 200:22, 201:20</p> <p>evening [1] - 265:10</p> <p>event [53] - 138:17, 138:19, 139:24, 139:25, 141:9, 141:18, 144:24, 145:7, 145:12, 145:19, 145:22, 148:14, 149:19, 149:20, 150:2, 150:20, 152:19, 153:13, 155:22, 157:12, 157:14, 158:2, 163:20, 165:3, 165:18, 167:9, 169:8, 170:15, 171:2, 171:23, 173:4, 173:6, 173:15, 175:15, 179:5, 179:6, 179:20, 181:25, 191:3, 191:9, 194:24, 197:23, 204:10, 205:14, 207:12, 208:22, 210:19, 234:9, 234:15, 235:4, 251:19</p> <p>events [10] - 171:12, 172:1, 175:10, 175:18, 175:19, 176:21, 176:24, 176:25, 181:3, 218:5</p> <p>evidence [5] - 138:5, 175:10, 186:25,</p>	<p>198:7, 202:8</p> <p>exact [8] - 143:20, 158:8, 158:9, 160:17, 168:3, 169:10, 212:13, 265:21</p> <p>exactly [2] - 191:10, 225:7</p> <p>examination [3] - 202:16, 202:17, 269:3</p> <p>EXAMINES [2] - 124:23, 271:10</p> <p>example [2] - 177:3, 191:15</p> <p>excavated [1] - 220:22</p> <p>excavating [1] - 257:7</p> <p>excavation [5] - 227:13, 250:21, 250:22, 250:23, 250:25</p> <p>exceed [1] - 224:10</p> <p>exceeds [2] - 157:23, 171:23</p> <p>excellent [1] - 215:10</p> <p>excess [3] - 132:19, 135:15, 157:16</p> <p>excluding [1] - 232:24</p> <p>excuse [3] - 129:17, 141:25</p> <p>exercise [1] - 134:16</p> <p>Exhibit [61] - 129:5, 129:10, 136:24, 146:2, 146:6, 146:9, 146:10, 151:10, 153:1, 153:2, 156:19, 161:24, 162:3, 166:9, 166:12, 166:23, 175:20, 178:1, 178:18, 178:20, 178:22, 182:9, 185:15, 186:19, 187:25, 194:2, 194:3, 196:13, 196:15, 199:14, 203:5, 204:18, 206:5, 207:6, 210:21, 213:3, 215:9, 215:15, 217:11, 217:15, 217:19, 218:7, 218:23, 219:14, 220:7, 220:23, 220:24, 222:10, 224:15, 225:25, 227:5, 227:6, 228:2, 229:7, 240:3, 240:7, 240:22, 241:3, 250:1, 252:14,</p>
--	--	--	---	--

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>252:25 exhibit [16] - 151:24, 152:4, 152:11, 152:15, 156:16, 185:13, 201:13, 203:12, 213:1, 215:24, 216:1, 217:4, 217:10, 220:4, 231:21, 240:14 exhibits [1] - 196:13 existing [9] - 193:21, 256:15, 257:3, 257:7, 257:10, 257:15, 257:16, 257:23, 258:20 exit [6] - 227:14, 249:4, 249:15, 249:16, 249:17, 251:23 expect [3] - 165:21, 260:4, 263:8 expected [2] - 165:4, 175:24 expensive [2] - 253:20, 257:24 experience [2] - 144:23, 192:6 experienced [1] - 214:17 experiences [1] - 199:11 experiencing [1] - 126:4 expert [2] - 246:11, 260:18 expertise [1] - 176:17 experts [2] - 261:6, 266:7 explained [1] - 204:14 exploration [1] - 223:9 exposure [1] - 261:22 extend [1] - 251:22 extended [3] - 158:1, 251:23, 268:5 extent [1] - 199:3 external [1] - 129:18 extirpated [1] - 195:22 extreme [3] - 171:12, 172:10, 205:14 eyesight [1] - 228:5</p>	<p>facility [4] - 139:2, 139:20, 205:12, 234:8 fact [12] - 125:16, 131:15, 135:13, 139:15, 141:19, 145:13, 157:10, 158:12, 160:1, 209:18, 220:3, 263:16 factor [8] - 128:9, 130:24, 163:6, 163:18, 171:5, 187:9, 199:12, 199:22 factoring [1] - 163:9 factors [1] - 181:23 failure [2] - 164:11, 261:23 fair [10] - 140:15, 154:5, 159:23, 179:23, 189:15, 192:21, 193:12, 195:15, 252:13, 266:15 fairly [1] - 250:4 fall [4] - 167:20, 209:3, 209:4, 247:19 falling [1] - 138:17 falls [2] - 169:4, 250:15 false [4] - 233:7, 233:10, 233:25, 234:1 familiar [6] - 144:10, 144:11, 198:10, 199:2, 217:13, 243:1 far [10] - 158:19, 158:25, 159:5, 177:5, 178:2, 198:16, 240:8, 250:5 fashion [1] - 247:5 fast [3] - 223:22, 241:11, 263:1 FC1 [1] - 178:21 feature [2] - 158:15, 221:24 Features [1] - 218:25 features [2] - 219:16, 219:21 February [1] - 160:5 federal [2] - 172:8, 213:23 feedback [2] - 187:18, 253:11 feet [2] - 256:22 fell [4] - 165:19, 245:21, 245:24, 246:6 felt [1] - 262:13</p>	<p>few [4] - 128:2, 232:19, 232:21 field [3] - 162:20, 247:6, 260:19 fifth [1] - 133:1 figure [1] - 268:22 filed [4] - 160:4, 186:17, 217:12, 228:15 filing [9] - 213:22, 218:20, 219:22, 222:7, 225:21, 227:23, 229:5, 229:24, 231:1 filings [1] - 262:11 fill [1] - 132:18 filtering [1] - 247:21 final [17] - 212:16, 217:15, 218:2, 218:20, 219:3, 219:22, 220:15, 222:21, 225:23, 226:11, 227:23, 228:8, 229:24, 231:1, 232:17, 250:5, 250:10 finalizing [1] - 232:9 fine [4] - 185:4, 203:12, 203:13, 242:14 fingertips [1] - 174:21 finished [2] - 130:1, 266:2 Fiona [1] - 123:10 first [10] - 127:17, 128:3, 185:14, 216:1, 217:23, 239:14, 241:2, 244:9, 256:5 fish [8] - 194:9, 195:6, 195:14, 219:1, 219:10, 219:12, 219:16, 219:20 Fish [1] - 218:25 fit [1] - 232:16 Fitch [11] - 123:17, 127:15, 202:4, 242:11, 243:14, 243:20, 243:23, 244:4, 269:1, 269:12, 269:16 FITCH [11] - 127:14, 202:4, 202:24, 203:1, 203:3, 203:5, 203:8, 203:11, 243:14, 269:1, 269:15 Fitch's [1] - 202:18 five [5] - 132:5, 164:1, 185:6, 216:18,</p>	<p>255:12 five-minute [1] - 216:18 Flats [2] - 198:6, 198:11 flatter [2] - 221:19, 247:14 flaw [1] - 165:17 Fleck [1] - 123:13 flies [1] - 244:13 flip [1] - 204:15 flood [226] - 125:10, 125:12, 125:15, 125:16, 125:21, 128:5, 130:19, 131:16, 132:2, 132:5, 132:6, 132:7, 132:8, 132:9, 132:12, 132:21, 133:14, 133:20, 134:16, 134:21, 135:7, 135:25, 136:1, 136:3, 136:4, 136:11, 136:13, 136:15, 136:25, 137:11, 137:20, 138:17, 138:20, 139:4, 139:5, 139:6, 139:12, 139:15, 139:18, 139:24, 139:25, 140:4, 140:9, 140:11, 140:20, 141:4, 141:8, 141:13, 141:16, 141:19, 141:20, 142:6, 142:11, 142:13, 142:14, 142:22, 143:7, 143:8, 143:9, 143:15, 143:18, 143:23, 144:1, 144:7, 144:13, 144:18, 144:19, 144:25, 145:2, 145:4, 145:12, 145:14, 145:15, 145:19, 145:22, 147:7, 147:8, 147:13, 147:15, 147:20, 147:21, 148:5, 148:14, 148:16, 148:18, 149:4, 149:6, 149:8, 149:12, 149:20, 149:25, 150:2, 152:22, 153:4, 153:13, 153:16, 153:19, 154:8, 154:10, 154:15, 155:4, 155:9,</p>	<p>155:17, 156:2, 157:9, 157:12, 157:14, 160:12, 160:15, 160:20, 160:21, 161:16, 162:12, 163:10, 163:13, 163:20, 164:25, 165:6, 165:11, 165:25, 166:4, 167:9, 168:8, 169:8, 169:17, 169:21, 170:15, 171:2, 172:5, 172:6, 172:12, 172:14, 172:20, 172:22, 173:1, 175:8, 175:25, 176:2, 176:5, 176:7, 176:21, 177:3, 177:7, 177:9, 177:19, 177:23, 179:10, 180:4, 180:18, 181:4, 181:11, 182:7, 183:2, 183:18, 184:6, 184:19, 188:5, 191:3, 191:4, 192:18, 192:22, 197:23, 198:1, 198:5, 204:12, 204:25, 205:11, 206:7, 206:14, 207:9, 207:12, 207:13, 207:14, 207:20, 207:24, 208:5, 208:15, 208:19, 208:21, 208:22, 209:5, 209:11, 210:3, 210:15, 210:16, 211:22, 211:23, 218:5, 233:6, 233:9, 233:16, 233:24, 234:2, 234:7, 234:12, 234:16, 234:17, 234:19, 234:20, 234:21, 234:22, 234:23, 234:24, 235:3, 235:10, 235:16, 235:19, 236:5, 236:15, 236:20, 237:3, 237:17, 238:4, 238:23 Flood [8] - 123:21, 141:18, 141:21, 142:5, 145:11, 209:8, 209:12 flood-free [1] - 141:20 flooded [3] - 141:18, 210:6, 210:8</p>
F				
<p>face [2] - 261:10, 261:18 faced [1] - 165:25 facilitate [1] - 219:12 facilities [2] - 166:3, 168:16</p>				

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>flooding [23] - 137:3, 137:12, 137:19, 137:21, 137:22, 138:4, 139:7, 142:15, 146:20, 146:24, 150:19, 159:11, 159:15, 159:24, 160:19, 172:24, 180:2, 180:8, 180:13, 183:8, 209:22, 237:18, 238:5</p> <p>floodplain [2] - 210:5, 210:6</p> <p>floods [3] - 175:5, 175:11, 204:16</p> <p>floodway [1] - 210:10</p> <p>floor [1] - 124:17</p> <p>flow [34] - 136:6, 137:5, 138:7, 139:16, 148:13, 148:23, 159:16, 159:24, 160:22, 165:10, 165:21, 167:17, 167:22, 167:24, 167:25, 169:1, 169:2, 169:7, 169:10, 169:21, 169:24, 170:21, 171:7, 173:18, 198:9, 200:24, 200:25, 204:5, 205:17, 205:20, 209:14, 238:19, 239:9, 252:11</p> <p>Flow [1] - 136:22</p> <p>flowing [2] - 149:11, 149:18</p> <p>flows [28] - 138:18, 143:1, 149:23, 150:16, 153:25, 154:15, 154:24, 157:10, 163:4, 167:19, 167:24, 168:15, 173:23, 180:11, 183:11, 183:16, 184:7, 191:16, 201:4, 201:21, 201:23, 202:22, 203:24, 204:4, 204:11, 204:13, 243:3, 247:2</p> <p>flying [1] - 244:21</p> <p>focused [2] - 205:10, 264:5</p> <p>folks [4] - 162:8, 213:18, 243:13, 267:17</p> <p>follow [1] - 266:17</p> <p>followed [1] - 229:3</p>	<p>following [8] - 200:11, 218:23, 220:7, 222:10, 225:25, 237:17, 238:4, 244:23</p> <p>Foothills [1] - 247:14</p> <p>footprint [3] - 198:4, 198:23, 259:1</p> <p>FOR [4] - 125:9, 125:16, 139:5, 171:15</p> <p>forbid [1] - 191:4</p> <p>force [1] - 192:6</p> <p>forces [1] - 192:4</p> <p>forecasts [1] - 176:1</p> <p>foregoing [1] - 270:3</p> <p>forest [1] - 247:7</p> <p>forgive [2] - 197:10, 237:8</p> <p>form [2] - 160:18, 256:9</p> <p>forms [2] - 181:4, 231:23</p> <p>forward [3] - 171:24, 228:22, 230:6</p> <p>forwarded [1] - 127:16</p> <p>foundation [5] - 189:3, 223:3, 223:17, 224:2, 226:24</p> <p>four [3] - 152:1, 241:15, 260:23</p> <p>FPDR [1] - 222:7</p> <p>frame [1] - 188:4</p> <p>framework [1] - 179:18</p> <p>Free [8] - 123:21, 141:18, 141:21, 142:5, 145:10, 145:11, 209:8, 209:12</p> <p>free [2] - 141:20, 251:1</p> <p>freeboard [5] - 180:16, 236:8, 262:24, 263:22, 263:24</p> <p>frequency [4] - 136:17, 144:22, 145:2, 181:11</p> <p>frequently [1] - 193:10</p> <p>Friend [1] - 123:11</p> <p>friend [3] - 127:11, 162:5, 202:6</p> <p>front [6] - 181:9, 187:25, 202:11, 231:21, 249:6, 268:17</p> <p>full [7] - 162:25, 180:13, 211:5, 243:1, 251:8, 261:13, 266:19</p>	<p>fully [2] - 197:25, 213:1</p> <p>function [1] - 154:6</p> <p>functioning [2] - 150:14, 150:21</p> <p>funding [1] - 179:15</p> <p>future [4] - 152:19, 198:22, 205:24, 227:2</p>	<p>239:8, 248:13, 250:11, 261:5, 262:2, 262:5, 262:16, 262:21</p> <p>GIVEN [1] - 271:15</p> <p>glad [1] - 215:4</p> <p>Glenbow [1] - 151:20</p> <p>Glenmore [47] - 137:11, 137:22, 137:24, 138:15, 140:21, 141:2, 142:16, 142:22, 143:1, 143:4, 143:5, 143:12, 145:3, 148:4, 149:9, 149:23, 150:5, 150:6, 151:22, 152:2, 152:6, 152:18, 154:1, 154:7, 154:16, 154:24, 154:25, 161:17, 165:24, 166:1, 166:4, 168:12, 168:19, 169:22, 170:3, 183:12, 200:4, 207:7, 207:8, 207:11, 208:4, 208:8, 209:10, 233:3, 246:25, 247:2, 248:2</p> <p>glitch [1] - 217:1</p> <p>glitches [1] - 267:18</p> <p>god [1] - 191:3</p> <p>golf [1] - 210:1</p> <p>goodnight [1] - 269:17</p> <p>gotta [1] - 264:3</p> <p>government [17] - 140:16, 172:9, 182:19, 188:12, 188:13, 188:14, 188:18, 189:12, 189:19, 189:24, 199:7, 199:8, 204:24, 206:6, 231:17, 238:13</p> <p>Government [4] - 179:2, 182:17, 184:11, 188:10</p> <p>graded [1] - 168:5</p> <p>granted [1] - 124:13</p> <p>graph [3] - 169:20, 169:23, 169:25</p> <p>graphs [2] - 175:25, 176:8</p> <p>gravel [4] - 191:21, 254:12, 254:15, 255:4</p> <p>gravelly [1] - 247:18</p>	<p>grazing [1] - 196:20</p> <p>great [5] - 194:21, 202:6, 242:19, 243:19, 268:3</p> <p>greater [6] - 136:2, 136:3, 145:14, 176:21, 176:25, 247:12</p> <p>grid [2] - 246:13, 246:17</p> <p>grids [1] - 246:15</p> <p>ground [6] - 174:18, 198:8, 247:4, 247:5, 257:19, 257:21</p> <p>groundwater [3] - 180:2, 180:8, 180:13</p> <p>group [1] - 209:13</p> <p>Group [2] - 123:21, 124:1</p> <p>groups [2] - 209:9, 212:8</p> <p>growing [1] - 150:25</p> <p>guess [7] - 159:21, 183:24, 211:20, 239:14, 241:16, 241:21, 258:5</p> <p>guidelines [1] - 262:24</p> <p>guides [1] - 231:22</p> <p>guy [1] - 268:9</p> <p>guys [1] - 233:14</p>
G				
<p>G-2 [12] - 219:22, 220:23, 222:7, 224:14, 225:20, 227:4, 227:22, 228:19, 240:7, 240:9, 240:22, 252:15</p> <p>G2 [4] - 216:1, 217:14, 218:7, 218:20</p> <p>gate [5] - 164:10, 226:5, 226:8, 226:15, 226:25</p> <p>gates [5] - 135:22, 163:1, 173:18, 176:2, 226:16</p> <p>gauge [6] - 168:7, 168:10, 168:13, 168:18, 246:21, 248:3</p> <p>gauges [5] - 168:22, 168:24, 169:1, 169:6, 248:12</p> <p>Gavin [4] - 123:17, 127:14, 202:4, 269:1</p> <p>general [4] - 201:17, 202:1, 202:20, 219:24</p> <p>generally [9] - 140:3, 140:5, 151:3, 159:17, 224:23, 225:10, 247:16, 250:25, 263:10</p> <p>generate [2] - 214:5, 262:24</p> <p>generated [2] - 213:13, 213:15</p> <p>geometry [2] - 224:7, 225:13</p> <p>geotechnical [3] - 223:8, 226:22, 250:6</p> <p>Gino [1] - 123:21</p> <p>given [25] - 128:25, 139:2, 150:20, 159:16, 160:22, 171:7, 171:12, 175:7, 183:6, 192:14, 202:6, 214:8, 231:2, 238:2, 238:16, 238:18,</p>				
H				
<p>habitat [6] - 194:8, 195:4, 195:6, 195:12, 195:14, 195:17</p> <p>habitats [1] - 195:19</p> <p>hairs [1] - 172:18</p> <p>half [2] - 261:4, 266:21</p> <p>hamlet [2] - 177:15, 177:18</p> <p>hand [3] - 162:17, 163:19, 253:6</p> <p>hands [1] - 265:4</p> <p>happy [2] - 162:20, 202:12</p> <p>hard [2] - 129:23, 164:25</p> <p>harming [1] - 251:20</p> <p>hauling [1] - 221:20</p> <p>have.. [1] - 230:12</p> <p>hazard [3] - 138:6, 172:6, 210:10</p> <p>head [1] - 198:11</p> <p>headers [1] - 132:10</p> <p>heading [2] - 131:21, 131:22</p> <p>headphones [2] -</p>				

