



MANITOBA PUBLIC UTILITIES BOARD

Re:

MANITOBA HYDRO
NEEDS FOR AND ALTERNATIVES TO
REVIEW OF MANITOBA HYDRO'S
PREFERRED DEVELOPMENT PLAN

Regis Gosselin	- Chairperson
Marilyn Kapitany	- Board Member
Larry Soldier	- Board Member
Richard Bel	- Board Member
Hugh Grant	- Board Member

HELD AT:

Public Utilities Board
400, 330 Portage Avenue
Winnipeg, Manitoba
April 9, 2014
Pages 6014 to 6320

	APPEARANCES	
1		
2	Bob Peters) Board Counsel
3	Sven Hombach	
4		
5	Patti Ramage) Manitoba Hydro
6	Marla Boyd)
7	Douglas Bedford (np))
8	Helga Van Iderstine (np))
9	Jennifer Moroz)
10		
11	Byron Williams) CAC
12		
13	William Gange) GAC
14	Peter Miller (np))
15		
16	Antoine Hacault) MIPUG
17		
18	George Orle) MKO
19	Michael Anderson (np))
20		
21	Jessica Saunders) MMF
22	Corey Shefman (np))
23		
24	Christian Monnin) IEC
25	Michael Weinstein)

1	TABLE OF CONTENTS	
2		Page No.
3	List Exhibits	6017
4		
5	IEC LA CAPRA ASSOCIATES PANEL CONTINUED:	
6	DANIEL PEACO, Previously Affirmed (Qual.)	
7	JOHN ATHAS, Previously Affirmed (Qual.)	
8	MARY NEAL, Previously Affirmed	
9	Continued Cross-examination	
10	by Mr. Antoine Hacault	6020
11	Cross-examination by Mr. George Orle	6113
12	Cross-examination by Ms. Jessica Saunders	6117
13		
14	Presentation by Dr. Peter Kulchyski	6133
15		
16	IEC LA CAPRA ASSOCIATES PANEL CONTINUED:	
17	DANIEL PEACO, Previously Affirmed	
18	JOHN ATHAS, Previously Affirmed	
19	MARY NEAL, Previously Affirmed	
20	Cross-examination by Ms. Patti Ramage	6151
21	Cross-examination by Ms. Jennifer Moroz	6250
22	Cross-examination by Ms. Marla Boyd	6264
23		
24	Certificate of Transcript	6320
25		

6017

1	LIST OF EXHIBITS		
2	EXHIBIT NO.	DESCRIPTION	PAGE NO.
3	MIPUG-22-1	IR of La Capra by MIPUG	6019
4	MIPUG-22-2	IR of La Capra by MIPUG	6019
5	MIPUG-22-3	IR of La Capra by MIPUG	6020
6	MIPUG-22-4	IR of La Capra by MIPUG	6020
7	MIPUG-22-5	IR of La Capra by MIPUG	6020
8	MIPUG-22-6	IR of La Capra by MIPUG	6020
9	MIPUG-22-7	IR of La Capra by MIPUG	6020
10	MIPUG-22-8	IR of La Capra by MIPUG	6020
11	MIPUG-22-9	IR of La Capra by MIPUG	6020
12	MIPUG-22-10	IR of La Capra by MIPUG	6020
13	MIPUG-22-11	IR of La Capra by MIPUG	6020
14	MIPUG-22-12	IR of La Capra by MIPUG	6020
15	LCA-48	Errata sheet	6133
16	MH-166	Response to Undertaking 79	6149
17	MH-104-10	Further information on the economic	
18		evaluation update	6150
19	MH-167-1	First volume of Manitoba Hydro's	
20		book of documents identified as LCA	
21		Volume I	6151
22	MH-167-2	Volume II	6151
23	MH-167-3	Volume III	6152
24			
25			

1 --- Upon commencing at 9:00 a.m.

2

3 THE CHAIRPERSON: Well, I think we'd
4 like to start the proceedings. I believe that
5 everyone's in position. I wonder if there are any
6 documents to acknowledge; apparently not. So with
7 that, I'll turn the microphone over to you, Me.
8 Hacault, s'il vous plait.

9 MR. ANTOINE HACAULT: Bonjour, M.
10 President. We do have one (1) set of documents which
11 were not marked. They are IRs of MIPUG -- or of La
12 Capra by MIPUG. And I believe, in consultation with
13 the Board secretary, that they can be marked as MIPUG
14 Exhibit 22. They have been posted on the website. And
15 there were twelve (12) questions. So I think they're
16 going to put them one (1), two (2), three (3), up to
17 twelve (12). So it will be MIPUG Exhibit 12.

18 MR. KURT SIMONSEN: Exhibit 22 --

19 MR. ANTOINE HACAULT: Oh, twenty-two
20 (22).

21 MR. KURT SIMONSEN: 1 to 12.

22

23 --- EXHIBIT NO. MIPUG-22-1: IR of La Capra by MIPUG

24

25 --- EXHIBIT NO. MIPUG-22-2: IR of La Capra by MIPUG

1 --- EXHIBIT NO. MIPUG-22-3: IR of La Capra by MIPUG

2

3 --- EXHIBIT NO. MIPUG-22-4: IR of La Capra by MIPUG

4

5 --- EXHIBIT NO. MIPUG-22-5: IR of La Capra by MIPUG

6

7 --- EXHIBIT NO. MIPUG-22-6: IR of La Capra by MIPUG

8

9 --- EXHIBIT NO. MIPUG-22-7: IR of La Capra by MIPUG

10

11 --- EXHIBIT NO. MIPUG-22-8: IR of La Capra by MIPUG

12

13 --- EXHIBIT NO. MIPUG-22-9: IR of La Capra by MIPUG

14

15 --- EXHIBIT NO. MIPUG-22-10: IR of La Capra by MIPUG

16

17 --- EXHIBIT NO. MIPUG-22-11: IR of La Capra by MIPUG

18

19 --- EXHIBIT NO. MIPUG-22-12: IR of La Capra by MIPUG

20

21 IEC LA CAPRA ASSOCIATES PANEL CONTINUED:

22 DANIEL PEACO, Previously Affirmed

23 JOHN ATHAS, Previously Affirmed

24 MARY NEAL, Previously Affirmed

25

1 CONTINUED CROSS-EXAMINATION BY MR. ANTOINE HACAULT:

2 MR. ANTOINE HACAULT: Now, if Diane
3 could please put Manitoba Hydro Exhibit 104-8, that was
4 the quilt. And we were talking -- yesterday about how
5 different plans fared. And we had been talking,
6 comparatively, quite a bit about how six (6) plan --
7 Plan 6 fared with others.