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>268:11, 268:22 Heaney [1] - 123:9 hear [2] - 125:19, 129:23 hearing [6] - 126:6, 194:21, 197:6, 199:21, 214:20, 215:20 heavier [1] - 181:9 heavily [1] - 175:24 heavy [2] - 192:1, 192:2 HEBERT [87] - 124:20, 125:7, 125:11, 125:13, 125:17, 129:22, 140:7, 140:15, 141:23, 142:2, 142:17, 143:13, 145:17, 147:10, 148:8, 150:12, 151:2, 151:16, 151:23, 152:3, 152:7, 152:11, 152:15, 152:21, 153:20, 154:4, 154:12, 156:11, 157:2, 157:6, 158:13, 158:20, 159:1, 159:7, 159:12, 161:4, 161:12, 174:24, 176:9, 176:15, 178:16, 178:24, 180:5, 180:21, 181:21, 182:11, 184:3, 187:1, 188:3, 189:8, 189:14, 189:25, 190:5, 193:16, 194:13, 195:8, 195:24, 196:7, 197:1, 197:14, 198:24, 201:9, 204:21, 206:4, 207:18, 208:6, 208:10, 208:23, 210:23, 211:16, 212:20, 218:11, 231:18, 232:5, 233:1, 236:17, 237:2, 237:7, 238:8, 238:21, 240:11, 240:23, 241:4, 253:8, 254:19, 267:4, 271:6 Hebert [19] - 125:6, 126:19, 140:9, 140:14, 142:3, 145:23, 154:21, 176:12, 180:15,</p>	<p>197:13, 205:7, 210:20, 211:19, 217:8, 217:19, 218:13, 228:6, 236:24, 239:22 height [3] - 266:11, 266:20, 266:25 held [1] - 212:18 HELD [2] - 212:23, 271:18 help [1] - 268:13 helpful [2] - 243:8, 268:5 Hemmera [2] - 212:7, 213:11 hereby [1] - 270:3 hesitate [2] - 182:3, 182:25 hiccup [1] - 156:24 high [4] - 140:17, 168:15, 204:5, 224:12 higher [5] - 157:24, 165:25, 180:3, 233:18, 235:11 highest [1] - 263:18 highlight [2] - 172:5, 196:17 highlighted [2] - 137:9, 211:22 Highway [3] - 237:16, 238:3, 259:3 highways [1] - 198:8 Hill [3] - 196:23, 197:9, 197:13 hindsight [1] - 186:14 historic [1] - 175:3 historical [1] - 178:25 hold [5] - 129:17, 133:9, 170:15, 180:20, 182:10 holding [1] - 265:11 holds [1] - 133:10 hope [1] - 157:3 hoping [5] - 214:25, 241:15, 264:8, 264:16, 264:22 horizontal [2] - 222:16, 222:24 host [3] - 176:13, 215:12, 218:8 hour [1] - 246:14 hours [1] - 241:15 huge [2] - 190:13, 190:23 hump [1] - 158:6 hundred [7] - 156:5, 164:1, 172:7, 174:15, 178:9, 248:14</p>	<p>hurry [1] - 162:9 hydraulic [2] - 132:1, 226:8 hydro [5] - 169:20, 169:23, 169:25, 175:25, 176:7 hydrograph [4] - 157:14, 158:4, 168:11, 177:6 hydrographs [8] - 154:11, 160:18, 176:6, 176:20, 176:21, 176:24, 177:10, 180:17 hydrologists [1] - 246:18 hydrometric [1] - 175:16 hypothetical [5] - 167:23, 182:13, 182:22, 183:5, 243:3</p> <p style="text-align: center;">I</p> <p>IA [1] - 195:21 IAAC [1] - 267:6 lan [1] - 207:6 idea [1] - 257:9 identification [1] - 148:20 identified [5] - 209:1, 228:10, 228:17, 259:8, 260:14 identify [2] - 141:25, 229:20 ifeoma [1] - 124:1 illustrated [1] - 199:13 imagine [1] - 177:22 impact [9] - 148:23, 150:4, 192:2, 192:22, 200:13, 201:7, 203:22, 207:16, 229:4 impacting [1] - 171:12 impacts [9] - 182:3, 183:20, 193:18, 194:1, 194:23, 197:8, 197:18, 199:24, 251:20 imperative [1] - 179:8 implication [1] - 207:20 implications [1] - 182:4 implicit [1] - 249:17 important [11] - 155:23, 156:2, 156:16, 160:24, 161:1, 161:8, 180:7, 181:2, 181:3, 201:1,</p>	<p>258:7 impounded [1] - 163:8 improve [2] - 223:2, 227:2 in-line [2] - 131:18, 226:16 in-stream [2] - 175:23, 201:4 include [8] - 142:22, 146:24, 197:2, 205:1, 213:9, 221:6, 250:2, 250:20 included [6] - 213:16, 213:22, 220:18, 222:19, 226:15, 237:21 includes [6] - 128:9, 155:4, 177:19, 196:17, 220:11, 222:14 including [1] - 212:8 inclusive [2] - 218:16, 249:16 inconsistent [1] - 261:25 incorporated [3] - 218:17, 226:18, 229:1 incorporates [1] - 170:1 incorporation [2] - 224:20, 228:23 increase [10] - 171:4, 200:18, 200:21, 201:19, 205:4, 205:22, 223:17, 224:3, 225:15 increased [7] - 165:22, 178:10, 178:12, 186:20, 200:3, 204:19, 206:10 increasing [3] - 202:21, 203:23, 204:10 independent [1] - 188:17 indicate [2] - 164:16, 241:8 indicated [8] - 134:24, 169:17, 175:4, 193:5, 200:17, 261:11, 262:10, 265:15 indicates [3] - 128:4, 138:9, 182:9 indication [1] - 193:9 indicative [1] - 139:1 individuals [1] - 189:10</p>	<p>indulgence [1] - 178:25 inferences [1] - 138:7 infiltrate [1] - 247:20 infiltration [2] - 174:13, 245:6 inflation [1] - 230:17 inflow [2] - 134:21, 139:21 inflows [2] - 139:3, 169:11 influence [1] - 168:12 information [15] - 138:5, 150:8, 165:7, 174:25, 175:7, 211:24, 211:25, 213:21, 226:22, 228:15, 248:2, 255:5, 260:5, 260:24, 267:8 infrastructure [11] - 171:17, 189:21, 198:13, 198:22, 237:4, 237:15, 238:3, 238:11, 238:12, 238:13, 238:16 Infrastructure [1] - 185:17 Inglewood [1] - 147:4 initiate [1] - 261:21 inlet [3] - 187:12, 218:1, 227:9 input [2] - 143:22, 187:23 inside [1] - 223:19 instance [6] - 155:10, 160:5, 176:6, 177:1, 177:2, 186:16 instances [1] - 208:16 instantaneously [1] - 169:7 instead [1] - 139:14 intake [11] - 129:3, 129:6, 131:14, 155:12, 155:13, 155:19, 226:7, 226:17, 249:15, 249:16, 249:17 integral [1] - 226:6 interchanging [1] - 155:25 interest [5] - 183:25, 184:5, 197:17, 199:4 interested [1] - 197:20 interface [1] - 220:19 interim [6] - 217:21, 220:11, 221:8, 222:13, 226:3, 226:14</p>
--	--	--	--	--

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>Interim [5] - 217:23, 218:25, 220:10, 222:12, 228:7</p> <p>interject [1] - 236:17</p> <p>interjecting [2] - 126:25, 184:4</p> <p>interrupt [1] - 254:19</p> <p>interruption [1] - 129:19</p> <p>interval [4] - 165:2, 173:2, 262:14, 262:21</p> <p>intervals [2] - 160:10, 263:23</p> <p>introduction [2] - 154:13, 228:11</p> <p>introductions [2] - 213:12, 213:17</p> <p>inundation [8] - 144:6, 144:8, 144:10, 146:21, 160:4, 160:12, 160:15, 161:17</p> <p>invite [3] - 157:7, 159:12, 180:21</p> <p>involved [1] - 143:17</p> <p>IR [2] - 240:24, 243:1</p> <p>IR-1 [1] - 240:3</p> <p>IR3-02 [1] - 166:11</p> <p>irregardless [2] - 261:16</p> <p>irreparably [1] - 194:8</p> <p>Island [1] - 147:2</p> <p>Issue [1] - 153:9</p> <p>issue [1] - 264:13</p> <p>issued [2] - 189:18, 190:6</p> <p>issues [5] - 168:7, 168:11, 190:6, 214:20, 231:12</p> <p>IT [1] - 269:19</p> <p>it'll [2] - 185:20, 232:14</p> <p>item [3] - 198:17, 245:3, 267:5</p> <p>items [10] - 194:22, 205:2, 205:3, 208:25, 221:8, 224:23, 230:2, 230:3, 238:6, 244:8</p> <p>iteration [1] - 229:3</p> <p>itself [8] - 139:11, 150:21, 173:17, 200:4, 209:17, 221:16, 244:24, 257:8</p> <p>Iwanyshyn [1] - 123:12</p>	J	<p>knowing [1] - 182:18</p> <p>knowledge [1] - 250:4</p> <p>known [3] - 231:25, 248:6, 248:11</p> <p>Kruhlik [2] - 123:16, 242:11</p>	<p>247:15</p> <p>letter [1] - 195:21</p> <p>letterhead [1] - 189:22</p> <p>letting [1] - 267:11</p> <p>level [30] - 131:6, 140:17, 171:18, 171:21, 178:10, 178:13, 179:18, 179:19, 180:12, 180:16, 184:13, 205:23, 206:1, 207:7, 207:8, 224:12, 226:1, 226:3, 227:11, 227:21, 240:5, 240:20, 248:23, 249:1, 249:5, 249:18, 261:19, 262:19, 263:3, 263:19</p> <p>Level [1] - 178:9</p> <p>level's [2] - 262:16, 264:3</p> <p>levels [3] - 200:22, 201:20, 224:10</p> <p>levies [1] - 181:5</p> <p>levy [1] - 171:20</p> <p>life [1] - 170:11</p> <p>light [2] - 181:17, 240:10</p> <p>likely [6] - 186:11, 191:19, 193:14, 202:23, 217:1, 240:12</p> <p>Limitations [1] - 127:21</p> <p>limited [3] - 150:24, 199:10, 261:24</p> <p>line [11] - 131:18, 177:25, 210:4, 210:5, 221:2, 221:8, 226:16, 244:24, 258:6, 262:15, 269:10</p> <p>lined [1] - 219:7</p> <p>lines [14] - 218:9, 218:14, 219:15, 220:23, 222:2, 224:14, 224:17, 227:4, 250:15, 259:12, 260:11, 260:16</p> <p>lining [2] - 227:14, 251:23</p> <p>list [2] - 185:19, 214:25</p> <p>listed [6] - 129:11, 132:5, 240:2, 240:4, 240:17, 240:19</p> <p>listen [1] - 243:20</p>	<p>lists [1] - 220:4</p> <p>literature [1] - 248:8</p> <p>live [1] - 141:1</p> <p>lives [1] - 147:4</p> <p>living [1] - 210:19</p> <p>LLOW [5] - 157:17, 226:4, 226:12, 226:19, 227:6</p> <p>load [6] - 131:6, 187:4, 192:16, 193:8, 223:17, 223:18</p> <p>loaded [1] - 162:6</p> <p>loading [1] - 167:1</p> <p>local [6] - 139:21, 142:8, 143:15, 163:24, 208:12, 238:23</p> <p>localities [1] - 207:25</p> <p>localized [1] - 170:11</p> <p>locate [1] - 174:22</p> <p>located [8] - 138:2, 139:10, 198:11, 222:16, 222:24, 226:4, 258:24, 259:1</p> <p>location [13] - 159:6, 160:22, 171:21, 192:14, 226:12, 226:14, 226:21, 227:13, 227:15, 250:7, 262:3, 263:16, 264:2</p> <p>locations [3] - 183:14, 248:11, 250:6</p> <p>look [27] - 132:20, 133:24, 133:25, 134:20, 134:25, 135:6, 138:8, 139:4, 140:20, 143:24, 147:25, 161:20, 165:9, 176:19, 183:17, 212:11, 217:7, 232:20, 242:8, 251:18, 259:12, 262:20, 262:22, 262:25, 263:2, 265:25, 268:6</p> <p>looked [7] - 144:7, 144:9, 148:2, 160:3, 225:10, 231:13, 252:15</p> <p>looking [15] - 127:18, 133:5, 134:2, 140:2, 146:3, 146:6, 150:10, 167:14, 227:22, 230:21, 230:23, 241:13, 259:15, 263:25, 264:20</p> <p>looks [4] - 124:10, 156:23, 240:8,</p>
	K	<p>laid [1] - 213:17</p> <p>lake [2] - 195:4, 195:12</p> <p>land [9] - 210:9, 247:24, 248:4, 248:5, 256:11, 264:18, 264:21, 265:8, 265:12</p> <p>Landowners [1] - 124:1</p> <p>lands [1] - 237:9</p> <p>landscape [2] - 149:22, 172:23</p> <p>lane [1] - 253:6</p> <p>laptop [1] - 268:18</p> <p>large [11] - 135:25, 138:15, 158:16, 159:23, 166:25, 173:17, 191:18, 192:2, 192:15, 201:2, 223:16</p> <p>larger [6] - 136:6, 158:17, 175:8, 192:9, 204:16, 263:23</p> <p>last [4] - 146:18, 155:3, 214:15, 261:3</p> <p>late [3] - 232:15, 260:8, 264:25</p> <p>latitude [1] - 202:6</p> <p>Laura [1] - 123:11</p> <p>law [1] - 256:17</p> <p>layman's [1] - 263:3</p> <p>lead [2] - 200:23, 201:21</p> <p>leading [1] - 199:20</p> <p>least [3] - 124:14, 175:5</p> <p>leave [5] - 173:18, 183:18, 257:18, 257:20, 269:4</p> <p>led [1] - 180:23</p> <p>left [5] - 178:15, 187:20, 253:6, 264:25, 269:8</p> <p>left-hand [1] - 253:6</p> <p>length [5] - 158:3, 249:6, 249:7, 258:20, 266:19</p> <p>less [4] - 136:11, 136:14, 175:6,</p>	L	
<p>Kaminski [1] - 123:14</p> <p>Kamp [3] - 196:22, 197:5, 197:7</p> <p>Kananaskis [1] - 199:2</p> <p>keenly [1] - 197:20</p> <p>keep [2] - 239:19, 265:3</p> <p>keeping [1] - 267:22</p> <p>Kennedy [4] - 123:10, 214:4, 214:10, 214:14</p> <p>KENNEDY [1] - 214:3</p> <p>Kensington [1] - 147:1</p> <p>key [2] - 187:4, 224:4</p> <p>kicking [1] - 125:14</p> <p>kilometre [2] - 246:15, 248:13</p> <p>kilometres [8] - 151:21, 151:25, 152:10, 158:23, 244:12, 244:16, 244:19, 266:11</p> <p>kind [12] - 138:7, 158:4, 159:21, 167:21, 223:22, 241:22, 241:23, 247:14, 247:16, 247:17, 247:20, 268:3</p> <p>Kiwanis [3] - 196:22, 197:5, 197:7</p> <p>knocked [1] - 168:17</p>				

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>264:24 loose [1] - 267:11 Lorelee [3] - 124:5, 270:10, 270:11 lose [1] - 191:17 loss [2] - 195:18, 196:11 losses [1] - 196:18 lost [5] - 176:10, 190:12, 190:23, 191:14, 239:2 Louden [1] - 123:23 low [13] - 145:20, 210:18, 226:1, 226:3, 227:11, 227:21, 239:19, 240:5, 240:20, 248:23, 249:1, 249:5, 249:18 low-level [10] - 226:1, 226:3, 227:11, 227:21, 240:5, 240:20, 248:23, 249:1, 249:5, 249:18 lower [3] - 159:24, 250:18, 262:11 lowering [2] - 204:4, 264:4 Ltd [2] - 124:3, 124:3 Luigi [1] - 123:20 lunch [1] - 244:7</p>	<p>215:17, 215:18, 228:1, 229:6 manager's [1] - 156:15 managing [1] - 165:6 mandate [1] - 239:22 manner [2] - 182:6, 206:16 manual [1] - 201:21 map [1] - 147:25 mapping [5] - 138:6, 161:16, 172:6, 210:10, 234:6 maps [10] - 144:6, 144:8, 144:10, 146:21, 160:4, 160:12, 160:15, 160:21, 210:11, 210:12 March [5] - 122:20, 123:5, 200:13, 260:22, 270:9 MARCH [1] - 269:22 margin [1] - 163:8 marginally [1] - 233:20 Mark [1] - 212:4 marked [1] - 213:3 market [2] - 230:3, 230:19 Mary [1] - 197:18 mask [1] - 254:21 material [4] - 130:17, 211:1, 211:5, 247:21 materially [1] - 181:20 materials [3] - 129:4, 225:7, 262:6 math [1] - 133:4 Matt [5] - 128:16, 142:3, 167:15, 176:9, 184:22 matters [1] - 208:11 Matthew [1] - 140:8 max [1] - 171:3 maximum [19] - 125:12, 129:15, 130:15, 131:1, 131:15, 132:9, 132:12, 132:21, 133:14, 164:25, 172:11, 172:14, 172:22, 173:1, 177:3, 177:7, 177:8, 181:6 MC [1] - 177:15 MC1 [105] - 125:4, 127:21, 128:21, 131:9, 131:11, 131:13, 131:14, 131:21, 132:13,</p>	<p>132:18, 133:1, 133:13, 134:4, 134:19, 134:24, 135:3, 136:22, 136:23, 136:24, 138:9, 138:13, 138:14, 138:19, 139:25, 140:13, 140:16, 142:24, 153:2, 153:15, 156:4, 156:5, 157:10, 157:12, 159:6, 160:24, 161:8, 162:10, 162:11, 164:5, 164:6, 164:9, 164:20, 165:7, 165:10, 165:20, 165:23, 166:1, 166:13, 167:9, 167:16, 167:20, 172:22, 172:11, 173:21, 180:10, 181:18, 182:8, 183:7, 183:10, 186:10, 186:24, 192:10, 192:15, 192:23, 193:2, 193:6, 193:12, 194:3, 194:6, 195:3, 195:12, 196:6, 196:15, 196:18, 197:22, 198:4, 198:12, 198:21, 198:23, 199:7, 199:13, 199:15, 204:7, 204:18, 205:10, 206:22, 207:17, 211:21, 212:2, 212:15, 213:22, 232:22, 233:7, 233:10, 233:18, 233:24, 235:9, 235:11, 238:25, 239:3, 239:12, 244:10, 244:18 MC1's [1] - 204:19 McLean [13] - 133:22, 136:10, 139:13, 144:16, 158:18, 159:5, 159:6, 164:5, 193:18, 196:3, 212:15, 237:25, 251:15 Meadows [19] - 139:8, 139:24, 140:12, 144:3, 155:6, 158:19, 190:12, 190:23, 191:16, 193:13, 193:22,</p>	<p>232:25, 233:21, 235:9, 235:18, 235:25, 237:5, 237:8, 237:10 mean [21] - 126:12, 133:16, 135:9, 138:3, 155:22, 168:10, 175:15, 175:16, 199:16, 200:7, 209:1, 221:10, 223:18, 249:25, 256:21, 263:3, 263:10, 263:21, 265:7, 267:1 meaning [1] - 191:14 means [6] - 133:20, 159:15, 210:4, 263:5, 263:7, 265:16 meant [1] - 132:17 meanwhile [1] - 178:8 measure [5] - 169:4, 169:6, 244:11, 244:16, 248:6 measured [4] - 169:3, 169:22, 246:24, 247:2 measurement [2] - 245:17, 248:1 measures [4] - 155:4, 175:22, 177:17, 177:19 meet [2] - 170:5, 215:1 meeting [1] - 183:16 meetings [1] - 209:7 Melissa [1] - 123:18 Member [3] - 123:8, 123:8, 123:9 Memo [1] - 226:1 memo [5] - 195:24, 217:12, 218:24, 220:8, 222:11 memorandum [1] - 187:7 menninger [1] - 159:13 Menninger [18] - 157:7, 161:7, 167:18, 169:17, 173:24, 176:11, 218:12, 225:18, 228:4, 240:11, 240:23, 242:1, 243:9, 245:7, 248:18, 262:9, 266:4, 266:16 MENNINGER [99] - 124:21, 157:8, 159:15, 160:1, 160:7, 160:13, 160:16, 160:25,</p>	<p>162:20, 163:12, 163:15, 164:8, 165:8, 165:16, 166:8, 166:17, 166:19, 166:21, 166:23, 167:2, 167:6, 168:3, 168:15, 168:20, 168:25, 169:19, 170:19, 171:17, 172:2, 172:13, 172:17, 172:21, 174:2, 174:5, 174:10, 174:19, 176:12, 176:18, 176:23, 177:2, 177:5, 218:13, 218:22, 219:17, 219:24, 221:2, 221:5, 221:10, 221:13, 223:15, 224:16, 224:19, 225:2, 225:4, 225:22, 225:24, 227:8, 227:17, 227:19, 227:25, 228:20, 229:19, 230:11, 230:16, 231:5, 240:13, 242:25, 243:10, 245:8, 245:12, 245:14, 245:19, 245:21, 246:1, 246:8, 246:12, 247:8, 247:10, 248:1, 248:6, 248:22, 248:25, 249:2, 249:15, 249:20, 250:3, 251:10, 252:4, 252:16, 261:9, 262:10, 262:20, 263:5, 263:7, 263:13, 263:15, 263:20, 266:17, 271:7 Menninger's [2] - 176:16, 241:13 mention [3] - 126:17, 196:22, 241:8 mentioned [11] - 157:20, 172:7, 173:1, 178:11, 178:18, 180:15, 180:18, 189:2, 198:17, 200:2, 236:8 mentions [1] - 189:1 Mercer [1] - 123:19 message [1] - 216:8 meteorologist [1] -</p>
M				
<p>Madam [1] - 214:4 main [1] - 146:21 maintained [1] - 154:6 maintenance [1] - 227:3 major [4] - 189:21, 198:14, 217:20, 259:13 Major [1] - 185:17 majority [5] - 174:16, 201:2, 211:5, 245:21, 256:13 manage [2] - 187:21, 193:11 management [10] - 151:8, 152:24, 187:13, 189:11, 193:6, 205:11, 207:2, 217:24, 267:19 manager [15] - 127:12, 127:15, 131:20, 151:9, 162:8, 162:14, 167:4, 185:20, 185:22, 187:24, 194:4,</p>	<p>132:18, 133:1, 133:13, 134:4, 134:19, 134:24, 135:3, 136:22, 136:23, 136:24, 138:9, 138:13, 138:14, 138:19, 139:25, 140:13, 140:16, 142:24, 153:2, 153:15, 156:4, 156:5, 157:10, 157:12, 159:6, 160:24, 161:8, 162:10, 162:11, 164:5, 164:6, 164:9, 164:20, 165:7, 165:10, 165:20, 165:23, 166:1, 166:13, 167:9, 167:16, 167:20, 172:22, 172:11, 173:21, 180:10, 181:18, 182:8, 183:7, 183:10, 186:10, 186:24, 192:10, 192:15, 192:23, 193:2, 193:6, 193:12, 194:3, 194:6, 195:3, 195:12, 196:6, 196:15, 196:18, 197:22, 198:4, 198:12, 198:21, 198:23, 199:7, 199:13, 199:15, 204:7, 204:18, 205:10, 206:22, 207:17, 211:21, 212:2, 212:15, 213:22, 232:22, 233:7, 233:10, 233:18, 233:24, 235:9, 235:11, 238:25, 239:3, 239:12, 244:10, 244:18 MC1's [1] - 204:19 McLean [13] - 133:22, 136:10, 139:13, 144:16, 158:18, 159:5, 159:6, 164:5, 193:18, 196:3, 212:15, 237:25, 251:15 Meadows [19] - 139:8, 139:24, 140:12, 144:3, 155:6, 158:19, 190:12, 190:23, 191:16, 193:13, 193:22,</p>	<p>232:25, 233:21, 235:9, 235:18, 235:25, 237:5, 237:8, 237:10 mean [21] - 126:12, 133:16, 135:9, 138:3, 155:22, 168:10, 175:15, 175:16, 199:16, 200:7, 209:1, 221:10, 223:18, 249:25, 256:21, 263:3, 263:10, 263:21, 265:7, 267:1 meaning [1] - 191:14 means [6] - 133:20, 159:15, 210:4, 263:5, 263:7, 265:16 meant [1] - 132:17 meanwhile [1] - 178:8 measure [5] - 169:4, 169:6, 244:11, 244:16, 248:6 measured [4] - 169:3, 169:22, 246:24, 247:2 measurement [2] - 245:17, 248:1 measures [4] - 155:4, 175:22, 177:17, 177:19 meet [2] - 170:5, 215:1 meeting [1] - 183:16 meetings [1] - 209:7 Melissa [1] - 123:18 Member [3] - 123:8, 123:8, 123:9 Memo [1] - 226:1 memo [5] - 195:24, 217:12, 218:24, 220:8, 222:11 memorandum [1] - 187:7 menninger [1] - 159:13 Menninger [18] - 157:7, 161:7, 167:18, 169:17, 173:24, 176:11, 218:12, 225:18, 228:4, 240:11, 240:23, 242:1, 243:9, 245:7, 248:18, 262:9, 266:4, 266:16 MENNINGER [99] - 124:21, 157:8, 159:15, 160:1, 160:7, 160:13, 160:16, 160:25,</p>	<p>162:20, 163:12, 163:15, 164:8, 165:8, 165:16, 166:8, 166:17, 166:19, 166:21, 166:23, 167:2, 167:6, 168:3, 168:15, 168:20, 168:25, 169:19, 170:19, 171:17, 172:2, 172:13, 172:17, 172:21, 174:2, 174:5, 174:10, 174:19, 176:12, 176:18, 176:23, 177:2, 177:5, 218:13, 218:22, 219:17, 219:24, 221:2, 221:5, 221:10, 221:13, 223:15, 224:16, 224:19, 225:2, 225:4, 225:22, 225:24, 227:8, 227:17, 227:19, 227:25, 228:20, 229:19, 230:11, 230:16, 231:5, 240:13, 242:25, 243:10, 245:8, 245:12, 245:14, 245:19, 245:21, 246:1, 246:8, 246:12, 247:8, 247:10, 248:1, 248:6, 248:22, 248:25, 249:2, 249:15, 249:20, 250:3, 251:10, 252:4, 252:16, 261:9, 262:10, 262:20, 263:5, 263:7, 263:13, 263:15, 263:20, 266:17, 271:7 Menninger's [2] - 176:16, 241:13 mention [3] - 126:17, 196:22, 241:8 mentioned [11] - 157:20, 172:7, 173:1, 178:11, 178:18, 180:15, 180:18, 189:2, 198:17, 200:2, 236:8 mentions [1] - 189:1 Mercer [1] - 123:19 message [1] - 216:8 meteorologist [1] -</p>	

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>246:12 metre [5] - 182:7, 252:10, 266:12, 266:13, 266:21 metres [88] - 128:6, 128:22, 128:23, 129:6, 129:11, 129:16, 130:15, 130:17, 130:22, 131:2, 131:6, 131:10, 132:13, 132:22, 132:23, 134:5, 134:9, 134:10, 134:22, 135:1, 135:5, 135:7, 135:9, 135:10, 135:14, 135:15, 135:20, 136:25, 137:3, 137:4, 137:5, 137:15, 137:16, 137:17, 138:3, 138:11, 138:23, 138:24, 139:6, 139:16, 140:22, 140:23, 140:24, 140:25, 141:10, 141:11, 143:2, 144:1, 144:18, 144:24, 145:5, 145:8, 147:22, 147:23, 149:7, 154:16, 157:13, 157:21, 157:23, 164:17, 165:11, 165:12, 165:13, 167:17, 171:3, 180:16, 181:19, 181:20, 182:9, 190:11, 207:11, 208:2, 222:17, 222:25, 224:5, 226:13, 240:3, 240:9, 240:18, 249:13, 252:5, 252:6, 252:7, 266:10, 266:19 mic [9] - 215:22, 216:6, 253:11, 268:1, 268:10, 268:11, 268:14, 268:17, 268:21 Michael [2] - 123:12, 123:17 mics [1] - 217:18 mid [1] - 260:8 midway [1] - 226:16 might [7] - 125:1, 140:15, 152:18, 180:21, 221:11, 264:19, 268:16</p>	<p>million [23] - 128:13, 155:10, 155:12, 155:18, 156:5, 156:7, 156:8, 156:9, 165:2, 169:16, 170:7, 173:3, 186:18, 225:11, 225:12, 232:23, 233:22, 240:2, 240:17, 241:14, 250:18, 266:15 million-year [1] - 165:2 millions [1] - 193:12 mind [2] - 181:23, 187:13 minimum [2] - 164:3, 180:16 Ministry [1] - 188:22 minute [3] - 185:2, 216:18, 253:3 minutes [2] - 242:20, 269:5 mischaracterizing [1] - 134:18 misplaced [1] - 172:19 missed [1] - 240:15 missing [1] - 264:15 Mission [1] - 149:13 misspoke [1] - 164:8 mitigate [2] - 192:7, 219:11 mitigated [1] - 194:24 mitigates [1] - 150:9 mitigating [1] - 198:20 mitigation [39] - 132:2, 139:12, 140:6, 140:9, 140:12, 142:6, 142:11, 143:16, 143:19, 143:23, 147:13, 147:15, 152:22, 178:2, 183:2, 184:6, 184:13, 188:5, 189:11, 192:22, 198:5, 200:5, 204:12, 204:25, 206:7, 206:14, 207:20, 207:24, 208:5, 208:15, 211:22, 211:23, 220:13, 221:24, 235:14, 236:20, 237:4, 238:23, 243:4 mitigations [5] - 150:11, 180:9, 194:25, 195:2, 209:5 mixed [1] - 247:17</p>	<p>MNP [3] - 123:15, 185:12, 269:19 model [10] - 131:24, 170:1, 170:20, 246:19, 246:24, 247:5, 247:9, 247:22, 247:23, 248:16 modeled [1] - 252:10 modelled [1] - 233:15 modelling [1] - 161:17 models [3] - 169:20, 169:23, 170:16 moment [21] - 142:17, 143:15, 147:8, 153:20, 153:21, 154:4, 156:12, 158:22, 159:7, 161:4, 161:12, 177:23, 178:16, 195:8, 211:16, 235:5, 239:21, 249:6, 253:8, 259:10 money [1] - 230:21 monitor [1] - 224:8 Montgomery [1] - 146:25 Moose [3] - 196:23, 197:9, 197:13 morning [13] - 127:16, 147:16, 151:6, 206:12, 207:2, 216:25, 231:19, 241:24, 265:10, 265:17, 267:24, 269:14, 269:18 most [10] - 153:11, 156:1, 181:2, 199:2, 206:16, 247:11, 248:20, 256:11, 256:12, 268:5 mountains [4] - 186:11, 192:15, 247:11, 247:13 move [4] - 203:9, 214:9, 215:7, 269:13 moved [3] - 171:24, 260:11, 260:17 movement [1] - 219:12 moves [1] - 230:6 moving [4] - 203:12, 256:22, 256:24, 257:8 MR [395] - 124:18, 124:23, 125:7, 125:11, 125:13, 125:17, 125:20, 126:10, 126:17, 127:4, 127:14,</p>	<p>127:20, 127:25, 128:8, 128:13, 128:16, 128:18, 128:20, 128:25, 129:8, 129:13, 129:22, 130:8, 130:12, 131:8, 131:11, 131:17, 132:10, 132:16, 132:25, 133:4, 133:19, 134:2, 134:11, 134:23, 135:3, 135:12, 135:17, 135:23, 136:6, 136:12, 136:16, 137:7, 137:13, 137:25, 138:12, 138:25, 139:10, 139:19, 140:3, 140:7, 140:15, 141:8, 141:15, 141:22, 141:23, 142:2, 142:10, 142:17, 142:19, 143:13, 144:9, 144:15, 144:21, 145:1, 145:7, 145:17, 145:25, 146:8, 146:14, 146:17, 147:10, 147:19, 148:8, 148:25, 149:3, 149:15, 150:8, 150:12, 151:2, 151:16, 151:23, 152:3, 152:7, 152:11, 152:15, 152:21, 153:7, 153:20, 154:4, 154:12, 154:20, 155:21, 156:11, 156:18, 156:21, 156:25, 157:2, 157:6, 157:8, 158:13, 158:20, 159:1, 159:7, 159:12, 159:15, 160:1, 160:7, 160:13, 160:16, 160:25, 161:4, 161:12, 161:14, 162:3, 162:10, 162:13, 162:14, 162:16, 162:20, 163:12, 163:15, 164:8, 165:8, 165:16, 166:8, 166:17, 166:19, 166:21, 166:23, 167:2, 167:3, 167:6, 167:12, 168:3,</p>	<p>168:15, 168:20, 168:25, 169:19, 170:19, 171:17, 172:2, 172:4, 172:13, 172:17, 172:21, 174:2, 174:5, 174:10, 174:19, 174:24, 175:2, 175:9, 176:9, 176:12, 176:15, 176:18, 176:23, 177:2, 177:5, 178:16, 178:20, 178:24, 180:5, 180:7, 180:21, 180:25, 181:21, 182:11, 183:4, 183:11, 184:3, 184:17, 184:22, 185:4, 185:7, 185:15, 186:1, 186:6, 187:1, 187:3, 187:24, 188:3, 189:8, 189:14, 189:25, 190:5, 190:25, 191:7, 192:11, 192:24, 193:16, 194:13, 195:8, 195:10, 195:15, 195:24, 196:7, 196:9, 197:1, 197:14, 197:24, 198:10, 198:24, 199:18, 200:9, 201:9, 201:10, 202:4, 202:14, 202:24, 202:25, 203:1, 203:2, 203:3, 203:4, 203:5, 203:6, 203:8, 203:9, 203:11, 203:13, 203:15, 203:17, 204:1, 204:12, 204:21, 206:4, 207:18, 208:6, 208:10, 208:23, 209:12, 210:23, 210:25, 211:11, 211:16, 212:3, 212:11, 212:20, 212:25, 213:6, 214:3, 214:24, 215:6, 215:13, 215:15, 215:16, 215:25, 216:2, 216:6, 216:15, 216:18, 216:22, 217:6, 218:11, 218:13, 218:22, 219:17, 219:24, 221:2, 221:5,</p>
--	--	---	---	--