8 But in the context of integrated
9 planning --

10 THE CHAIRPERSON: Me. Hacault, just
11 situate this grid -- this quilt for us, please, in
12 terms of --

13 MR. ANTOINE HACAULT: Yes.

14 THE CHAIRPERSON: -- this represents
15 the updated capital costs.

16

17 CONTINUED BY MR. ANTOINE HACAULT:

18 MR. ANTOINE HACAULT: There's two (2)
19 things that -- this quilt is part -- is the latest
20 update that Manitoba Hydro has provided, March 27. And
21 it has information that was a bit more recent than the
22 update on which La Capra relied. And we spent quite a
23 bit of time yesterday with this slide. It has the
24 revised capital costs. It has the revised treatment of
25 common factors.

1 And the last thing that it did, which La
2 Capra's analysis did not have, if you look in the upper
3 right-hand side, it has, "No WPS investment," whereas
4 La Capra's analysis still had the WPS investment.

5 The -- with that kind of preface as an
6 explanation, the one thing I want to explore a little
7 bit and have thoughts on is optionality. We've had
8 some discussion with prior panels on what the 750 line
9 might give, in addition to the 250 line, even though
10 the economics aren't as good on this quilt.

11 If, as a hypothetical, we were going to
12 choose Development Plan 6, can La Capra comment on any
13 optionality that, that gives us? What flexibility does
14 it give us if export prices move, capital costs move.

15 What advantages and disadvantages do we
16 have with choosing that as, kind of, our first step and
17 where it might lead us to different paths?

18 MR. DANIEL PEACO: You want it in
19 comparison to anything else in particular, or...

20 MR. ANTOINE HACAULT: Well, let's
21 compare six (6) to -- to two (2). If we just said
22 we're going to do Keeyask/Gas, but now we're going to
23 six (6), what kind of optionality is foreclosed and
24 what is open for us, as Manitoba ratepayers?

25 MR. DANIEL PEACO: Okay. Well, let's

1 start -- let's start with the transmission component of
2 that, because I think that's probably where the -- I
3 mean, if you build Keeyask, it's -- it's there. So
4 then the question is: What flexibility do you have to
5 operate around that?

6 The -- as we -- as we've spoken about
7 here in the last couple days, some of the analysis that
8 we've -- that we've looked at shows that even if you --
9 you go into something like Plan 14, the existence of --
10 of the added import capability provides more access to
11 the market, which effectively serves as a -- as another
12 hedging option in drought condition with the system.

13 And so that -- that gives more options
14 to manage dry water conditions in the -- in the hydro
15 system than -- than exist today. I think to the extent
16 that -- obviously, that would provide -- the 750 line,
17 having built only Keeyask, will clearly give some
18 export headroom in the system so that -- to the extent
19 that there is any kind of additional facilities that --
20 that were built to try to export into the market, into
21 MISO, obviously, that would already exist, whether it's
22 Conawapa or something else. So that would be some --
23 some optionality, again, relative to the -- to the
24 export market opportunities.

25 But in terms of domestic load, I think

1 to the extent that there are attractive sources of
2 power available to be imported from the south, that
3 clearly would expand the import capability quite a bit.
4 So there would be expanded opportunities to take
5 advantage of anything that might be more lucrative to
6 the south.

7 MR. ANTOINE HACAULT: Thank you.

8 THE CHAIRPERSON: I noticed that you
9 didn't mention any transmission revenues from that line
10 that would originate for -- in relation to traffic in
11 the US?

12 MR. DANIEL PEACO: Yeah, I -- and I
13 guess I would think about more how that sort of fits
14 into the -- the optionality question that he posed.
15 There probably would be some. I'm not sure how much it
16 would change, depending upon what kinds of options you
17 exercised.

18 THE CHAIRPERSON: But I meant operating
19 purely as a transmission line in the US as opposed to
20 using it as a vehicle for power that would be
21 travelling to Manitoba either way, or from Manitoba or
22 to Manitoba.

23 In other words, there are people that
24 invest in transmission lines in the US simply for --

25 MR. DANIEL PEACO: Sure.

1 THE CHAIRPERSON: -- merchant
2 transmission purposes.

3 MR. DANIEL PEACO: Sure. But I think
4 the -- the investment would be -- it would -- it would
5 presumably be part of the network tariff, and you'd get
6 a -- you'd get a return. I mean, typical investment in
7 the US, if it was built for expanded diversity exchange
8 between two (2) areas of a system, I mean, it would --
9 it would deemed to be needed and included in the -- in
10 the network tariff. And -- and the owner would --
11 would get a return on that and -- and be able to charge
12 the fees. I'm not sure...

13 And I guess I'd have to go back and look
14 and see exactly how the US portion of this line would
15 be treated, but I would assume it would give some sort
16 of similar revenue. It would -- it would receive
17 revenues as being part of the network tariff.

18 I don't know how that would chan -- I'd
19 -- I'd have to look at it to see how that would change,
20 depending upon the mode of use of the line, depending
21 whether it's for import or export.

22

23 CONTINUED BY MR. ANTOINE HACAULT:

24 MR. ANTOINE HACAULT: Thank you. Now,
25 I'd like to keep in mind your comments with respect to

1 Development Plan 6 but contrast that with Plan 14,
2 which is the Preferred Development Plan now deferred
3 for Conawapa to '26. It doesn't show on here, but
4 that's my understanding. The earliest possible would
5 be at that date.

6 If we were in a hypothetical to choose
7 Plan 14, and we're talking again long-term risks and
8 long-term forecasts, what does choosing Plan 14 do to
9 our options?

10 MR. DANIEL PEACO: Relative to the
11 prior discussion?

12 MR. ANTOINE HACAULT: Yes.

13 MR. DANIEL PEACO: Well, with Keeyask
14 and Conawapa, you're, at least initially, you -- you
15 have substantial surplus in Manitoba, and the 750 line
16 is basically sized to be able to export the power
17 that's going to be produced from those two (2)
18 facilities in excess of domestic load.