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>221:10, 221:13, 223:15, 224:16, 224:19, 225:2, 225:4, 225:22, 225:24, 227:8, 227:17, 227:19, 227:25, 228:20, 229:19, 230:11, 230:16, 231:5, 231:18, 232:5, 233:1, 233:2, 233:8, 233:11, 233:14, 233:20, 234:1, 234:6, 234:9, 234:12, 234:15, 234:18, 234:22, 234:25, 235:5, 235:13, 235:21, 236:2, 236:7, 236:12, 236:16, 236:17, 237:2, 237:7, 237:20, 237:23, 237:25, 238:8, 238:21, 239:1, 239:4, 239:13, 239:17, 239:19, 240:11, 240:13, 241:4, 241:11, 241:25, 242:5, 242:18, 242:25, 243:8, 243:10, 243:11, 243:14, 243:25, 244:6, 244:13, 244:14, 244:18, 244:20, 244:23, 245:1, 245:3, 245:8, 245:12, 245:14, 245:19, 245:21, 246:1, 246:8, 246:12, 247:8, 247:10, 248:1, 248:6, 248:22, 248:25, 249:2, 249:15, 249:20, 250:3, 251:10, 252:4, 252:16, 253:2, 253:8, 254:18, 254:19, 254:21, 255:3, 255:9, 259:20, 261:9, 262:10, 262:20, 263:5, 263:7, 263:13, 263:15, 263:20, 264:9, 264:18, 265:24, 266:4, 266:17, 267:4, 267:10, 268:6, 268:8, 268:12, 268:13, 268:14,</p>	<p>268:16, 268:19, 268:20, 268:24, 268:25, 269:1, 269:15, 269:20, 271:10 MS [30] - 232:8, 232:14, 232:18, 253:9, 253:17, 253:21, 254:5, 254:10, 254:13, 254:17, 255:15, 255:25, 256:8, 256:12, 256:24, 257:13, 257:20, 257:25, 258:7, 258:14, 258:22, 259:6, 259:10, 259:18, 259:22, 260:2, 260:6, 260:13, 260:18, 261:1 multistory [1] - 234:8 municipalities [5] - 143:18, 207:23, 208:12, 209:3, 209:5 municipality [2] - 143:17, 238:24 Munkitrick [1] - 123:19 must [7] - 138:14, 175:14, 191:19, 209:16, 210:2, 210:9, 242:25 mute [5] - 185:9, 216:2, 216:6, 216:7, 217:18 muted [1] - 215:19</p>	<p>nearly [1] - 152:13 necessarily [6] - 134:17, 138:1, 138:3, 155:22, 156:3, 230:18 necessary [9] - 130:18, 130:19, 164:15, 170:3, 170:4, 170:6, 170:15, 184:6, 224:11 need [21] - 124:13, 124:15, 156:25, 163:19, 178:22, 185:13, 193:10, 194:3, 194:4, 196:16, 203:6, 204:13, 208:4, 213:24, 241:21, 241:23, 242:12, 251:4, 257:21, 260:9 needed [9] - 130:9, 140:13, 143:19, 181:25, 190:11, 205:15, 209:6, 238:23, 253:24 needs [2] - 171:17, 213:24 negotiations [1] - 255:16 net [2] - 128:5, 156:23 new [12] - 188:13, 195:5, 195:14, 236:2, 256:20, 257:2, 257:10, 257:14, 258:2, 258:6, 260:24 next [3] - 129:25, 185:1, 229:11 nice [1] - 267:21 night [1] - 265:14 nobody [2] - 189:23 nobody's [1] - 190:3 noise [2] - 129:18, 217:17 nominal [3] - 251:21, 262:12, 264:6 none [1] - 147:8 Nora [1] - 123:14 Nora's [1] - 216:15 normally [1] - 218:4 north [1] - 146:25 notable [1] - 228:7 note [15] - 142:5, 144:23, 148:15, 148:18, 164:16, 179:17, 179:21, 180:8, 205:3, 205:7, 207:14, 225:14, 240:16, 258:8, 267:4</p>	<p>noted [3] - 151:6, 194:16, 205:9 notes [2] - 194:16, 270:6 nothing [4] - 139:9, 144:16, 198:14, 255:9 notion [1] - 153:23 NRCB [1] - 269:6 Number [8] - 127:13, 127:18, 127:19, 127:21, 136:20, 136:21, 136:23, 139:4 number [22] - 128:10, 128:12, 129:11, 147:14, 162:12, 162:19, 166:6, 166:15, 166:16, 166:22, 171:11, 196:21, 203:12, 203:18, 211:2, 214:8, 215:20, 215:23, 215:24, 217:7, 252:13, 267:3 numbered [1] - 243:16 numbers [14] - 129:13, 130:13, 139:1, 162:8, 168:18, 173:25, 174:11, 196:10, 202:2, 221:2, 263:20, 266:18 numerical [1] - 246:23</p>	<p>occurring [2] - 159:20, 160:19 occurs [1] - 201:2 October [2] - 185:18, 213:3 odd [1] - 198:13 odds [1] - 264:12 OFF [2] - 122:10, 216:17 off-stream [2] - 175:23, 222:11 OFF-STREAM [1] - 122:10 off-the-cuff [1] - 181:1 offer [1] - 268:8 offered [1] - 163:21 offhand [1] - 254:11 office [2] - 214:19, 214:21 Official [3] - 124:5, 270:12, 270:17 officials [1] - 189:16 often [2] - 170:23, 261:18 Okoye [1] - 124:1 once [6] - 153:16, 198:22, 212:5, 215:23, 257:14, 263:8 one [53] - 124:14, 124:15, 129:21, 142:17, 146:1, 146:3, 146:8, 146:9, 153:20, 154:4, 156:18, 158:2, 158:15, 158:22, 159:7, 161:4, 166:2, 171:12, 174:3, 177:7, 178:16, 187:8, 187:22, 192:10, 194:11, 195:8, 211:8, 211:16, 212:4, 214:12, 215:9, 216:12, 217:1, 224:4, 224:6, 234:7, 239:20, 244:18, 251:11, 253:8, 256:25, 258:1, 258:23, 258:24, 260:7, 262:2, 262:14, 265:18, 265:19, 266:1, 267:11, 267:25 ones [1] - 211:7 ongoing [1] - 219:3 online [1] - 210:11 onstream [1] - 186:10 open [1] - 160:7 operate [4] - 135:21,</p>
	N		O	
	<p>Nakoda [1] - 123:22 name [7] - 124:24, 126:17, 127:1, 189:18, 189:23, 190:3, 190:7 names [1] - 189:15 Nation [1] - 123:22 NATURAL [1] - 122:2 natural [6] - 178:4, 192:17, 198:18, 198:19, 228:13, 229:3 Natural [1] - 123:1 nature [9] - 139:18, 150:19, 193:25, 205:6, 206:11, 206:19, 206:20, 207:24, 213:20 near [4] - 138:2, 210:19, 211:12, 252:4</p>		<p>o'clock [2] - 124:11, 184:25 objective [3] - 154:14, 154:17, 206:13 objectives [1] - 151:7 objects [1] - 192:2 observations [1] - 168:22 observed [2] - 172:24, 174:6 obstruction [1] - 174:13 obtain [1] - 257:21 obvious [1] - 213:10 obviously [2] - 137:19, 193:1 occur [6] - 150:19, 180:8, 212:10, 232:3, 235:18, 263:8 occurred [6] - 138:16, 163:24, 166:13, 175:6, 198:9, 246:14 occurrence [1] - 173:2</p>	

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>135:22, 135:25, 157:11</p> <p>operated [2] - 135:23, 162:22</p> <p>operates [3] - 157:19, 189:24, 238:15</p> <p>operating [4] - 135:13, 135:19, 183:1, 205:10</p> <p>operation [4] - 164:10, 164:15, 176:1, 237:13</p> <p>operations [4] - 165:5, 186:13, 226:9, 227:3</p> <p>operator [3] - 226:8, 227:2, 238:10</p> <p>opinion [1] - 220:4, 230:2, 230:10, 230:14, 230:23, 231:20, 249:3, 259:8, 259:12, 259:16, 260:15</p> <p>opportunities [1] - 196:24</p> <p>opted [1] - 204:24</p> <p>optimization [1] - 205:24</p> <p>option [10] - 142:25, 158:18, 173:14, 180:10, 196:3, 198:4, 198:12, 199:7, 199:13, 206:22</p> <p>options [2] - 180:14, 207:3</p> <p>Opus [17] - 153:2, 161:24, 162:3, 182:8, 193:4, 194:2, 195:7, 204:18, 206:10, 210:20, 210:25, 211:14, 211:21, 212:6, 213:9, 213:11</p> <p>order [4] - 141:4, 173:2, 208:1, 266:15</p> <p>organization [2] - 180:24, 190:8</p> <p>origin [1] - 261:14</p> <p>original [3] - 189:4, 207:16, 231:7</p> <p>originally [1] - 178:9</p> <p>otherwise [2] - 216:13, 251:1</p> <p>outcome [2] - 194:12, 211:23</p> <p>outcomes [3] - 154:9, 165:15, 211:22</p> <p>outcrops [1] - 247:10</p> <p>outflow [7] - 131:5, 131:9, 133:13,</p>	<p>133:18, 160:23, 161:8, 164:17</p> <p>outlet [18] - 131:6, 133:5, 133:25, 134:8, 134:12, 134:25, 226:1, 226:4, 227:9, 227:11, 227:21, 240:6, 240:20, 248:23, 249:1, 249:5, 249:7, 249:18</p> <p>outline [1] - 188:22</p> <p>overall [4] - 165:6, 248:15, 259:7, 267:19</p> <p>overland [1] - 149:24</p> <p>overriding [1] - 126:8</p> <p>oversimplification [1] - 196:25</p> <p>overtop [2] - 181:7</p> <p>own [2] - 177:25, 178:1</p> <p>owns [1] - 238:15</p>	<p>127:15, 128:1, 130:6, 148:11, 148:15, 150:14, 154:13, 160:8, 169:15, 172:3, 182:12, 188:7, 195:25, 199:1, 241:18, 241:22, 242:11, 242:23, 259:21, 264:20, 265:23, 267:9, 267:20, 269:4, 269:6, 269:14</p> <p>Panel's [1] - 234:5</p> <p>par [3] - 155:1, 183:15, 183:23</p> <p>paragraph [7] - 153:8, 155:3, 218:23, 221:1, 222:10, 225:25, 228:4</p> <p>pardon [1] - 258:23</p> <p>Park [4] - 148:5, 148:6, 149:12, 149:13</p> <p>park [1] - 198:22</p> <p>parking [4] - 197:21, 237:15, 238:2, 247:6</p> <p>Parks [9] - 135:24, 147:17, 148:19, 161:21, 179:15, 188:22, 189:10, 189:17, 228:14</p> <p>Parks' [1] - 185:16</p> <p>part [22] - 142:23, 149:1, 160:4, 161:18, 179:7, 181:3, 187:18, 205:23, 209:2, 209:25, 228:22, 230:2, 230:5, 230:7, 236:19, 237:9, 243:4, 251:4, 251:6, 252:14, 256:11, 256:12</p> <p>particles [1] - 191:18</p> <p>particular [7] - 173:14, 183:3, 188:21, 194:17, 207:22, 255:1, 263:25</p> <p>particularly [2] - 138:6, 143:16</p> <p>parts [2] - 147:2, 210:6</p> <p>party [2] - 188:17, 188:18</p> <p>pass [17] - 132:23, 133:17, 135:9, 135:14, 157:10, 157:16, 157:22, 158:7, 158:9,</p>	<p>158:12, 159:23, 172:14, 172:15, 173:10, 173:23, 251:20</p> <p>passage [6] - 164:14, 219:2, 219:10, 219:16, 219:20, 220:7</p> <p>Passage [1] - 218:25</p> <p>passes [4] - 152:1, 157:12, 157:24, 164:22</p> <p>passing [5] - 133:2, 137:5, 137:17, 141:11, 145:4</p> <p>past [5] - 132:24, 135:10, 135:15, 205:25, 224:16</p> <p>pathways [2] - 237:15, 238:2</p> <p>patience [2] - 217:3, 235:6</p> <p>pay [2] - 236:25, 239:10</p> <p>payment [1] - 255:22</p> <p>PDF [27] - 129:10, 146:12, 146:15, 146:18, 153:1, 153:3, 153:8, 156:19, 166:12, 166:24, 175:21, 187:25, 189:1, 204:18, 205:8, 216:1, 216:16, 218:7, 218:9, 219:14, 220:24, 224:15, 227:5, 229:6, 229:9, 240:3, 241:3</p> <p>pdf [4] - 161:25, 162:3, 178:20, 178:22</p> <p>PDR [11] - 192:3, 217:11, 217:15, 217:21, 218:23, 219:22, 220:7, 222:10, 225:23, 226:1, 228:9</p> <p>peak [33] - 132:23, 133:5, 133:6, 133:7, 133:15, 134:1, 134:8, 134:13, 134:14, 134:21, 135:1, 136:6, 137:5, 137:16, 139:16, 140:23, 144:1, 145:8, 147:23, 156:1, 157:24, 158:3, 159:20, 160:18, 160:20,</p>	<p>160:22, 164:19, 164:21, 165:21, 181:2, 181:6, 181:10</p> <p>pending [1] - 139:20</p> <p>people [4] - 129:18, 129:20, 141:1, 217:17</p> <p>per [63] - 129:6, 129:11, 130:15, 130:17, 130:22, 131:3, 131:6, 131:10, 132:13, 132:22, 134:5, 134:9, 134:10, 134:22, 135:2, 135:5, 135:7, 135:9, 135:10, 135:14, 135:15, 135:20, 136:25, 137:3, 137:4, 137:6, 137:15, 137:16, 137:17, 138:3, 138:11, 138:23, 138:24, 139:6, 139:16, 140:22, 140:23, 140:24, 140:25, 141:10, 143:2, 144:1, 144:18, 144:24, 145:5, 145:8, 147:22, 147:23, 149:8, 154:17, 157:13, 157:21, 157:23, 164:17, 165:11, 165:12, 171:3, 181:19, 181:20, 182:7, 182:9, 207:11, 208:2</p> <p>percent [25] - 128:9, 130:24, 151:14, 152:13, 156:5, 158:5, 163:22, 165:3, 169:18, 170:9, 170:17, 170:20, 171:4, 174:15, 187:9, 199:22, 199:25, 200:18, 201:5, 201:23, 245:9, 246:6, 247:12, 248:14</p> <p>perfect [4] - 127:23, 228:3, 242:20, 243:21</p> <p>perform [1] - 248:15</p> <p>performance [6] - 132:1, 135:6, 138:20, 142:20, 154:10, 166:5</p> <p>performed [6] - 154:2,</p>
	P			
	<p>p.m [1] - 124:8</p> <p>package [2] - 166:10, 232:10</p> <p>Paddys [2] - 198:6, 198:11</p> <p>page [49] - 129:10, 131:22, 146:12, 146:15, 146:18, 153:1, 153:3, 153:8, 156:19, 161:25, 162:4, 162:8, 166:12, 166:24, 175:21, 178:19, 178:21, 188:1, 189:1, 189:5, 194:2, 194:3, 196:14, 196:15, 199:14, 204:18, 205:8, 206:5, 215:20, 215:23, 215:24, 218:7, 219:14, 220:24, 224:15, 224:17, 227:5, 229:7, 229:8, 229:9, 229:11, 229:14, 240:4, 241:3, 253:1, 253:4</p> <p>page.. [1] - 156:20</p> <p>pages [4] - 187:14, 217:7, 229:15, 270:4</p> <p>panel [3] - 127:17, 153:22, 244:4</p> <p>PANEL [2] - 124:23, 271:10</p> <p>Panel [27] - 125:5,</p>			