19 It wouldn't, by itself -- my
20 understanding is even with a -- with a bit of an
21 upgrade that's contemplated with the line, it wouldn't
22 provide a lot of additional opportunity for further
23 generation to export. So -- because the -- the line is
24 basically sized to be big enough to evacuate power --
25 surplus power from both of those facilities during

1 reasonably high water conditions.

2 So -- but I do think that the -- the
3 drought -- the drought uses the line as a -- as a
4 source of imports during drought conditions, which
5 still apply, and we've -- we've talked about that.

6 MR. ANTOINE HACAULT: Yes. Now, let me
7 just test this a bit, because we've seen versions of
8 Plan 14 with deferring Conawapa, because as I
9 understand the evidence so far, we don't need to make a
10 decision to build Conawapa today. We still have some
11 flexibility based on the contracts in postponing that -
12 - the real decision for another four (4) years.

13 If Conawapa is approved now, am I right,
14 firstly, that we'll be stuck with the capital costs
15 without knowing whether or not Keeyask proves that
16 those capital costs as estimated were accurate, too
17 low, or too high?

18 MR. DANIEL PEACO: Yeah, I -- I guess
19 I'm not sure that anybody's proposing that it be
20 approved now. If...

21 MR. ANTOINE HACAULT: Well, I guess,
22 what's your understanding of Hydro's Preferred
23 Development Plan? What's their first -- their first
24 choice? Is it still what's shown on this slide, which
25 is K19 -- it's Keeyask19, Conawapa26, and then -- and

1 the 750 line with the WPS sale, but no WPS investment?

2 MR. DANIEL PEACO: Well, I -- it was my
3 understanding in reading the -- the oral testimony
4 provided and the materials that have come along with
5 that, that the Company has -- has basically set aside
6 Conawapa for the time being, realizing that that's --
7 they said that's an option. We can do it later, but
8 we're not -- you know, it's not necessarily something
9 that we're asking for approval for now.

10 And my understanding of their testimony
11 essentially brings them back to something that looks
12 like five (5) or six (6) with a -- with the DSM at.
13 They're asking for the -- they're asking for the
14 Keeyask, the -- the 750 line, the Minnesota Power
15 contract, and then we'll, you know, we'll -- we'll
16 defer further decisions till later.

17 MR. ANTOINE HACAULT: And does that
18 make sense for La Capra? Does it make sense to wait on
19 the Conawapa decision to see whether we are able to
20 negotiate more contracts, what's happening with
21 construction costs, and what's happening with export
22 prices?

23 Does it make sense to defer the decision
24 on Conawapa?

25 MR. DANIEL PEACO: Well, I think it was

1 always -- I mean, obviously, Conawapa's on a different
2 -- has always been on a different timeline than
3 Keeyask, and is -- inherently that -- that gives --
4 gives anyone different options, because if you're not -
5 - if you're not in the construction phase, or you
6 haven't -- you haven't spent as much money, you have --
7 you have more flexibility to change direction.

8 My understanding is that based upon what
9 was learned about -- about the cost of the project and
10 the -- and the economics environment within which to
11 look at that project, that it would say, We need to
12 make sure we exercise that option, because we could
13 learn in a few years that the markets turn in one (1)
14 direction, and Conawapa looks more attractive, or -- or
15 learn on the converse that it looks, you know, that the
16 -- what -- what looks to be fairly unattractive
17 economics persist.

18 And I think those -- that information
19 would be updated and considered at the time it -- it's
20 ripe to make a decision on the project. I'm -- I'm not
21 hearing Hydro indicate anything different than that.

22 MR. ANTOINE HACAULT: And, sir, from a
23 resource planning perspective, is it La Capra's view
24 that Hydro should continue to expend the minimum it
25 needs to expend to continue to protect the Conawapa

1 plan, or are the econ -- economics such that we should
2 just say, Well, for the next four (4) or five (5)
3 years, until something does change, it's not even
4 worthwhile spending some minimum protection money?

5 MR. DANIEL PEACO: Yeah. We -- we
6 haven't -- we haven't sort of dug into sort of the
7 tactics of what you do with Conawapa in the -- in the
8 next few years. I think what we've gotten to here is
9 the -- so the economic piece is there's a -- there's a
10 decent likelihood that at least the deferral of that
11 project is -- is going to make sense, particularly when
12 you combine the economic change, the cost change, the
13 DSM program.

14 How Hydro decides to manage the Conawapa
15 option going forward is -- is not something we really
16 looked at, but I'm sure that they'll be developing a
17 plan for that.

18 MR. ANTOINE HACAULT: And when you talk
19 about economics, sir, the next document I'd like to
20 draw your attention to is Appendix 9B, which is marked
21 as Exhibit 12-1, and in particular the discussion that
22 starts at page 89 of -- of that part of your report.

23 We've had Potomac testify with respect
24 to its views. As Intervenors, we weren't in the
25 commercially sensitive information part, but I'd like

1 to have a bit of discussion with respect to this part
2 of the analysis in your report and how it might impact
3 the updated information.

4 So blacked out, it starts:

5 "In other words, the MH price --
6 price forecast..."

7 And then it's blanked out for CSI. And
8 it continues:

9 "The high Manitoba Hydro price
10 forecast was not on the Potomac curve
11 and is assumed to be impossible."

12 Does La Capra adopt the view of Potomac?

13 MR. JOHN ATHAS: We have not had to
14 make that decision.

15 MR. ANTOINE HACAULT: Okay. So here,
16 you're just basically relying on the input information
17 that you've received for Potomac, and -- and La Capra
18 hasn't come to an independent conclusion that?

19 MR. JOHN ATHAS: That's correct.

20 MR. ANTOINE HACAULT: And you're
21 reporting here that the low and reference points were
22 assigned a 50 percent probability each.

23 Who decided that probability? Was it
24 Potomac or was it La Capra?

25 MR. JOHN ATHAS: That was -- that was

1 La Capra.

2 MR. ANTOINE HACAULT: Okay. So help me
3 understand here. If I'm La Capra and I'm assigning 50
4 percent probability to low and 50 percent probability
5 to reference, is La Capra -- are you making a judgment
6 call?