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>161:2, 161:9, 223:7, 223:10, 250:6</p> <p>perhaps [14] - 126:5, 126:21, 126:25, 159:9, 182:11, 186:22, 201:17, 201:23, 214:18, 251:12, 257:7, 257:25, 261:3, 264:22</p> <p>period [20] - 157:15, 158:1, 158:6, 174:12, 205:18, 224:22, 245:13, 245:15, 245:17, 245:20, 245:22, 245:23, 261:20, 262:7, 262:9, 262:22, 264:1, 264:6</p> <p>periods [2] - 160:10, 261:21</p> <p>permanent [4] - 193:5, 205:12, 205:16, 205:22</p> <p>permutations [1] - 181:14</p> <p>PERRET [2] - 124:21, 271:8</p> <p>pertained [1] - 148:16</p> <p>pertains [2] - 196:2, 197:9</p> <p>Peter [1] - 123:7</p> <p>phone [2] - 127:5, 269:8</p> <p>phonetic [1] - 225:19</p> <p>physically [1] - 246:23</p> <p>pick [1] - 146:1</p> <p>picnic [1] - 198:8</p> <p>picture [1] - 167:21</p> <p>piece [3] - 157:17, 192:1, 192:25</p> <p>pieces [4] - 239:14, 239:20, 253:23, 253:24</p> <p>pinpoint [1] - 225:7</p> <p>pipe [2] - 257:10</p> <p>pipeline [28] - 255:11, 255:13, 255:15, 255:17, 255:20, 256:3, 256:7, 256:17, 256:21, 256:25, 257:9, 257:15, 257:16, 257:23, 258:1, 258:8, 258:16, 258:18, 258:23, 258:24, 259:4, 259:6, 259:23, 260:6, 260:7, 260:15, 260:25,</p>	<p>261:2</p> <p>pipelines [13] - 255:11, 255:20, 255:24, 256:10, 256:13, 256:16, 256:22, 257:1, 257:14, 257:15, 258:19, 258:25, 259:14</p> <p>place [3] - 143:19, 191:1, 195:2</p> <p>placed [1] - 206:14</p> <p>planned [3] - 164:15, 241:7, 252:25</p> <p>planning [1] - 231:23</p> <p>plans [1] - 209:2</p> <p>plant [1] - 152:6</p> <p>Plant [2] - 152:13, 152:19</p> <p>plateau [1] - 158:4</p> <p>play [1] - 196:1</p> <p>plays [2] - 159:18, 160:17</p> <p>plug [1] - 268:10</p> <p>plug-in [1] - 268:10</p> <p>plus [2] - 169:18, 183:9</p> <p>PMF [15] - 125:12, 131:15, 132:8, 132:14, 133:8, 133:17, 134:6, 134:19, 162:12, 164:22, 172:16, 173:8, 191:5, 191:9</p> <p>point [25] - 133:1, 165:16, 170:24, 171:14, 171:16, 171:20, 173:7, 188:7, 188:11, 193:4, 196:19, 201:14, 207:1, 209:16, 209:23, 210:9, 229:19, 231:16, 232:3, 232:11, 243:17, 258:11, 259:5, 261:15, 262:3</p> <p>pointed [3] - 134:16, 136:7, 167:15</p> <p>points [2] - 196:17, 207:21</p> <p>poking [1] - 191:20</p> <p>policy [1] - 210:11</p> <p>politicians [3] - 142:10, 142:12, 143:6</p> <p>Pond [2] - 197:22, 197:25</p> <p>pond [3] - 193:5, 193:10, 198:12</p>	<p>pondering [1] - 185:1</p> <p>pool [3] - 205:22, 261:25, 262:12</p> <p>population [1] - 151:1</p> <p>populations [1] - 194:9</p> <p>portion [2] - 168:17, 251:24</p> <p>portions [1] - 165:24</p> <p>posed [1] - 199:9</p> <p>position [2] - 193:24, 206:13</p> <p>positive [1] - 194:12</p> <p>possible [12] - 125:12, 148:25, 150:18, 175:25, 176:5, 183:9, 197:2, 204:11, 206:16, 230:9, 241:21, 251:17</p> <p>post [2] - 234:3, 235:16</p> <p>post-flood [1] - 235:16</p> <p>post-SR1 [1] - 234:3</p> <p>potential [14] - 180:13, 197:3, 197:5, 199:23, 200:5, 200:23, 201:21, 203:23, 204:16, 205:5, 206:12, 219:11, 226:23, 249:11</p> <p>potentially [3] - 200:24, 201:22, 269:5</p> <p>potentials [1] - 170:13</p> <p>practicing [1] - 256:17</p> <p>pre [2] - 162:6, 175:12</p> <p>pre-loaded [1] - 162:6</p> <p>pre-record [1] - 175:12</p> <p>precipitation [1] - 168:6</p> <p>precise [3] - 143:14, 159:8, 159:9</p> <p>predominantly [1] - 259:2</p> <p>prefer [4] - 158:20, 158:21, 159:1, 159:8</p> <p>preliminary [4] - 205:9, 217:21, 227:23, 228:22</p> <p>Preliminary [14] - 218:2, 218:21, 219:4, 220:15, 222:21, 226:11, 228:8, 229:25, 230:7, 231:1, 232:17, 250:10,</p>	<p>250:16, 251:22</p> <p>premature [1] - 186:15</p> <p>prepared [2] - 187:1, 189:9</p> <p>present [3] - 175:17, 183:6, 259:9</p> <p>presented [2] - 164:20, 235:15</p> <p>pressure [1] - 223:23</p> <p>pressures [2] - 224:2, 224:9</p> <p>presumably [1] - 258:3</p> <p>pretty [5] - 124:11, 149:3, 217:2, 267:17, 267:20</p> <p>prevent [3] - 198:21, 221:24, 249:11</p> <p>preventing [1] - 218:1</p> <p>previous [1] - 193:4</p> <p>previously [2] - 124:22, 227:15</p> <p>primarily [3] - 205:11, 222:1, 227:12</p> <p>primary [4] - 168:11, 221:16, 221:22, 224:19</p> <p>Prince [1] - 147:1</p> <p>private [2] - 198:13, 256:11</p> <p>probability [1] - 140:17</p> <p>probable [13] - 131:15, 132:9, 132:12, 132:21, 133:14, 164:25, 172:11, 172:14, 172:22, 173:1, 177:3, 177:6, 177:8</p> <p>problem [8] - 127:5, 145:19, 168:13, 192:10, 192:14, 214:16, 268:25, 269:20</p> <p>problems [1] - 210:18</p> <p>proceed [11] - 157:5, 179:3, 179:4, 185:23, 186:3, 196:18, 199:13, 204:24, 214:22, 247:13, 255:2</p> <p>proceeded [1] - 199:7</p> <p>Proceedings [2] - 123:1, 124:8</p> <p>proceedings [3] - 214:9, 238:22, 270:5</p> <p>PROCEEDINGS [1] - 269:22</p> <p>process [8] - 148:19, 155:6, 178:5, 187:5,</p>	<p>205:6, 229:2, 232:2, 255:19</p> <p>processes [1] - 198:18</p> <p>produced [1] - 248:16</p> <p>program [1] - 239:19</p> <p>progress [2] - 205:5, 206:7</p> <p>Project [1] - 186:8</p> <p>project [81] - 125:23, 127:8, 140:11, 147:9, 147:18, 148:21, 150:9, 152:21, 152:22, 152:23, 154:10, 154:14, 154:18, 158:16, 158:24, 162:24, 168:6, 170:9, 173:13, 179:13, 179:15, 179:17, 180:23, 181:22, 182:4, 182:18, 182:20, 184:12, 186:18, 188:6, 188:8, 188:25, 190:9, 193:21, 196:18, 197:5, 197:18, 200:3, 204:12, 204:25, 205:4, 205:5, 205:22, 205:25, 206:7, 206:9, 206:19, 207:4, 208:25, 211:12, 213:13, 213:14, 213:19, 217:20, 219:2, 219:11, 221:15, 224:4, 225:12, 228:24, 229:2, 229:20, 230:6, 230:10, 230:25, 231:3, 231:8, 231:16, 231:19, 231:23, 231:24, 232:6, 236:18, 238:1, 243:6, 253:14, 253:22, 258:9, 259:1, 259:7</p> <p>PROJECT [1] - 122:10</p> <p>project's [1] - 205:15</p> <p>projection [1] - 170:18</p> <p>projections [1] - 203:19</p> <p>projects [20] - 140:10, 153:24, 154:22, 154:23, 160:2, 179:22, 179:23, 182:1, 182:14,</p>
---	---	--	--	---

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

182:23, 183:13, 183:21, 189:11, 196:11, 206:23, 236:18, 236:20, 236:21, 236:23, 238:9 properly [1] - 194:24 properties [4] - 138:2, 198:25, 207:15, 210:4 property [3] - 197:11, 197:15, 197:19 proponent [7] - 179:14, 198:21, 201:7, 203:22, 204:17, 235:17, 237:14 proposal [2] - 177:18, 189:4 propose [1] - 241:17 proposed [10] - 132:1, 164:9, 173:21, 173:22, 235:21, 239:21, 239:24, 254:6, 257:2, 262:5 proposition [8] - 155:16, 155:20, 165:9, 172:10, 175:3, 202:20, 233:23, 235:7 propositions [5] - 151:11, 171:11, 201:17, 202:1, 202:23 protect [3] - 177:17, 191:2, 222:3 protected [4] - 147:9, 147:12, 238:19, 239:8 protecting [2] - 240:1, 240:16 protection [22] - 155:4, 177:19, 178:10, 178:11, 178:14, 179:10, 179:19, 181:25, 184:18, 207:7, 207:8, 212:1, 219:8, 220:20, 233:6, 233:10, 233:24, 235:9, 248:19, 248:24, 251:4, 251:8 proves [1] - 127:4 provide [36] - 130:11, 139:11, 140:6, 143:22, 147:15, 149:17, 153:12, 159:9, 162:11, 164:5, 164:6, 179:10, 179:19,	180:5, 180:22, 182:12, 182:25, 184:7, 184:13, 187:2, 188:6, 193:17, 193:24, 196:7, 196:23, 200:3, 205:13, 210:23, 211:4, 212:14, 212:17, 213:4, 230:9, 232:6, 254:20, 259:21 PROVIDE [2] - 212:22, 271:17 provided [11] - 143:15, 143:20, 179:15, 184:18, 206:10, 210:22, 211:3, 211:8, 228:22, 231:21, 267:7 provides [4] - 184:6, 210:16, 220:13, 220:16 providing [1] - 182:20 Province [1] - 270:8 province [9] - 143:17, 150:10, 171:21, 171:25, 172:25, 181:22, 184:20, 199:11, 210:12 province's [1] - 151:4 provincially [1] - 214:1 provision [1] - 222:2 public [7] - 183:25, 184:5, 199:4, 237:15, 238:3, 238:12 pull [6] - 127:12, 153:4, 187:25, 215:8, 228:1, 259:11 pulled [2] - 202:16, 219:25 pulling [1] - 253:2 punch [1] - 202:5 purposes [1] - 126:13 pursue [2] - 181:22, 182:19 pursued [7] - 140:16, 179:24, 182:1, 182:5, 182:16, 199:8 pursuing [5] - 147:17, 148:20, 179:7, 179:13, 197:20 purview [1] - 207:23 pushing [1] - 192:7 put [13] - 149:19, 156:18, 165:1, 171:11, 190:20, 191:1, 215:13,	218:8, 228:21, 229:8, 242:9, 267:3 puts [1] - 189:23 putting [6] - 139:23, 186:12, 215:11, 221:12, 230:13, 257:10 Q Q.C [3] - 123:16, 123:17, 123:20 quantitative [1] - 154:2 quantity [1] - 174:17 quarter [2] - 241:17, 242:3 questioning [2] - 202:7, 241:12 questions [18] - 146:1, 185:23, 214:25, 215:2, 217:14, 232:19, 232:20, 232:21, 235:1, 242:17, 244:3, 253:10, 264:12, 264:16, 264:25, 265:8, 265:12, 269:14 quick [7] - 133:4, 176:1, 216:12, 242:7, 242:16, 242:19, 268:8 quickly [6] - 127:1, 178:5, 193:8, 224:1, 240:14, 267:20 quite [10] - 145:20, 161:15, 166:11, 193:23, 202:15, 202:17, 202:18, 264:11, 266:2 quote [6] - 177:14, 200:12, 201:15, 205:8, 228:6, 263:20 quoted [1] - 155:4 quotes [1] - 202:7 R rack [2] - 192:5, 192:7 radar [3] - 168:5, 168:22, 246:16 Rae [2] - 123:22, 146:10 Rae's [1] - 146:1 raging [1] - 147:24 rain [7] - 167:19, 174:1, 246:5, 246:6, 246:13, 246:14 rainfall [24] - 138:16, 163:24, 165:19,	166:7, 167:8, 168:5, 168:21, 168:22, 168:24, 169:3, 169:13, 170:12, 173:24, 174:4, 174:8, 174:11, 245:4, 245:6, 245:9, 245:21, 245:23, 246:22, 247:1 rainfall-graded [1] - 168:5 rainfalls [1] - 166:13 raining [1] - 246:2 rains [1] - 175:25 raise [1] - 138:17 Ranch [3] - 196:23, 197:9, 197:13 ranchlands [1] - 196:20 Range [5] - 252:24, 253:12, 254:8, 255:3, 255:6 range [1] - 176:5 ranked [1] - 178:1 rare [1] - 173:6 rate [18] - 130:18, 131:2, 133:5, 134:1, 134:8, 135:1, 138:7, 155:24, 159:16, 169:2, 170:4, 170:21, 170:25, 223:11, 223:12, 223:14, 223:25, 230:16 Rates [1] - 136:22 rates [18] - 136:23, 154:10, 154:19, 155:25, 159:11, 159:24, 160:9, 160:11, 160:12, 160:23, 161:8, 165:10, 169:10, 169:21, 230:19, 231:7, 238:19, 239:9 rather [4] - 154:9, 167:22, 181:1, 244:24 rationale [1] - 188:23 re [2] - 124:8, 199:11 re-commenced [1] - 124:8 re-create [1] - 199:11 Rea [1] - 146:17 reach [3] - 155:12, 155:13, 155:19 reached [3] - 148:17, 188:19, 195:7 reaches [2] - 156:6, 195:23 read [26] - 131:23,	134:7, 146:19, 151:10, 153:9, 153:14, 175:21, 177:14, 186:9, 194:5, 196:19, 200:12, 202:7, 205:8, 213:12, 217:9, 217:11, 218:24, 220:9, 222:12, 223:4, 226:2, 226:10, 227:7, 228:4, 228:6 reading [2] - 201:12, 217:19 readings [1] - 168:17 reads [2] - 175:21, 186:9 ready [7] - 185:11, 232:4, 232:11, 242:21, 242:23, 242:24, 243:24 reality [1] - 183:1 realize [1] - 216:5 really [10] - 127:6, 181:13, 198:14, 228:5, 240:14, 241:15, 249:20, 264:23, 267:19, 268:1 realm [1] - 183:19 reason [8] - 186:23, 194:18, 201:25, 203:20, 216:12, 219:9, 223:5, 226:20 reasonable [5] - 186:21, 248:16, 262:7, 262:9, 262:17 reasons [2] - 187:8, 187:22 rebuilt [1] - 197:25 receipt [1] - 260:4 receive [6] - 139:15, 212:1, 233:6, 233:9, 233:24, 235:9 received [3] - 206:24, 210:2, 259:22 receiving [3] - 139:14, 216:3, 260:8 recent [1] - 255:13 reclamation [1] - 257:21 recognize [1] - 145:18 recognized [2] - 181:23, 197:4 recognizing [1] - 180:22 recommend [4] - 217:25, 261:6, 261:16, 261:17 recommendation [2] -
---	---	---	--	--