7 MR. JOHN ATHAS: Well, in this case,
8 it's a -- it's a mathematical exercise. We took the --
9 one (1) of the benefits of the uncertainty analysis in
10 the way it was performed by -- you know, overall
11 performed by Manitoba Hydro and used by La Capra is if
12 your viewpoints change on -- on the -- an overall
13 distribution essentially of -- of power prices, you
14 could -- you could develop an equivalent to a new
15 almost S-curve profile based on that new opinion of
16 what the -- of -- of what that profile would -- those -
17 - those three (3) points from Potomac Economics.

18 Then the exercise would be to take the -
19 - to take the prices that you -- that you have full
20 analysis for and -- in the Manitoba Hydro work, and
21 figure out where those would fall on that cumulative
22 distribution. And then you would estimate from that
23 cumulative reading and the math of where that cumula --
24 those points falls on the cumulative distribution the -
25 - what probabilities -- what portions of the hundred

1 percent probability the three (3) forecasts should
2 have.

3 So it's a way to -- to derive different
4 probabilities and let you look at an expected value and
5 a profile with -- that would be based on new points
6 with the old analys -- old analysis data, having to
7 rerun that. It's one of this -- the -- the -- one (1)
8 of the strengths of this type of analysis.

9 MR. ANTOINE HACAULT: So can I
10 translate that into you're stress testing some of the
11 parameters?

12 MR. JOHN ATHAS: I -- I wouldn't call
13 it stress testing. I'd call it -- I'd call it updating
14 the -- using a new perspective for market prices, and
15 instead of having the ability to then choose three (3)
16 different -- those market price forecasts, running them
17 through all the modelling and having three (3) points
18 to then be put into the new -- new S-curves, new
19 quilts, and all that.

20 It would -- the approximation of that
21 could be by assigning the probabilities from that --
22 from that new cumulative energy price distribution to
23 the old modelling runs, the original modelling runs.
24 And then -- and then -- so it's just -- so you get the
25 same effect of redoing the analysis by just adjusting

1 the probabilities from the old modelled points.

2 MR. ANTOINE HACAULT: Okay. Now, let
3 me back -- get back to a pretty fundamental question.
4 The report, as we see later on, did the S-curves using
5 the 50/50 probability and using Potomac's information,
6 correct?

7 MR. JOHN ATHAS: Assigning the -- using
8 Potomac's information to derive the 50/50
9 probabilities, and then using the original analysis.

10 MR. ANTOINE HACAULT: Okay. And does
11 La Capra still view that as an appropriate metric today
12 in light of, I'm going to say, Manitoba Hydro's view is
13 that export prices have been better and they've
14 reflected in updates?

15 So my question to you is: Given the
16 updated information, is this still an appropriate
17 metric and are the graphs that we're going to look at
18 still an appropriate metric?

19 MR. JOHN ATHAS: They are an
20 appropriate metric by -- by definition. The degree of
21 reveal -- relevance of the -- of that metric and how it
22 weights in with other metrics is the -- part of the
23 decision-making process for the -- for the PUB panel.

24 MR. ANTOINE HACAULT: Yes, understood.
25 So if we turn to the next page, page 90, as I

1 understand your response, Mr. Athas, these new S-curves
2 have been done with Manitoba Hydro 2012 information but
3 assigning the new probabilities as described in the
4 descriptive part below the graph.

5 Is that correct?

6 MR. JOHN ATHAS: That's correct.

7 MR. ANTOINE HACAULT: And if we go
8 further down the page, Diana, please. You've created a
9 short explanation of what choosing the different
10 probabilities, based on Potomac's view, might give us,
11 as far as impacts for different values when we compare
12 the Plan 14 to the All Gas case, correct?

13 MR. JOHN ATHAS: That's correct.

14 MR. ANTOINE HACAULT: And we see in the
15 top right-hand corner that the ref/ref/ref is not
16 affected. It still is where we had started when this
17 filing was made, at one billion six hundred and ninety-
18 six million (1,696,000,000), correct?

19 MR. JOHN ATHAS: That's correct.

20 MR. ANTOINE HACAULT: But where it does
21 materially change is in our expected value?

22 MR. JOHN ATHAS: That's correct.

23 MR. ANTOINE HACAULT: The -- just so we
24 can remind ourselves, so let's keep that number in our
25 head, a hundred and fifty-four (154) expected value

1 based on the original filing. Diana, could you bring
2 up our Volume XX-4 at page 17?

3

4 (BRIEF PAUSE)

5

6 MR. ANTOINE HACAULT: Oh, I must have
7 the wrong...

8

9 (BRIEF PAUSE)

10

11 MR. ANTOINE HACAULT: I guess my notes
12 had the wrong reference. I had the expected value in
13 the original quilts at one billion eighty-five mill --
14 million (1,085,000,000) factor, assuming the Manitoba
15 Hydro distribution probabilities.

16 MR. JOHN ATHAS: The equivalent -- the
17 equivalent that the number there would be actually
18 eleven fifty -- (1,050) -- one billion one hundred and
19 fifty-five million (1,155,000,000) because we take the
20 differences versus the -- versus the All Gas case. The
21 All Gas case is minus seventy (70), I believe, if you -
22 - if you check the expected value of that and the
23 Manitoba Hydro calculations.

24 MR. ANTOINE HACAULT: Okay. So --

25 MR. JOHN ATHAS: We're talking about

1 our table.

2 MR. ANTOINE HACAULT: Okay. So they're
3 redistributing the probabilities according to Potomac
4 lowers our expected value, even on the original filing
5 by about a billion dollars?

6 MR. JOHN ATHAS: That -- that's
7 correct.

8 MR. ANTOINE HACAULT: Do you have any
9 sense, sir, with the updated information that we've
10 looked at, and that's before all the DSM, that was our
11 updated quilt -- oh, sor -- thank you very much. So
12 it's been brought up on the screen. It was page 11 and
13 not page 17. My handwriting wasn't great.

14 And we see, as you've explained, sir, on
15 the left-hand side, All Gas was at minus seventy (70),
16 and the expected value of Plan 14 was one billion
17 eighty-five (1,085,000,000).