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>231:12, 261:14 Recommendations [1] - 161:21 recommendations [6] - 185:16, 189:21, 190:3, 196:15, 213:2, 213:8 recommending [1] - 266:7 record [22] - 125:10, 125:16, 125:21, 132:7, 136:4, 139:5, 139:15, 141:19, 143:8, 163:13, 168:3, 171:22, 175:8, 175:12, 175:15, 175:16, 179:6, 179:20, 191:3, 212:12, 212:15 RECORD [1] - 216:17 recorded [2] - 127:1, 175:18 records [4] - 167:25, 175:4, 179:1, 212:17 recreation [1] - 199:3 recreational [3] - 196:12, 196:23, 198:25 rectified [1] - 216:14 recurrence [4] - 165:2, 262:13, 262:21, 263:23 red [1] - 137:9 reduce [13] - 140:23, 143:1, 153:25, 154:15, 154:24, 165:10, 165:12, 169:25, 183:11, 184:7, 221:20, 225:16, 226:22 reduced [3] - 143:8, 148:13, 182:8 reducing [4] - 141:15, 149:23, 150:16, 181:20 reduction [8] - 153:16, 153:19, 176:3, 183:19, 184:19, 207:14, 210:3, 210:16 redundancy [1] - 187:21 Redwood [19] - 139:8, 139:24, 140:12, 144:3, 155:5, 158:19, 190:12, 190:23, 191:16, 193:13, 193:22, 232:24, 233:21,</p>	<p>235:8, 235:18, 235:25, 237:5, 237:8, 237:10 refer [1] - 143:14 reference [22] - 130:16, 136:17, 150:14, 166:9, 171:14, 171:16, 188:11, 197:3, 197:11, 202:9, 202:10, 206:4, 206:9, 211:1, 211:5, 229:19, 243:2, 243:3, 252:25, 253:3, 261:14, 261:15 referenced [14] - 130:23, 151:6, 181:11, 197:6, 206:6, 206:12, 207:1, 207:19, 208:10, 211:1, 211:2, 231:18, 232:2, 267:5 references [2] - 194:5, 198:16 referencing [3] - 143:21, 194:2, 221:5 referred [11] - 144:11, 147:16, 166:6, 188:16, 193:16, 220:25, 227:6, 233:22, 238:11, 238:21, 240:24 referring [19] - 136:17, 137:8, 146:11, 146:17, 147:11, 153:2, 154:21, 165:8, 175:18, 178:20, 186:7, 196:13, 202:11, 208:7, 233:11, 234:10, 235:21, 235:23, 241:1 reflect [2] - 223:6, 230:18 reflected [3] - 139:1, 151:24, 235:14 reflects [1] - 231:6 reframe [1] - 233:8 regardless [1] - 216:3 regards [1] - 157:9 region [2] - 200:20, 203:19 regulated [1] - 210:13 regulator [2] - 211:4, 213:24 Regulator [3] - 211:8, 258:4, 258:9 regulatory [5] - 205:6,</p>	<p>206:11, 206:15, 229:2, 229:5 reimburse [1] - 256:4 relate [1] - 264:14 related [5] - 151:7, 213:22, 236:21, 245:3, 265:8 relates [2] - 196:2, 231:25 relating [3] - 194:3, 197:8, 217:14 relation [10] - 129:2, 135:6, 147:7, 152:17, 195:20, 254:24, 256:10, 257:6, 260:25, 266:7 relative [2] - 158:18, 198:11 relatively [3] - 209:25, 224:5, 225:11 releases [1] - 205:18 relocates [1] - 259:24 relocation [7] - 255:13, 257:1, 258:2, 258:19, 259:5, 259:6, 260:14 relocations [1] - 256:21 remained [1] - 255:12 remaining [1] - 163:4 remember [7] - 133:8, 136:8, 142:21, 198:17, 246:3, 254:11, 264:3 remind [4] - 138:14, 140:7, 150:9, 154:12 remote [2] - 192:24, 248:9 removal [3] - 194:6, 255:19, 255:23 remove [3] - 145:8, 257:16, 257:18 removed [6] - 150:22, 253:14, 253:19, 253:23, 254:3, 255:7 repair [4] - 236:25, 237:6, 237:13, 238:9 repairs [7] - 235:16, 235:17, 235:24, 236:14, 236:21, 237:14, 238:6 repeat [7] - 150:20, 161:5, 162:1, 195:10, 221:2, 239:1, 240:13 repeated [1] - 149:2 rephrase [2] - 137:14, 204:2 replace [1] - 131:17 replaced [3] - 198:22,</p>	<p>237:16, 238:4 replacement [2] - 199:8, 255:23 report [41] - 129:9, 136:18, 136:24, 152:25, 153:2, 155:3, 162:3, 162:11, 174:20, 175:20, 178:11, 178:21, 182:8, 187:18, 188:16, 192:3, 193:5, 193:7, 194:2, 195:7, 199:15, 201:15, 204:18, 204:23, 210:20, 210:25, 211:9, 211:13, 211:14, 211:21, 212:5, 212:16, 213:9, 213:11, 217:21, 221:9, 227:23, 231:20, 251:13, 267:6 Report [23] - 131:21, 131:22, 161:24, 186:8, 217:24, 218:3, 218:21, 219:1, 219:4, 220:10, 220:15, 222:12, 222:21, 226:12, 228:8, 228:9, 229:25, 230:8, 231:2, 232:17, 250:10, 250:16, 251:23 reported [1] - 166:12 REPORTER [6] - 126:15, 126:18, 126:20, 128:14, 128:17, 128:19 reporter [2] - 130:6, 242:7 Reporter [3] - 214:4, 270:12, 270:17 Reporters [1] - 124:5 reporters [1] - 126:22 reporting [1] - 187:15 reports [1] - 189:4 representation [1] - 160:21 request [2] - 211:4, 227:1 requested [2] - 124:12, 214:12 requests [1] - 228:15 require [3] - 194:6, 257:4, 266:23 required [14] - 140:18, 142:6, 153:12, 153:24, 170:21,</p>	<p>171:2, 171:4, 177:17, 179:9, 179:11, 209:6, 227:13, 227:15, 230:20 requirement [2] - 170:5, 261:8 requirements [2] - 142:6, 262:25 requires [1] - 256:25 research [1] - 189:2 RESERVOIR [1] - 122:10 reservoir [39] - 129:3, 129:5, 131:5, 131:9, 131:14, 133:9, 133:15, 133:18, 134:21, 145:4, 147:13, 147:18, 148:21, 162:24, 162:25, 163:4, 163:13, 163:15, 163:23, 164:12, 164:13, 164:21, 170:2, 170:4, 170:7, 170:12, 170:14, 171:2, 171:8, 173:17, 173:18, 177:12, 187:20, 194:7, 206:14, 258:21, 258:25, 262:12 Reservoir [32] - 137:11, 137:22, 137:24, 140:21, 141:2, 142:16, 143:5, 143:12, 145:3, 148:4, 149:9, 150:5, 150:6, 151:22, 152:2, 154:1, 154:7, 154:16, 165:24, 166:4, 168:12, 168:19, 169:22, 170:3, 182:18, 188:8, 207:8, 207:11, 208:4, 208:8, 209:10, 233:3 reservoirs [2] - 147:14, 148:12 residences [2] - 143:11, 209:25 resident [1] - 177:22 residential [1] - 146:21 residents [10] - 141:5, 142:15, 145:14, 178:2, 181:17, 184:2, 208:1, 208:2, 208:3, 212:1</p>
---	---	---	--	--

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>residual [6] - 207:9, 208:19, 208:20, 209:9, 209:14, 234:12</p> <p>resource [2] - 150:24, 151:4</p> <p>RESOURCES [1] - 122:2</p> <p>resources [1] - 246:19</p> <p>Resources [2] - 123:1, 228:13</p> <p>respect [4] - 169:15, 187:19, 254:1, 259:24</p> <p>respectful [1] - 267:21</p> <p>respond [6] - 142:18, 159:13, 195:9, 218:12, 233:1, 245:7</p> <p>responding [1] - 142:3</p> <p>responds [1] - 202:24</p> <p>response [22] - 126:18, 126:19, 143:15, 157:7, 158:14, 166:10, 172:15, 180:6, 180:22, 182:12, 187:2, 193:18, 196:8, 210:24, 232:7, 240:12, 240:25, 243:1, 251:11, 255:10, 267:7</p> <p>responses [7] - 130:24, 199:20, 228:12, 229:1, 243:15, 251:12, 261:12</p> <p>responsibility [4] - 142:7, 143:16, 238:14, 238:22</p> <p>responsible [7] - 189:10, 232:5, 236:22, 237:5, 237:11, 237:12, 238:10</p> <p>rest [1] - 133:11</p> <p>restriction [8] - 129:2, 129:5, 131:4, 131:5, 131:14, 131:18, 133:13</p> <p>result [15] - 134:5, 135:21, 139:25, 143:7, 144:7, 163:13, 172:19, 193:15, 195:23, 196:11, 221:14, 225:8, 235:19, 236:14, 248:16</p> <p>resultant [1] - 141:11</p>	<p>resulted [1] - 245:9</p> <p>results [4] - 132:2, 161:3, 161:11, 168:9</p> <p>return [3] - 160:10, 161:24, 247:20</p> <p>returned [1] - 157:2</p> <p>revelment [1] - 219:18</p> <p>review [10] - 127:10, 165:17, 188:9, 188:14, 188:19, 189:3, 206:11, 234:6, 242:16, 252:20</p> <p>reviewed [1] - 251:5</p> <p>reviewing [1] - 215:3</p> <p>revised [2] - 226:20, 226:21</p> <p>revises [2] - 222:22, 226:12</p> <p>revision [6] - 218:20, 219:22, 222:7, 225:20, 227:22, 228:19</p> <p>revisit [1] - 266:6</p> <p>Richard [3] - 124:1, 124:24, 127:3</p> <p>Rideau [2] - 148:5, 149:13</p> <p>Ridge [4] - 209:21, 233:23, 234:5, 235:3</p> <p>right-hand [1] - 162:17</p> <p>right-of-way [6] - 256:14, 256:15, 257:4, 257:7, 257:8, 258:2</p> <p>right-of-ways [4] - 256:14, 256:17, 256:20, 258:20</p> <p>riprap [25] - 190:11, 190:13, 190:23, 192:25, 193:13, 219:18, 220:13, 220:20, 221:23, 222:3, 240:2, 240:8, 240:9, 240:18, 248:20, 248:24, 249:9, 249:13, 251:23, 261:5, 261:10, 261:13, 261:18, 266:1, 266:13</p> <p>riprapped [2] - 261:7, 266:8</p> <p>riprapping [1] - 266:14</p> <p>risk [25] - 153:16, 153:19, 165:6, 165:25, 166:4, 172:6, 180:14,</p>	<p>181:20, 183:19, 184:19, 186:13, 207:10, 207:15, 208:20, 208:21, 209:9, 210:3, 210:15, 210:16, 221:24, 226:23, 234:2, 234:7, 234:12, 235:3</p> <p>River [54] - 123:20, 125:22, 137:24, 141:1, 142:15, 143:10, 147:6, 147:11, 147:15, 147:20, 147:23, 148:3, 148:4, 148:7, 148:12, 148:16, 149:5, 149:8, 149:12, 149:14, 149:18, 150:3, 150:10, 150:11, 151:14, 151:25, 152:5, 152:9, 152:12, 152:18, 154:18, 168:1, 174:1, 174:7, 174:9, 175:4, 175:5, 182:8, 184:7, 185:17, 188:6, 190:24, 191:12, 195:23, 198:6, 200:16, 201:8, 205:1, 206:8, 206:15, 207:4, 207:21, 236:20, 247:24</p> <p>river [41] - 137:23, 138:2, 148:14, 150:19, 160:23, 161:7, 165:10, 169:2, 169:6, 169:8, 171:20, 173:19, 174:15, 178:3, 178:4, 180:3, 180:12, 183:15, 190:13, 190:16, 192:17, 193:14, 201:21, 202:21, 203:24, 204:4, 204:10, 204:13, 206:8, 210:7, 210:15, 210:19, 238:19, 239:9, 244:21, 244:23, 245:10, 246:7, 247:20, 251:9</p> <p>riverbanks [1] - 198:7</p> <p>Riverdale [2] - 148:5, 149:12</p> <p>rivers [1] - 200:24</p> <p>road [8] - 171:19,</p>	<p>244:22, 252:23, 254:8, 254:12, 254:16, 255:2, 255:4</p> <p>Road [11] - 252:24, 253:5, 253:12, 253:13, 254:2, 254:8, 254:25, 255:4, 255:6, 259:3</p> <p>roads [1] - 254:3</p> <p>Roberts [1] - 123:8</p> <p>Robinson [1] - 197:18</p> <p>Robinson's [2] - 197:11, 197:15</p> <p>rock [10] - 219:5, 220:17, 222:18, 223:1, 225:16, 247:10, 247:17, 247:19, 247:21</p> <p>rock/soil [1] - 252:1</p> <p>rocks [10] - 186:11, 190:13, 190:15, 190:21, 190:23, 191:5, 191:11, 191:22, 191:24</p> <p>rocky [1] - 247:8</p> <p>Rocky [14] - 178:6, 179:12, 180:1, 184:11, 190:10, 208:13, 208:17, 210:1, 211:25, 212:9, 237:1, 237:2, 239:11, 239:23</p> <p>role [2] - 159:18, 160:17</p> <p>roll [1] - 185:12</p> <p>Ron [1] - 123:16</p> <p>room [1] - 157:3</p> <p>roughly [4] - 136:7, 170:7, 244:10, 250:17</p> <p>Round [3] - 166:10, 211:3, 228:12</p> <p>route [1] - 147:18</p> <p>routing [2] - 131:24, 134:16</p> <p>row [2] - 167:7, 167:16</p> <p>Roxboro [2] - 148:6, 149:13</p> <p>RPR [2] - 124:5, 270:11</p> <p>rubric [2] - 125:23, 126:8</p> <p>run [6] - 127:25, 155:14, 155:15, 177:9, 246:20, 251:8</p> <p>runoff [2] - 247:12, 247:15</p> <p>runs [1] - 132:3</p>	<p style="text-align: center;">S</p> <p>safe [2] - 186:14, 192:9</p> <p>safely [2] - 172:17, 173:10</p> <p>safety [10] - 128:10, 130:24, 163:6, 163:9, 163:19, 171:5, 187:9, 199:22, 251:5, 255:1</p> <p>Sandi [1] - 123:8</p> <p>Sara [2] - 123:19, 123:23</p> <p>Sarcee [2] - 168:10, 168:14</p> <p>Saskatchewan [3] - 171:25, 200:16, 201:8</p> <p>satisfactory [1] - 194:25</p> <p>scenario [22] - 136:23, 138:19, 139:4, 139:5, 140:20, 143:24, 143:25, 149:21, 150:15, 150:20, 164:18, 164:20, 164:25, 165:25, 167:17, 174:2, 182:14, 182:16, 182:24, 183:5, 252:9</p> <p>scenarios [1] - 177:9</p> <p>schedule [2] - 242:10, 269:2</p> <p>scheme [1] - 132:2</p> <p>SCLG [8] - 124:25, 125:3, 127:20, 136:20, 160:4, 211:21, 242:13, 261:6</p> <p>scope [1] - 205:4</p> <p>Scott [3] - 123:12, 124:4</p> <p>scour [2] - 220:13, 222:3</p> <p>screen [8] - 151:17, 151:24, 156:17, 216:11, 216:15, 239:18, 268:18, 268:21</p> <p>screening [1] - 148:20</p> <p>scroll [6] - 131:20, 162:15, 221:7, 228:2, 229:6, 241:14</p> <p>scrolling [1] - 241:6</p> <p>SE [1] - 148:1</p> <p>season [3] - 201:1, 201:3, 201:22</p> <p>second [79] - 129:6,</p>
---	--	--	---	---

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>129:11, 130:15, 130:17, 130:22, 131:3, 131:6, 131:10, 132:13, 132:22, 134:5, 134:9, 134:10, 134:22, 135:2, 135:5, 135:7, 135:9, 135:10, 135:14, 135:15, 135:20, 137:1, 137:4, 137:6, 137:15, 137:16, 137:17, 138:3, 138:11, 138:23, 138:24, 139:6, 139:16, 140:23, 140:24, 140:25, 141:10, 143:2, 144:1, 144:18, 144:24, 145:5, 145:8, 146:9, 146:18, 147:22, 147:23, 149:8, 153:5, 153:8, 154:17, 157:13, 157:21, 157:23, 158:4, 158:5, 164:18, 165:11, 165:12, 165:13, 167:7, 171:3, 172:10, 181:19, 181:20, 182:7, 182:9, 198:17, 203:3, 207:11, 208:2, 216:12, 223:8, 228:3, 245:3</p> <p>second-last [1] - 146:18</p> <p>Second [49] - 124:1, 124:9, 124:24, 125:7, 125:25, 126:2, 126:18, 127:24, 129:22, 134:18, 146:7, 146:13, 153:6, 156:15, 157:9, 161:5, 162:2, 178:17, 184:4, 184:25, 185:13, 186:2, 186:5, 190:1, 197:12, 198:16, 203:1, 203:14, 203:17, 204:2, 214:23, 215:22, 216:21, 217:4, 219:25, 239:1, 240:13, 240:23, 243:6, 243:23, 253:18, 254:19, 264:7, 265:21, 266:18, 267:12,</p>	<p>267:21, 267:25</p> <p>SECORD [68] - 124:18, 124:23, 126:10, 126:17, 127:4, 127:20, 127:25, 128:20, 130:8, 142:10, 145:25, 146:8, 146:14, 146:17, 147:19, 149:3, 153:7, 156:18, 156:21, 156:25, 162:3, 162:10, 162:14, 167:3, 175:2, 178:20, 185:4, 185:7, 185:15, 186:1, 186:6, 187:24, 202:14, 202:25, 203:2, 203:4, 203:6, 203:9, 203:13, 203:15, 212:25, 214:24, 215:6, 215:15, 215:25, 216:18, 216:22, 217:6, 241:11, 241:25, 242:5, 242:18, 243:8, 243:11, 243:25, 244:13, 254:18, 264:9, 264:18, 265:24, 266:4, 267:10, 268:6, 268:12, 268:14, 268:19, 268:24, 271:10</p> <p>secord [3] - 201:12, 241:7, 245:5</p> <p>Secord's [2] - 127:17, 191:23</p> <p>section [6] - 192:16, 222:14, 222:22, 223:6, 264:10, 264:22</p> <p>sections [3] - 220:18, 220:21, 249:3</p> <p>security [1] - 200:4</p> <p>sediment [4] - 163:10, 163:23, 187:3, 193:6</p> <p>sedimentation [1] - 170:18</p> <p>see [30] - 124:16, 127:6, 128:15, 130:16, 133:3, 135:21, 151:17, 155:2, 162:15, 167:9, 174:12, 186:3, 187:7, 187:14, 189:6, 199:20, 216:13,</p>	<p>222:1, 227:9, 229:9, 239:18, 240:8, 242:1, 242:2, 247:12, 247:18, 255:11, 264:22, 264:24, 269:17</p> <p>seeing [5] - 133:12, 160:21, 169:14, 203:18, 203:21</p> <p>seek [1] - 125:8</p> <p>segment [4] - 165:23, 214:15, 250:14, 266:20</p> <p>segments [2] - 220:14, 222:20</p> <p>select [1] - 188:23</p> <p>selected [7] - 140:13, 142:10, 161:3, 161:10, 171:22, 171:24, 213:14</p> <p>selecting [2] - 158:16, 161:22</p> <p>selection [5] - 147:17, 154:18, 188:15, 188:23, 213:13</p> <p>send [3] - 136:3, 140:24, 145:13</p> <p>sending [5] - 141:5, 141:13, 145:5, 164:23, 231:15</p> <p>Senek [1] - 123:18</p> <p>sense [3] - 155:1, 245:10, 258:2</p> <p>sensing [1] - 248:9</p> <p>sent [6] - 127:11, 143:10, 162:5, 216:7, 238:19, 239:9</p> <p>sentence [1] - 155:3</p> <p>separate [2] - 226:14, 236:18</p> <p>separately [1] - 250:24</p> <p>series [5] - 160:12, 177:6, 177:10, 219:4, 246:14</p> <p>served [1] - 184:1</p> <p>service [5] - 133:6, 134:13, 171:18, 171:21, 219:6</p> <p>SESSION [1] - 271:3</p> <p>Session [2] - 122:21, 123:4</p> <p>set [4] - 128:1, 181:23, 232:16, 263:1</p> <p>setup [1] - 263:1</p> <p>seven [6] - 196:17, 245:16, 245:17, 245:23, 246:5, 264:25</p> <p>seven-day [3] -</p>	<p>245:16, 245:17, 245:23</p> <p>several [2] - 187:22, 199:20</p> <p>severe [2] - 152:20, 205:18</p> <p>shaking [1] - 199:10</p> <p>shallow [1] - 260:14</p> <p>shape [1] - 180:19</p> <p>shapes [1] - 181:4</p> <p>share [1] - 202:3</p> <p>sharing [1] - 216:12</p> <p>shave [1] - 164:19</p> <p>shed [1] - 240:10</p> <p>short [2] - 264:1, 266:20</p> <p>shorthand [2] - 270:5, 270:6</p> <p>Shouldice [1] - 146:24</p> <p>show [2] - 210:12, 249:3</p> <p>showed [1] - 201:3</p> <p>showing [1] - 144:6</p> <p>shown [6] - 134:22, 166:22, 167:6, 174:5, 199:24, 238:7</p> <p>shows [4] - 167:19, 198:7, 250:13, 250:15</p> <p>shut [1] - 173:17</p> <p>SIA [1] - 261:6</p> <p>SIA's [1] - 261:13</p> <p>side [9] - 204:15, 220:11, 220:16, 221:14, 221:18, 222:23, 225:8, 261:7, 266:8</p> <p>sides [1] - 222:15</p> <p>sidetrack [1] - 266:5</p> <p>sign [2] - 265:16, 267:13</p> <p>sign-in [1] - 267:13</p> <p>sign-on [1] - 265:16</p> <p>signatures [1] - 215:11</p> <p>signed [2] - 185:9, 189:6</p> <p>significant [15] - 139:7, 145:19, 145:22, 148:14, 158:3, 159:18, 182:6, 199:4, 199:5, 199:9, 200:25, 201:22, 221:15, 227:10, 249:10</p> <p>signing [1] - 255:17</p> <p>signs [1] - 189:23</p> <p>sim [1] - 177:5</p> <p>similar [8] - 153:16, 153:19, 181:25,</p>	<p>196:1, 207:12, 208:21, 209:10, 251:15</p> <p>similarly [3] - 157:11, 173:11, 262:23</p> <p>simple [1] - 256:9</p> <p>simplistic [1] - 165:17</p> <p>simply [3] - 134:11, 202:7, 257:7</p> <p>simulate [1] - 247:1</p> <p>simulated [3] - 139:2, 246:20, 247:18</p> <p>simulations [1] - 164:16</p> <p>SIRs [2] - 130:23, 211:3</p> <p>sister [1] - 147:3</p> <p>sit [2] - 237:8, 241:19</p> <p>site [1] - 244:10</p> <p>sites [1] - 153:11</p> <p>sitting [2] - 231:9, 260:21</p> <p>situation [2] - 136:13, 209:22</p> <p>six [1] - 189:5</p> <p>six-page [1] - 189:5</p> <p>size [5] - 133:16, 171:9, 186:20, 187:8, 206:11</p> <p>skill [1] - 270:7</p> <p>slightly [5] - 158:11, 210:17, 224:21, 225:16</p> <p>slope [2] - 225:8, 226:17</p> <p>slopes [6] - 220:11, 220:16, 221:14, 221:18, 222:15, 222:23</p> <p>slowing [1] - 159:21</p> <p>slowly [1] - 162:1</p> <p>small [5] - 155:7, 177:15, 177:21, 196:21, 225:11</p> <p>SMITH [4] - 124:21, 195:10, 195:15, 271:7</p> <p>snagged [1] - 191:5</p> <p>so.. [4] - 169:18, 183:8, 244:24, 268:15</p> <p>social [2] - 151:5, 196:12</p> <p>soil [6] - 220:17, 220:19, 220:22, 223:17, 251:15, 251:25</p> <p>soils [7] - 221:16, 223:3, 223:7, 223:19, 223:20,</p>
---	--	---	---	---