18 So what you've done is you've added the
19 seventy (70) to the one billion eighty-five
20 (1,085,000,000) to come to one billion one hundred and
21 fifty-five (1,155,000,000), and contrasted that with
22 the one hundred and fifty-four (154), correct?

23 MR. JOHN ATHAS: That's correct.

24 MR. ANTOINE HACAULT: Sir, my question
25 to you now was have you run what the expected value

1 would be using the 50:50 probability metric that you've
2 decided to use, based on Potomac's evidence as to what
3 that would do to the expected value, at least up to the
4 Exhibit 104-8 that we were looking at, which includes
5 revision for common costs, capital costs, and no WPS
6 investment?

7 MR. JOHN ATHAS: No, we have not.

8 MR. ANTOINE HACAULT: Okay. Would it
9 be something that would take very much time to run?

10

11 (BRIEF PAUSE)

12

13 MR. JOHN ATHAS: Just -- just to kind
14 of clarify, it wouldn't be some -- something that we
15 have to run as in models.

16 MR. ANTOINE HACAULT: Okay.

17 MR. JOHN ATHAS: It's something that we
18 would be estimating from -- from known numbers that are
19 outputs of the modelling that was -- were performed by
20 Manitoba Hydro. I -- I think it could be relatively
21 straightforward. If it's not relatively
22 straightforward, I can't do it. So it's -- it's either
23 easy or -- or not available to me at this time.

24 MR. ANTOINE HACAULT: Okay. Can I
25 suggest, then, that the undertaking be taken under

1 advisement as to whether or not Mr. Athas, being a
2 representative of La Capra, can reproduce the table
3 shown at Appendix 9B, page 90, but with the updated
4 information?

5 MR. CHRISTIAN MONNIN: We'll take that
6 under -- undertaking under advisement. What -- what --
7 what's at the forefront of that advisement is assuming
8 that La Capra has the information necessary to -- to
9 make that analysis.

10 MR. ANTOINE HACAULT: Thank you.

11 MR. JOHN ATHAS: And -- and just to
12 clarify, the -- my qualifier as 'easy' would be if I
13 can use the information that I -- that I used to -- to
14 make the addendum. There -- there has been additional
15 information come in. I have not had much time to look
16 at that at all. And so, you'd be starting from, kind
17 of, ground zero on that new information, and it
18 wouldn't be easy.

19 THE CHAIRPERSON: Let's try to attack
20 it without looking at data. You know, if you -- if you
21 have a base case, ref/ref/ref; you change it to
22 ref/ref/high for cap -- higher capital costs. Let's
23 start with that assumption: ref/ref/high capital costs.

24 And in terms of pricing, you -- you
25 remove the probabilities. You go to fifty (50) high,

1 fifty (50) reference.

2 That likely would -- would increase the
3 expected value of the outcome, wouldn't it?

4 MR. JOHN ATHAS: That's correct.

5 THE CHAIRPERSON: I mean, it's -- it's
6 just -- with a -- intuitively, just without doing any
7 data, you'd expect that by removing the probability of
8 low prices, you would get a higher expected outcome.

9 MR. JOHN ATHAS: I -- I suspect that
10 the -- the change in -- if remember the numbers, the
11 change in val -- the change in net present value for
12 going to the new capital cost estimates from the old
13 changed the Preferred Development Plan by, I believe,
14 \$898 million from the Manitoba Hydro presentation.

15 I think that on the seventy-eight (78)
16 year NPV, that's how this number would change. It
17 would be \$898 million lower than the one fifty-four
18 (154). But that's -- so if I get time to think about
19 it and see -- think to it -- figure out there's no
20 other issues that I haven't -- that I'd have to
21 calculate, I'll be able to -- I -- I'll probably get
22 comfortable that, that approximation is worth -- is
23 correct.

24

25 CONTINUED BY MR. ANTOINE HACAULT:

1 MR. ANTOINE HACAULT: Thank you very
2 much. And just to confirm, this 50/50 waiting, which
3 eliminates the -- any waiting on the high prices --
4 but, sorry, let's -- let's go back to 9B-90.

5 I think in the description there's a
6 reverse description that's put in Figure 9-178, based
7 on the paragraph that I -- that precedes it.

8 MR. JOHN ATHAS: Oh, I just noticed
9 that too. That's correct. It should be -- should be
10 zero, fifty (50), zero in the third line of the
11 caption.

12 MR. ANTOINE HACAULT: I just realized
13 that based on the -- the Chairperson's comments.

14 The discussion that precedes this graph
15 indicates that the zero probability is assigned to the
16 high prices, and 50 percent probability to references
17 prices, and 50 percent probability to low prices,
18 correct, Mr. Athas?

19 MR. JOHN ATHAS: That is correct.

20 THE CHAIRPERSON: Now, could we go back
21 to -- to see what the -- I thought it was the opposite.
22 I thought it was fifty (50) high, fifty (50)...

23

24 (BRIEF PAUSE)

25

1 THE CHAIRPERSON: Okay. So it's --
2 okay, this is the -- the Potomac situation. Okay, got
3 it.

4 MR. JOHN ATHAS: This is applying the -
5 - the -- essentially developing a -- a price profile on
6 the -- the Potomac estimates.

7

8 CONTINUED BY MR. ANTOINE HACAULT:

9 MR. ANTOINE HACAULT: And the Potomac
10 estimates that you're referring to are Potomac's best
11 information on what the likely prices are going to be?

12 MR. CHRISTIAN MONNIN: I don't think he
13 can answer to what -- what Potomac's best estimation
14 is. It comes from the report, and it says what it says
15 in the report.

16

17 CONTINUED BY MR. ANTOINE HACAULT:

18 MR. ANTOINE HACAULT: Okay. Well, was
19 the est -- did you take the low estimate, the high
20 estimate, or was -- was there a range that Potomac gave
21 you to choose from?

22 MR. DANIEL PEACO: To develop the
23 curve, we had to use the low, reference, and high that
24 they developed, or else we would have -- we just -- if
25 reference would only give us a point.

1 MR. ANTOINE HACAULT: Thank you. So
2 I've made that change in my materials to correct page
3 9B-90. Thank you, sir.

4 Now, I've taken other panels through,
5 what I'm going to say, lessons learned in the last six
6 (6) or seven (7) months, and whether our stress
7 testing, I'll call it, the highs and the lows were high
8 enough and low enough.

9 And I'd like to have a bit of that
10 discussion, because it seems to me nobody --
11 everybody's in agreement in this hearing that nobody's
12 going to be right on the forecast. To me, in that
13 context, I want to have a discussion about are -- are
14 we at least in agreement as to whether we're setting
15 the low parameters low enough and the high parameters
16 high enough so that we won't have some weird,
17 unexpected results.

18 So let me back up. There was an
19 application filed based on information in August of
20 last year. And we started with an NPV of close to \$1.7
21 billion. When La Capra looked at capital costs, it, in
22 its initial report, Exhibit 3-1, commented at page
23 2(I).

24 And the first -- there's a couple of
25 assumptions, and one of the assumptions at the very

1 bottom of this page, the last bullet:

2 "Manitoba Hydro assumes very little
3 uncertainty in the cost of Conawapa
4 and the associated transmission
5 facilities."

6 Were the metrics that were chosen --
7 where would the new estimates on capital costs lie with
8 respect to the stress testing?

9 MR. DANIEL PEACO: Are you asking about
10 the stress testing we did?

11 MR. ANTOINE HACAULT: Yes. We'll -- we
12 started with probabilities and S-curves and --

13 MR. DANIEL PEACO: Yeah.

14 MR. ANTOINE HACAULT: -- you know, high
15 --

16 MR. DANIEL PEACO: Well --

17 MR. ANTOINE HACAULT: -- capital costs,
18 low capital costs. And from August to when we did our
19 -- they did the Keeyask pricing and got some
20 information in, in December, there was a change. Some
21 people might argue whether it's significant or not.
22 It's -- it lead to about 8 or \$900 million --

23 MR. DANIEL PEACO: Right.

24 MR. ANTOINE HACAULT: -- in NPV
25 difference.

1 What can we learn from those three (3)
2 or four (4) months as to whether or not we're choosing
3 lows that are low enough and highs that are high
4 enough?

5 MR. DANIEL PEACO: Let me make a
6 comment, but I think probably Mr. Athas probably has an
7 answer to that. We -- the comment here goes to a
8 couple of things. I just want some background.

9 We did confer with Knight Piesold,
10 another independent expert that looks specifically at
11 the costs, and sort of took their mea -- took a measure
12 of their opinion as to what the capital costs estimates
13 look like. And from that, we structured the
14 sensitivity test in our -- in our modelling to sort of
15 postulate some alternative cost structures that were
16 broader than what we found in -- in the application.

17 And -- and I think that was sort of our
18 attempt, using our materials, to offer somewhat of a
19 stress test of that. And we've -- we've kind of
20 prepared that to what we now see as the -- the new cost
21 estimates.

22 I don't know, John, if you want to
23 explain that uncertainty and analysis and how it
24 relates to today.

25 MR. JOHN ATHAS: Yeah. I get -- just -

1 - let me comment on a couple of steps.

2 MR. ANTOINE HACAULT: And -- and please
3 continue to answer, but the question that I'm asking,
4 remember, is: Are we choosing the low low enough and
5 the high high enough?

6 It's not so much how the calculations
7 are made, but based on your observations of what Hydro
8 chose, are the -- when they choose high costs in their
9 metrics, and we saw the quilts, are we choosing a
10 number that's high enough based on what we know
11 happened in those three (3) or four (4) months?

12 MR. DANIEL PEACO: Yeah. I -- I think,
13 to -- to that specific question, we can offer -- we can
14 offer our observations. But I -- I think you've really
15 got to put the question to Knight Piesold, because
16 they're the ones that actually studied the cost
17 estimates and the -- the P50, P90 and whether --
18 whether the -- the range of cost uncertainty considered
19 was appropriate.

20 We -- we did not -- that was not in our
21 scope of work. We did not do that. So our -- our
22 perspective on that would be much less informed than
23 theirs.

24 MR. ANTOINE HACAULT: Understood. But
25 isn't one of your -- of La Capra's roles is to see

1 whether or not the analysis is robust, stands up to --

2 MR. DANIEL PEACO: That's --

3 MR. ANTOINE HACAULT: -- reasonable due
4 diligence?

5 And in the context of that, are you
6 saying that La Capra has no views and no opinions as to
7 whether or not we've chosen metrics that are high
8 enough and low enough as lows and highs?

9 MR. DANIEL PEACO: I guess what I'm --
10 let me try it again. We -- we have not specifically
11 reviewed the cost estimates for Conawapa. That was not
12 our scope of work. It was Knight Piesold's. In
13 structuring the analysis that we did to test the
14 robustness, we took advantage of their review and our
15 discussions with them to say, What kind of a range have
16 we looked that sort of covers what you see as the --
17 the types of uncertainty in the -- in the cost of the
18 facilities that we should be examining?

19 We wanted to make sure that we had cast
20 a broad enough net in the uncertainty analysis that we
21 presented in our report so that it would cover the
22 range of cost uncertainty that Knight Piesold would
23 come here to talk about. And so what we've -- what we
24 have done in our piece is the -- if the uncertainty is
25 as Knight Piesold expects it to be, what -- what does

1 that look like in terms of the quilts?

2 So I guess I'm relying on our discussion
3 with Knight Piesold to sort of define that band. We
4 can obviously do different set up. We could -- we
5 could narrow or -- or differently shifted or however
6 you want to do that. But the one we did do was -- is
7 the result of a discussion with Knight Piesold about
8 their view of the cost estimates and the uncertainty in
9 the cost estimates.

10 We wanted to make sure that when we came
11 to this day, that we would have an analysis that had
12 bracketed the kind of uncertainty in the cost that --
13 that they were -- they were prepared to testify to.

14 MR. JOHN ATHAS: And I -- I agree every
15 -- with everything Mr. Peaco said. I just want to make
16 sure that we understand. You asked a question. And I
17 don't want to try to answer it too narrowly, but you
18 answered based on what we know today, what -- you know,
19 versus what different opinions have come out today, in
20 -- in the six (6) months.