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>223:24, 261:23 Sol [3] - 233:1, 233:7, 236:6 SOL [25] - 124:21, 233:2, 233:8, 233:11, 233:14, 233:20, 234:1, 234:6, 234:9, 234:12, 234:15, 234:18, 234:22, 234:25, 235:5, 235:13, 235:21, 236:2, 236:7, 236:12, 236:16, 237:20, 237:23, 237:25, 271:7 sol [1] - 237:22 someone [1] - 253:11 sometime [1] - 253:14 somewhat [1] - 129:3 somewhere [4] - 147:25, 149:19, 173:2, 244:19 SORP [1] - 125:4 sorry [38] - 125:25, 126:15, 128:6, 128:14, 128:22, 129:21, 140:8, 140:25, 141:23, 147:14, 151:20, 153:21, 155:12, 156:4, 158:21, 159:3, 166:18, 168:25, 182:4, 184:21, 189:25, 195:10, 200:19, 208:20, 214:3, 215:13, 215:23, 223:12, 229:11, 230:22, 233:8, 239:4, 245:19, 246:8, 248:4, 254:19, 262:20, 266:3 sort [5] - 126:23, 195:17, 215:3, 260:12, 265:19 sound [4] - 126:10, 196:10, 239:2, 268:3 sounds [4] - 214:20, 243:13, 251:11, 257:24 source [5] - 129:1, 151:14, 152:5, 152:13, 221:16 sourced [1] - 136:19 sourcing [1] - 225:6 south [2] - 147:5, 259:2 South [2] - 200:15,</p>	<p>201:7 south-west [1] - 259:2 southwest [1] - 226:13 space [1] - 257:5 sparse [1] - 209:25 spatially [1] - 250:15 speaker [1] - 132:17 SPEAKER [1] - 242:14 speaking [17] - 126:16, 128:14, 128:15, 129:20, 145:24, 182:19, 184:21, 197:16, 198:2, 204:4, 224:23, 225:10, 239:16, 247:16, 250:17, 250:25 specialize [1] - 246:19 specific [8] - 136:18, 141:24, 142:4, 148:9, 189:15, 191:23, 204:3, 236:21 specifically [10] - 149:16, 149:21, 151:6, 155:5, 177:20, 183:22, 192:13, 200:6, 211:7, 261:2 speculate [3] - 150:18, 182:3, 236:2 speculative [4] - 175:19, 191:8, 193:18, 193:24 speeds [1] - 262:21 SPELLER [25] - 124:20, 161:14, 162:13, 162:16, 167:12, 180:7, 201:10, 203:17, 210:25, 211:11, 213:6, 239:1, 239:4, 239:13, 239:17, 239:19, 244:6, 244:14, 244:18, 244:20, 244:23, 245:1, 245:3, 253:2, 271:6 speller [1] - 203:15 Speller [19] - 161:14, 162:13, 162:16, 167:13, 180:5, 195:9, 201:9, 201:10, 201:16, 202:5, 202:22, 203:15, 210:23, 211:9, 213:4, 214:15, 214:20, 239:17, 244:6</p>	<p>spill [1] - 132:19 spills [1] - 133:11 spillway [17] - 133:6, 134:13, 164:14, 173:20, 173:23, 219:6, 219:13, 249:22, 249:23, 250:2, 250:11, 251:3, 251:16, 251:17, 252:3, 252:18 spillways [2] - 133:11, 173:12 spit [1] - 230:14 splay [1] - 191:16 splitting [1] - 172:18 sponge [1] - 223:22 spot [2] - 217:5, 217:6 spots [1] - 211:2 spring [1] - 188:11 Springbank [13] - 137:22, 141:6, 143:10, 182:18, 188:8, 208:1, 233:5, 233:9, 238:18, 239:7, 263:12, 263:19 SPRINGBANK [1] - 122:10 square [5] - 151:21, 152:9, 246:15, 248:13, 266:12 SR [1] - 251:16 SR1 [176] - 124:1, 125:4, 127:21, 128:4, 128:9, 129:4, 129:9, 129:16, 130:16, 131:2, 131:5, 131:13, 132:20, 132:21, 133:23, 135:6, 135:8, 136:2, 136:8, 136:10, 136:22, 137:2, 137:10, 137:20, 137:21, 138:21, 139:6, 139:8, 139:10, 139:14, 139:23, 140:5, 140:21, 140:22, 141:2, 141:5, 141:10, 142:10, 142:12, 142:20, 142:21, 143:7, 144:2, 144:16, 145:3, 145:7, 145:13, 145:15, 147:9, 147:12, 147:21, 149:7, 149:21, 150:9, 150:14,</p>	<p>150:21, 152:17, 152:21, 153:15, 155:8, 155:10, 155:16, 155:17, 156:8, 157:10, 157:19, 158:5, 158:15, 158:19, 158:25, 160:24, 161:2, 161:8, 161:10, 161:22, 162:19, 162:22, 164:9, 164:17, 164:22, 165:6, 165:12, 165:19, 165:20, 165:25, 166:2, 166:14, 167:10, 168:2, 169:15, 170:2, 172:13, 172:15, 172:22, 173:4, 173:11, 173:14, 176:7, 176:19, 177:18, 177:24, 178:6, 178:8, 178:10, 178:12, 179:4, 179:7, 180:9, 181:22, 183:9, 184:1, 184:2, 184:5, 186:16, 186:22, 186:23, 187:8, 188:15, 188:25, 192:9, 192:22, 192:25, 193:15, 194:11, 194:12, 194:17, 194:20, 195:20, 195:23, 196:4, 196:19, 196:20, 199:15, 199:17, 199:18, 201:8, 203:24, 204:7, 204:9, 204:13, 206:2, 206:17, 206:22, 207:7, 207:10, 207:17, 208:21, 209:9, 213:14, 231:10, 231:19, 232:23, 233:7, 233:10, 233:12, 233:24, 234:3, 234:24, 235:10, 235:11, 235:20, 236:1, 236:18, 237:16, 237:19, 238:5, 238:7, 238:20, 238:25, 239:3, 239:9, 239:12, 261:24 SSRB [1] - 200:15 stability [1] - 223:2 Staff [7] - 123:11,</p>	<p>123:12, 123:12, 123:13, 123:13, 123:14, 123:14 staff [2] - 269:6, 269:13 stage [5] - 180:11, 182:16, 187:17, 213:14, 256:6 stakeholder [2] - 187:23, 212:8 stakeholders [2] - 187:19, 206:24 Stampede [2] - 148:6, 149:14 standard [4] - 172:6, 172:8, 236:5 standards [1] - 184:19 Stantec [4] - 207:13, 211:14, 211:15, 263:18 Stantec's [2] - 259:8, 259:12 start [11] - 127:10, 130:5, 142:3, 149:25, 173:7, 244:7, 265:10, 265:15, 265:16, 267:15, 267:23 started [1] - 129:25 starting [1] - 265:17 starts [1] - 183:18 state [1] - 254:6 statement [6] - 140:16, 152:3, 153:23, 196:24, 200:11, 204:17 States [1] - 171:13 states [7] - 131:23, 146:18, 162:11, 177:14, 191:12, 205:8, 207:9 static [2] - 126:3, 126:7 stating [1] - 213:10 stay [1] - 185:9 staying [1] - 257:3 steady [1] - 255:12 steeper [1] - 221:19 Stephanie [1] - 123:13 still [14] - 128:15, 142:14, 144:23, 148:14, 150:15, 161:15, 165:6, 180:2, 180:10, 180:13, 181:18, 210:18, 252:24, 254:5 stole [1] - 241:8 Stoney [1] - 123:22 stood [1] - 250:8</p>
--	---	--	--	---

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>stop ^[1] - 228:3</p> <p>stopped ^[1] - 176:13</p> <p>storage ^[28] - 128:4, 128:5, 128:9, 128:21, 142:22, 142:23, 151:8, 152:24, 153:11, 153:12, 154:23, 158:8, 159:20, 162:12, 164:2, 164:6, 164:7, 164:11, 169:16, 175:24, 179:4, 184:8, 204:19, 205:12, 205:16, 207:3, 222:11, 225:19</p> <p>store ^[5] - 133:9, 152:17, 153:24, 162:23, 163:3</p> <p>storing ^[1] - 154:15</p> <p>storm ^[1] - 181:14</p> <p>straight ^[3] - 230:20, 244:24, 262:15</p> <p>strategy ^[2] - 160:1, 205:10</p> <p>STREAM ^[1] - 122:10</p> <p>stream ^[5] - 168:25, 175:23, 201:4, 222:11</p> <p>streams ^[1] - 248:12</p> <p>Street ^[1] - 148:1</p> <p>stretch ^[3] - 124:15, 142:7, 183:3</p> <p>stretches ^[1] - 224:6</p> <p>strictly ^[1] - 259:14</p> <p>strongest ^[1] - 263:8</p> <p>structural ^[1] - 217:25</p> <p>structure ^[38] - 132:24, 133:25, 134:8, 134:12, 135:1, 135:10, 135:16, 135:17, 136:3, 137:16, 141:9, 141:12, 156:9, 170:2, 170:5, 170:11, 171:1, 173:11, 177:11, 186:12, 187:12, 191:14, 192:20, 193:1, 193:9, 197:21, 197:22, 208:8, 209:24, 226:6, 226:7, 226:15, 226:23, 227:1, 249:12, 251:20, 251:24, 252:5</p> <p>structures ^[1] - 173:9</p> <p>studied ^[1] - 188:9</p>	<p>studies ^[6] - 205:24, 212:7, 255:18, 255:23, 256:6, 260:3</p> <p>study ^[3] - 200:16, 201:3, 206:1</p> <p>studying ^[1] - 258:12</p> <p>subclimates ^[1] - 152:1</p> <p>subject ^[11] - 128:25, 131:11, 131:19, 144:17, 151:16, 192:15, 196:9, 206:15, 212:20, 232:1, 266:9</p> <p>subjected ^[2] - 237:18, 238:4</p> <p>subjective ^[1] - 213:20</p> <p>submerged ^[1] - 226:8</p> <p>submission ^[2] - 197:6, 229:4</p> <p>submissions ^[3] - 154:13, 160:5, 186:19</p> <p>submit ^[2] - 195:25, 256:1</p> <p>submitted ^[5] - 138:5, 152:23, 214:2, 250:1, 250:9</p> <p>submitting ^[1] - 255:21</p> <p>subsequent ^[1] - 187:17</p> <p>subtotal ^[1] - 259:13</p> <p>subtract ^[2] - 137:6, 137:8</p> <p>suddenly ^[1] - 129:22</p> <p>sufficient ^[2] - 170:10, 199:25</p> <p>suggest ^[2] - 175:11, 214:7</p> <p>suggested ^[2] - 144:22, 183:23</p> <p>suggesting ^[1] - 267:7</p> <p>suggestion ^[2] - 261:13, 268:8</p> <p>summarized ^[3] - 132:3, 178:21, 228:9</p> <p>summarizes ^[1] - 160:9</p> <p>Summary ^[2] - 131:22, 226:1</p> <p>summary ^[6] - 131:24, 189:2, 217:12, 218:24, 220:8, 222:11</p> <p>summer ^[3] - 201:1, 201:22, 231:14</p> <p>Sunnyside ^[1] - 147:1</p> <p>superior ^[4] - 138:20, 138:22, 211:21,</p>	<p>211:23</p> <p>supplement ^[3] - 157:7, 158:14, 159:13</p> <p>supplemental ^[1] - 228:15</p> <p>supplies ^[1] - 152:12</p> <p>supply ^[7] - 150:24, 151:15, 152:14, 174:24, 200:6, 200:15, 205:14</p> <p>support ^[3] - 188:4, 213:15, 269:19</p> <p>supposed ^[3] - 210:13, 215:13, 268:14</p> <p>surcharge ^[1] - 164:11</p> <p>surface ^[8] - 191:21, 200:14, 219:13, 247:5, 247:19, 247:23, 248:4, 266:12</p> <p>surge ^[1] - 198:9</p> <p>survivability ^[1] - 251:19</p> <p>susceptible ^[1] - 209:21</p> <p>suspect ^[1] - 267:2</p> <p>sustained ^[3] - 263:10, 263:11, 263:19</p> <p>SVENSON ^[7] - 124:20, 212:3, 212:11, 254:21, 255:3, 255:9, 271:6</p> <p>Svenson ^[2] - 254:20, 254:23</p> <p>swell ^[1] - 245:9</p> <p>Swenson ^[2] - 211:20, 212:4</p> <p>sworn ^[1] - 124:22</p> <p>Sylvia ^[1] - 123:14</p> <p>system ^[6] - 142:21, 142:24, 170:22, 171:20, 217:25, 236:19</p>	<p>taller ^[1] - 222:20</p> <p>target ^[1] - 166:2</p> <p>targeted ^[1] - 208:3</p> <p>taxpayer ^[3] - 230:24, 230:25, 231:17</p> <p>team ^[1] - 218:6</p> <p>technical ^[5] - 150:13, 179:16, 182:12, 241:9, 268:9</p> <p>technically ^[2] - 157:3, 157:4</p> <p>technique ^[1] - 262:23</p> <p>Technologies ^[1] - 123:15</p> <p>temperatures ^[5] - 200:17, 201:19, 202:21, 203:23, 204:10</p> <p>temporal ^[1] - 181:15</p> <p>temporary ^[1] - 257:4</p> <p>ten ^[4] - 139:18, 139:25, 140:4, 185:2</p> <p>ten-year ^[3] - 139:18, 139:25, 140:4</p> <p>tend ^[1] - 191:16</p> <p>tender ^[3] - 230:7, 232:10, 232:12</p> <p>tendering ^[1] - 232:2</p> <p>tenders ^[3] - 231:14, 231:15, 232:4</p> <p>term ^[2] - 125:9, 125:14</p> <p>terminology ^[1] - 260:20</p> <p>terminus ^[1] - 252:6</p> <p>terms ^[35] - 131:13, 132:12, 153:4, 156:4, 165:6, 170:22, 171:6, 175:20, 177:13, 178:13, 190:9, 190:19, 194:1, 196:12, 203:24, 206:17, 207:5, 208:18, 214:8, 231:3, 233:5, 233:18, 235:7, 235:16, 247:4, 247:5, 247:23, 248:23, 249:22, 252:23, 255:19, 263:4, 263:18, 266:9, 266:22</p> <p>terraces ^[2] - 210:5, 210:17</p> <p>terrible ^[2] - 172:20, 268:2</p> <p>testing ^[2] - 187:16, 223:7</p> <p>THAT ^[2] - 212:23,</p>	<p>271:18</p> <p>THE ^[71] - 124:9, 124:23, 125:19, 125:25, 126:11, 126:15, 126:19, 126:20, 126:21, 127:23, 128:14, 128:17, 128:19, 129:17, 129:20, 130:3, 141:25, 145:23, 146:6, 146:12, 146:16, 148:24, 153:6, 156:14, 156:20, 156:22, 157:5, 162:1, 162:7, 166:25, 175:1, 178:17, 184:21, 184:24, 185:6, 185:8, 185:11, 185:24, 186:2, 203:14, 212:22, 212:23, 213:4, 214:10, 215:4, 215:18, 216:4, 216:9, 216:17, 216:20, 216:25, 241:6, 241:16, 242:4, 242:11, 242:15, 242:21, 243:13, 243:19, 243:23, 244:2, 264:7, 264:10, 265:6, 266:3, 267:12, 269:7, 269:16, 271:10, 271:17</p> <p>therefore ^[1] - 235:10</p> <p>they've ^[3] - 132:5, 179:13, 210:2</p> <p>thick ^[2] - 266:21</p> <p>third ^[3] - 177:7, 188:17</p> <p>THIS ^[2] - 212:24, 271:18</p> <p>thousand ^[5] - 134:11, 134:13, 177:8, 191:4, 191:9</p> <p>thousand-year ^[2] - 191:4, 191:9</p> <p>threatening ^[1] - 173:16</p> <p>three ^[9] - 219:5, 245:14, 245:20, 245:22, 245:24, 245:25, 246:4</p> <p>three-day ^[2] - 245:20, 245:22</p> <p>threshold ^[1] - 149:24</p> <p>throat ^[1] - 219:19</p>
		T		
		<p>Table ^[7] - 132:3, 133:25, 167:6, 168:18, 174:4, 174:6, 240:3</p> <p>table ^[6] - 132:11, 134:7, 162:15, 162:18, 167:19, 245:4</p> <p>tables ^[2] - 167:16, 168:20</p> <p>tall ^[2] - 222:18, 224:5</p>		