21 What we -- I just want to make sure we
22 understand the -- the use of the -- of the uncertainty
23 analysis and the like to see if it's -- you know, how
24 it applies. We know that, from Manitoba Hydro's
25 perspective, they've increased their high capital cost

1 estimates. That, on the surface, could make one assume
2 that they have changed their perspective as to what's -
3 - what might be a wide enough band to analyze.

4 They also have put -- correspondingly,
5 they've changed the -- they've reduced the probability
6 that they assign to the -- to the high capital cost
7 estimate. So it's hard to -- we haven't done any
8 analysis to assume whether that's a curve shift or
9 whether they're reading a different point off of the
10 same curve. If they're reading at a different point
11 off of the same curve, then we haven't had any updated
12 information as to the perspective on -- on overall
13 uncertainty on the -- on capital costs. We may have
14 just had their -- their one opin -- their known
15 opinion, choosing to look at different points.

16 So -- so the amount of specific
17 knowledge that I would say is known that has come out
18 in -- in -- for the ranges of information, because
19 there hasn't been any updated full, you know, thorough
20 uncertainty analysis around things since 2012 and the
21 small -- and the small 2014 updates, that some -- I --
22 I think that the -- still -- still potentially some
23 learning to do as to whether the ranges were adequate.

24 MR. ANTOINE HACAULT: Thank you for
25 that. So does it leave us in this hearing with what's

1 been happening with a lot of other -- my other
2 questioning? La Capra had looked at the original
3 filing. And if we go -- can you scroll so we can see
4 the introductory paragraph of this conclusion, Diana,
5 just a bit up.

6 Here La Capra, in its initial comments,
7 says: "Some concerns we discuss in our
8 report."

9 So one of the concerns of La Capra was
10 that it assumed very little uncertainty in the cost of
11 Conawapa and, we've been talking about Conawapa, but
12 associated transmission facilities.

13 Does that continue to be a concern, sir,
14 or are we in the same situation as a lot of other
15 subjects: we had -- La Capra's offered an opinion based
16 on the official -- initial filing, but can't offer an
17 opinion to this Board based on the new information and
18 the new probabilities and costs?

19 MR. DANIEL PEACO: I think it's
20 probably closer to the latter than the former. We --
21 we have the new cost -- capital cost updates that the
22 Company has provided. We have not had an opportunity -
23 - I know that Knight Piesold has had some opportunity
24 to look at those, but we have had -- not had an
25 opportunity to confer with them or do any analysis

1 associated with that.

2 We've -- the only thing we've been able
3 to do at -- at this point is to take Hydro's numbers
4 and do the update that we provided in the addendum.

5 MR. JOHN ATHAS: Could we have a
6 second?

7

8 (BRIEF PAUSE)

9

10 MR. JOHN ATHAS: All set. No problem.

11 MR. ANTOINE HACAULT: So does this fall
12 into the same category as the previous subjects that
13 I've covered: unless the PUB requests that information
14 be updated, at this point La Capra can't comment on
15 whether it still continues to have concerns with the
16 updated approach or not?

17

18 (BRIEF PAUSE)

19

20 MR. DANIEL PEACO: Well, the -- hang on
21 a second.

22

23 (BRIEF PAUSE)

24

25 MR. JOHN ATHAS: We -- we've updated

1 the 2012 -- our review of the 2012 analysis in the
2 addendum for the new capital cost estimates. You know,
3 that's -- that's what -- pardon me. That's what the --
4 the addendum is. And that inc -- I'm not -- I'm not
5 sure what information you are suggesting that we could
6 update for -- update for, if -- if requested by the --
7 by the panel.

8 MR. ANTOINE HACAULT: Sorry. Well, let
9 me just bring you back to Exhibit 104-8. At -- it's
10 page 3 in the PDF, but page 2 of 7 in the document. If
11 -- you see in the middle of the paragraph, it talks
12 about updated probabilities. And in the middle it
13 says:

14 "The reference capital cost scenario
15 probability weighting has been
16 updated to 60 percent from 50 percent
17 used in the NFAT submissions."

18 So you would have looked at the 50
19 percent:

20 "And the high capital cost scenario
21 probability weighting has been
22 updated to 20 percent from the 30
23 percent used in the NFAT submission."

24 So I can understand for Keeyask why we
25 might want to do that, because we have a signed

1 contract. And the reason I was asking whether La Capra
2 considered this issue and whether it still had concerns
3 is we've got Conawapa coming out in, at the earliest,
4 in about eight (8) to ten (10) years, and maybe later,
5 out in the -- in the future. But the weighting for the
6 high capital cost of Conawapa and related transmission
7 has been brought down from 30 percent to 20 percent.

8 And are we sure that this is an
9 appropriate stress testing and an appropriate
10 probability weighting and an appropriate change in
11 probability weighting?

12 MR. JOHN ATHAS: We did not incorporate
13 the -- as it says in Addendum 9A in the introduction --
14 9U in the introduction, that it -- we did not
15 incorporate new pro -- probabilities that were assigned
16 to the high and low, the high and reference. We used
17 the original ones with the -- because of the aspect
18 that they're being -- that those probabilities were
19 assigned to scenarios that had changes in capital costs
20 to all generation. And there has been some
21 information, as you point out, regarding specifically
22 Keeyask.

23 So we chose to do the analysis, the
24 update to our analysis, using the original 50 percent
25 for reference and 30 percent for high. So we have not

1 felt that the -- that there is enough information to --
2 that we would have -- we would have made the change.

3 THE CHAIRPERSON: Now, let me just ask
4 a question here, because I -- I did earlier ask the
5 question of Manitoba Hydro in relation to the capital
6 costs and in relation to the probabilities are that
7 showing up here.

8 So -- and my question was related to,
9 now knowing that your capital costs have increased, I
10 understand why the reference has changed. What I don't
11 understand is, because the trend is been toward higher
12 capital costs, why would you maintain the low at 20
13 percent? Why wouldn't you be increasing the high to 30
14 percent, lowering the low to 10 percent?

15 Namely -- and this is my thinking, and
16 let -- and tell me if I'm wrong. My thinking is the
17 trend has been toward higher capital costs than has
18 otherwise been the case. And this has been continuous
19 throughout the history of this proposal.