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>throttle [1] - 157:25 throughout [3] - 170:25, 187:4, 224:8 tie [1] - 167:13 tied [2] - 213:13, 257:15 time-value-money [1] - 230:21 timeline [1] - 232:16 timelines [2] - 165:3, 231:14 timely [1] - 206:16 tip [1] - 174:21 TO [3] - 212:22, 269:22, 271:17 today [8] - 183:13, 194:11, 200:3, 207:20, 231:9, 239:23, 264:17, 267:17 toe [5] - 222:18, 222:20, 223:1, 224:21, 225:16 together [1] - 167:14 tomorrow [8] - 241:24, 265:10, 265:15, 265:17, 267:15, 267:24, 269:14, 269:18 tonight [2] - 267:23, 268:23 took [3] - 169:22, 246:5, 246:22 top [7] - 128:3, 220:3, 223:2, 224:17, 229:7, 266:24, 268:21 Topic [2] - 125:5, 265:1 total [10] - 169:12, 225:11, 230:9, 230:23, 245:15, 245:16, 245:22, 258:1, 266:9 totality [2] - 240:5, 240:19 totals [1] - 168:21 towards [4] - 141:1, 145:5, 145:13, 207:2 town [2] - 177:24, 178:5 Township [6] - 253:5, 253:12, 254:2, 254:24, 255:6, 259:3 township [1] - 255:1 tracking [3] - 214:9, 267:15, 267:16 trade [1] - 195:18 trade-off [1] - 195:18 trails [1] - 198:8</p>	<p>TransAlta [1] - 148:17 transcribed [1] - 270:6 transcribing [1] - 126:14 Transcript [1] - 270:1 transcript [2] - 265:25, 270:4 transcripts [1] - 267:14 transition [1] - 247:17 transitions [1] - 251:25 transmission [2] - 260:11, 260:16 Transportation [30] - 123:16, 124:22, 125:3, 141:17, 142:12, 145:20, 150:3, 150:23, 151:3, 151:13, 151:19, 152:8, 178:6, 184:15, 184:23, 189:20, 189:22, 190:2, 190:14, 190:22, 194:14, 195:1, 197:4, 197:7, 211:18, 212:5, 231:22, 251:6, 255:22, 271:8 Transportation's [3] - 145:10, 206:13, 228:12 transported [1] - 191:11 trap [2] - 186:11, 190:21 travel [2] - 192:23, 193:1 travelling [1] - 244:21 treat [1] - 191:25 treatment [1] - 152:6 Treatment [2] - 152:12, 152:19 trees [7] - 174:14, 186:12, 190:21, 191:6, 194:6, 196:5, 196:11 trench [1] - 257:11 tributaries [2] - 139:21, 168:2 tributary [2] - 163:24, 167:19 tried [1] - 261:15 triple [1] - 177:25 trout [2] - 195:22, 196:2 true [7] - 160:22, 164:2, 165:10, 194:18, 233:7,</p>	<p>233:10, 233:24 try [2] - 130:4, 268:22 trying [5] - 169:6, 239:19, 240:25, 264:11, 266:17 Tsuut'ina [1] - 237:9 tube [1] - 169:4 tunnel [5] - 133:5, 133:25, 134:8, 134:12, 134:25 turn [17] - 129:4, 129:9, 136:20, 142:13, 146:2, 151:9, 152:25, 155:5, 157:1, 178:22, 181:19, 194:4, 196:16, 217:8, 249:22, 253:6, 257:12 turned [1] - 217:10 turning [1] - 219:14 two [27] - 124:16, 127:10, 129:18, 129:20, 154:22, 158:6, 165:14, 165:15, 167:11, 170:19, 175:5, 175:18, 183:13, 183:20, 209:3, 209:5, 213:1, 214:12, 217:1, 225:14, 226:15, 239:14, 239:20, 241:2, 244:8, 262:14, 263:9 two-day [1] - 158:6 two-year [1] - 262:14 type [5] - 176:24, 205:20, 246:10, 254:8 types [1] - 132:5 typical [5] - 189:19, 189:24, 190:2, 222:14, 222:22 typically [5] - 157:22, 181:10, 181:15, 190:5, 256:17</p>	<p>unconstrained [1] - 148:3 unconversant [1] - 263:6 under [20] - 125:23, 127:8, 131:22, 140:11, 144:6, 144:14, 153:8, 153:9, 189:18, 190:7, 198:4, 210:10, 224:22, 231:19, 234:9, 234:11, 234:15, 249:24, 252:20, 257:2 undergo [1] - 191:12 underlying [4] - 223:19, 223:20, 223:24, 261:23 undermining [1] - 219:9 underneath [1] - 165:25 underpin [1] - 190:8 undersigned [1] - 270:3 undertake [3] - 212:14, 254:15, 255:18 undertaken [1] - 179:14 undertaking [7] - 212:21, 214:7, 214:8, 258:14, 265:18, 265:19, 267:14 UNDERTAKING [2] - 212:22, 271:17 UNDERTAKINGS [1] - 271:15 undertakings [3] - 214:5, 243:16, 243:24 underway [2] - 182:2, 251:4 unforeseen [1] - 172:23 UNIDENTIFIED [1] - 242:14 unique [1] - 158:2 unit [1] - 231:7 United [1] - 171:13 unless [3] - 228:5, 242:22, 258:9 unlined [1] - 251:15 unmitigated [2] - 237:18, 238:5 unmute [1] - 216:5 Unnamed [7] - 226:5, 226:19, 226:25,</p>	<p>240:1, 248:19, 249:8, 249:14 unnamed [1] - 240:17 up [74] - 124:15, 124:17, 127:12, 134:17, 136:20, 142:14, 146:1, 146:2, 148:5, 149:12, 151:9, 153:5, 156:17, 157:1, 157:20, 160:8, 162:4, 162:25, 164:12, 164:20, 166:16, 174:3, 174:20, 178:23, 180:20, 185:13, 185:23, 186:3, 190:17, 191:11, 192:18, 194:5, 196:16, 199:20, 202:16, 203:10, 210:17, 214:11, 214:13, 215:4, 215:8, 215:11, 215:14, 216:1, 216:4, 216:10, 216:11, 216:16, 217:9, 217:10, 220:1, 223:22, 223:23, 226:16, 228:2, 229:6, 230:2, 235:10, 243:5, 250:13, 250:15, 250:17, 253:3, 259:11, 261:22, 263:1, 264:8, 266:1, 266:25, 267:11, 267:20, 268:1, 268:4 update [1] - 230:1 updated [3] - 146:20, 212:15, 255:16 updates [1] - 253:5 upgrades [3] - 253:13, 254:7, 255:6 upgrading [1] - 252:23 upland [1] - 227:13 upper [1] - 210:6 upstream [27] - 137:2, 137:20, 137:24, 138:21, 138:22, 139:6, 139:14, 142:16, 143:12, 144:2, 166:13, 166:14, 167:9, 167:10, 178:2, 184:2, 192:22, 192:23, 193:2, 198:6, 198:12,</p>
		U		
		<p>ultimate [1] - 252:9 ultimately [13] - 181:21, 188:5, 188:19, 188:24, 189:18, 204:24, 208:11, 221:13, 225:13, 231:25, 243:4, 243:5, 252:18 unclear [1] - 125:8 uncomparable [1] - 172:24</p>		

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>207:10, 209:10, 222:19, 226:16, 233:12 upwards [1] - 247:12 useful [2] - 217:18, 236:24 uses [3] - 160:11, 164:20, 229:21 utilities [2] - 259:14, 260:10 Utility [1] - 258:4 utility [1] - 260:14 utilize [1] - 173:22 utilized [3] - 193:6, 205:17, 254:5 utilizes [1] - 226:7</p>	<p>126:23, 270:10, 270:11 Via [1] - 122:22 Victoria [2] - 148:6, 149:14 video [1] - 176:13 videoconferencing [1] - 122:22 View [14] - 178:6, 179:12, 180:1, 184:11, 190:10, 208:13, 208:17, 210:1, 211:25, 212:9, 237:1, 237:2, 239:11, 239:23 views [1] - 178:3 Village [1] - 147:3 village [1] - 237:9 virtually [1] - 123:2 voice [3] - 126:3, 126:8, 214:18 voices [1] - 126:24 volume [21] - 150:21, 155:9, 155:17, 156:3, 157:18, 158:12, 159:17, 159:19, 159:23, 160:17, 169:12, 169:18, 169:25, 170:6, 171:9, 179:4, 180:18, 181:16, 205:17, 245:16, 245:22 Volume [3] - 122:19, 123:4, 161:22 VOLUME [1] - 271:3 volumes [20] - 150:16, 153:4, 153:24, 154:6, 154:8, 154:15, 154:19, 155:25, 158:8, 158:10, 159:11, 160:14, 167:8, 169:12, 170:3, 174:4, 176:3, 245:4, 267:1, 267:2</p>	<p>water [49] - 144:6, 144:14, 149:11, 150:16, 150:21, 150:23, 150:24, 151:3, 151:7, 151:8, 151:15, 152:5, 152:6, 152:14, 152:17, 152:24, 156:7, 158:17, 159:23, 163:1, 163:7, 163:10, 167:23, 173:19, 180:4, 189:11, 195:5, 195:13, 200:3, 200:6, 200:14, 201:2, 204:19, 205:14, 207:2, 223:19, 223:22, 246:19, 247:19, 252:8, 261:7, 261:19, 261:25, 262:16, 264:3, 266:8 Water [3] - 152:12, 152:19, 251:6 water's [1] - 266:25 waterfowl [2] - 195:5, 195:13 waters [1] - 132:19 watershed [4] - 151:20, 152:9, 174:7, 248:10 Waterworks [1] - 124:3 wave [11] - 261:20, 262:2, 262:7, 262:15, 262:19, 262:24, 263:2, 263:3, 264:12, 266:5, 266:23 waves [1] - 263:2 Wayne [7] - 161:14, 162:13, 162:16, 167:13, 201:10, 239:17, 244:6 ways [4] - 256:14, 256:17, 256:20, 258:20 weather [1] - 171:12 weight [2] - 223:18, 223:21 weirs [3] - 219:5, 219:7 Weisbach [1] - 123:13 welcome [1] - 243:10 WERE [2] - 212:23, 271:18 west [2] - 259:2, 263:14 whatever's [1] -</p>	<p>131:19 WHEN [2] - 212:22, 271:17 whoa [3] - 229:12, 229:13 whole [2] - 246:16, 250:23 wide [2] - 252:7, 256:18 widened [2] - 191:15, 191:22 widespread [1] - 138:4 width [3] - 223:2, 252:5, 252:6 WIEBE [11] - 215:13, 215:16, 216:2, 216:6, 216:15, 268:8, 268:13, 268:16, 268:20, 268:25, 269:20 Wiebe [4] - 123:15, 185:11, 215:19, 269:19 wildlife [1] - 194:9 William [1] - 123:10 Williams [4] - 124:3, 269:8, 269:10, 269:11 willing [2] - 241:19, 241:22 wind [9] - 262:15, 262:20, 262:25, 263:1, 263:8, 263:11, 264:12 wind-driven [1] - 262:15 winds [4] - 263:10, 263:19, 264:1, 264:4 wintering [2] - 195:6, 195:14 wiped [1] - 177:23 WITH [2] - 212:24, 271:18 withstand [2] - 173:10, 262:7 witness [2] - 127:17, 202:24 witnesses [2] - 202:11, 211:19 Woloshyn [1] - 123:7 wondering [4] - 156:15, 204:8, 214:5, 215:5 wood [17] - 125:18, 129:24, 133:21, 140:2, 142:17, 144:5, 148:22, 148:24, 150:1, 159:12, 176:16,</p>	<p>180:22, 187:1, 192:5, 192:18, 204:6, 209:7 WOOD [70] - 124:20, 125:20, 128:8, 128:13, 128:16, 128:18, 128:25, 129:8, 129:13, 130:12, 131:8, 131:11, 131:17, 132:10, 132:16, 132:25, 133:4, 133:19, 134:2, 134:11, 134:23, 135:3, 135:12, 135:17, 135:23, 136:6, 136:12, 136:16, 137:7, 137:13, 137:25, 138:12, 138:25, 139:10, 139:19, 140:3, 141:8, 141:15, 141:22, 142:19, 144:9, 144:15, 144:21, 145:1, 145:7, 148:25, 149:15, 150:8, 154:20, 155:21, 172:4, 175:9, 180:25, 183:4, 183:11, 184:17, 184:22, 187:3, 190:25, 191:7, 192:11, 192:24, 197:24, 198:10, 199:18, 200:9, 204:1, 204:12, 209:12, 271:7 Wood [11] - 125:19, 128:16, 130:8, 132:15, 134:21, 143:3, 148:9, 167:15, 176:9, 184:22 woods' [1] - 140:8 word [4] - 125:3, 133:21, 151:18, 234:5 words [1] - 156:7 works [11] - 143:18, 157:17, 190:2, 226:1, 226:4, 227:11, 227:21, 248:24, 249:5, 249:7, 249:18 worse [1] - 191:4 worst [1] - 252:9 worst-case [1] - 252:9 worth [1] - 125:1</p>
V				
<p>v-weirs [3] - 219:5, 219:7 valley [2] - 209:24, 226:5 Valley [5] - 151:20, 233:6, 233:9, 238:18, 239:8 valleys [1] - 180:3 value [6] - 196:12, 198:15, 205:19, 230:21, 233:3, 248:8 values [1] - 248:7 Vance [3] - 123:10, 214:21, 216:10 variable [1] - 226:24 varies [3] - 189:25, 252:4, 260:6 Various [1] - 136:22 various [6] - 138:1, 147:5, 154:10, 176:7, 183:14, 191:12 vast [1] - 174:15 vegetation [1] - 194:7 vegetative [2] - 261:23, 262:4 velocities [1] - 169:7 velocity [1] - 191:17 verbatim [1] - 132:17 verbatim [1] - 199:10 verify [1] - 215:10 verse [1] - 171:8 versus [8] - 157:10, 164:22, 166:1, 166:14, 169:3, 225:8, 233:22, 268:22 Versus [1] - 127:21 vertical [3] - 222:17, 222:25, 224:21 Vespa [4] - 124:5,</p>				
	W			
	<p>Wagner [4] - 124:4, 269:4, 269:13 wait [1] - 267:13 waiting [1] - 156:14 Walter [1] - 123:8 wants [1] - 202:10 warranted [1] - 129:14 wash [3] - 193:14, 261:21 washed [2] - 190:13, 190:24</p>			

NRCB 1701, Volume 1 Afternoon Session, March 22, 2021

<p>wrap ^[5] - 214:11, 214:13, 264:8, 266:1, 267:11 wrap-up ^[1] - 266:1 wrapped ^[1] - 124:17 write ^[1] - 265:22 writes ^[1] - 228:6 written ^[1] - 146:5 wrote ^[1] - 189:7</p>
Y
<p>year ^[13] - 139:18, 139:25, 140:4, 165:2, 172:7, 177:8, 191:4, 191:9, 231:13, 232:3, 261:3, 262:14 years ^[8] - 164:1, 175:6, 178:15, 213:1, 255:13, 260:23, 263:9 yesterday ^[1] - 127:11 yourself ^[1] - 142:1 Yvonne ^[1] - 253:10</p>
Z
<p>Zoo ^[1] - 147:4 Zoom ^[2] - 215:12, 218:8</p>