20 Wouldn't you assign a higher probability
21 to increased capital costs relative to what they're
22 showing there now?

23 MR. DANIEL PEACO: There's two (2)
24 issues, I think, and John alluded to that. This
25 probability distribution, as was used in Manitoba

1 Hydro's quilt analysis and in our own, is applied not
2 just to Keeyask and not just to Keeyask and Conawapa,
3 but all -- all the capital investment in -- in those
4 plans.

5 And so in doing our analysis, we had to
6 say, there's one (1) discussion to be had about how
7 does the probability distribution around the ultimate
8 cost of Keeyask look now that we know something about
9 their contract.

10 Hydro has -- has inferred some things
11 about that contract to re-estimate Conawapa. But
12 that's obviously a somewhat more uncertain proposition
13 because you don't have a physical con -- you don't have
14 a contract in place for that facility at this point,
15 and things can happen between now and that point in
16 time. And then there's all the other ones.

17 So we were: A) with short time, and B)
18 with -- with not -- not being clear that applying this
19 new distribution to everything that's treated as
20 uncertain in the capital costs domain in the
21 uncertainty analysis made sense to do that. So that's
22 -- that's a pro -- that's -- that's an issue.

23 I think it's a -- it's a fair discussion
24 to have to say: What do we know about Keeyask and how
25 it changes its distribution? And while there's --

1 there's still obviously -- I mean, my understanding is
2 the contract is by no means a fixed -- fixed-price
3 contract, so there's still opportunity for the cost to
4 move on Keeyask, it does -- it does resolve some
5 uncertainties for that facility. But it doesn't change
6 some of the others. And it -- and it does give you
7 some reason to think that the prior estimates were --
8 were -- the range was low, because what we're now
9 looking at as a reference case was -- was pretty close
10 to their high end before.

11 So -- so I think -- I understand your --
12 your question and concern, and I think we have the same
13 concern. But we don't really have the information I
14 would -- I know that Knight Piesold was -- was
15 beginning to look at this, but I don't know where they
16 are in the process of looking at that.

17 MR. JOHN ATHAS: I would point out that
18 -- that there -- there are a couple of things. There -
19 - there's this -- there's this certain -- this -- I --
20 I agree with the logic that you -- that you're putting
21 forward. One of the -- but we -- and we tried to
22 bracket that, as Mr. Peaco mentioned earlier, because -
23 - in trying to anticipate what people may think is
24 relevant ranges and -- and the like as to -- as
25 information evolves.

1 So in -- in technical Appendix 9B on
2 page 60, we -- we showed -- we did a capital cost
3 sensitivity analysis. And the capital costs that we
4 included in there, without -- with -- with the basis of
5 some discussion with Knight Piesold -- they were not
6 finished their work. With the basis for -- without a -
7 - any scientific derivation of looking at all the
8 different parts of the construction process and the
9 like.

10 We -- we cho -- chose to change the
11 capital cost estimates for Keeyask and Conawapa to
12 where we made low the reference, the prior reference,
13 and we made the reference 20 percent higher than the
14 prior reference, and we made high 20 percent prior --
15 higher than the prior high. That's certainly the --
16 there hasn't been a lot of information that's get --
17 that says that that was -- that is now the prevailing
18 opinion, but it -- it does provide information as to
19 how much, if you move the whole set of all three (3)
20 case, either by changing the low probability, or chan -
21 - changing the probability of low, or changing the --
22 the course of low.

23 We have a second sensitivity -- capital
24 cost sensitivity, where we -- we just increased the
25 probability of the -- of the high capital cost, and --

1 and not change the -- the reference. So there's --
2 there's different sensitivities that -- that could be
3 done. There's -- that we tried to bra -- bracket the
4 one (1) with the changing of the probabilities. Those
5 are very easy to do, but to simulate a change in a view
6 point.

7 But the one that sounds closer to what
8 you're -- which is it -- which you're posing as -- as a
9 -- a potential outcome is the sensitivity that starts
10 on page 60 on the section Roman numeral IV, and that
11 would -- that -- that incorporates the -- moving the
12 trend of all three (3) estimates.

13 MR. ANTOINE HACAULT: I'll -- before I
14 move on, I'll -- I'll try that again. So you've put
15 all these sensitivities. Are we to take it that this
16 is the best opinion of La Capra as to what appropriate
17 stress testing is to look at these projects and inform
18 our decision as opposed to the quilt, because the quilt
19 is not as, I'm going to say, as extreme as what you're
20 proposing as stress testing?

21 And I'm still trying to get an answer on
22 what's the highs and what's the lows? What's the
23 appropriate stress testing? We have one (1) in the
24 quilt, and we have a whole bunch of scenarios in your
25 material. Do we just put the sensitivities and the

1 material aside as not being something that's relevant
2 as far as highs and lows, or should those be the new
3 highs and lows?

4 MR. DANIEL PEACO: Well, we don't -- I
5 guess, the analysis that we did brackets the
6 information that Hydro has put on the table. It
7 bracketed the opinion that Knight Piesold had back at
8 the end of last year when we conferred with them in
9 preparing our initial report. Whether it's fair --
10 whether -- whether there's a -- a value -- a reasonable
11 value that falls outside of this boundary now is -- we
12 -- that's a piece of information we haven't pursued.
13 We haven't talked with either Hydro or Knight Piesold
14 about the updated capital cost and how that might
15 actually play out in the uncertainty for those projects
16 or for the other facilities.

17 The -- you know, to the extent that
18 there is an opinion that there is a larger bracket, you
19 know, clearly as John described, that analysis is easy
20 to set up and do in our -- in our modelling, subject to
21 the updating on other information.

22 Or I would note that higher highs,
23 particularly in the -- in the context of Conawapa,
24 we're already at the point where the project, at the
25 cost we have, is -- is not showing good economics. So

1 a higher number is -- is maybe interesting, but it's
2 just going to show, you know, a larger negative
3 economics.

4 So at some point, it becomes an economic
5 exercise, how -- how high that cost could go. Now,
6 once -- once you've committed to it, you worry about --
7 if you -- if you commit to a certain out -- investment,
8 and then after you've committed, at the end of the
9 project it's a lot higher than you estimated, that's --
10 that's a different problem. But at this point, you're
11 talking about Conawapa as a -- as an option you have
12 yet to commit to.

13 MR. ANTOINE HACAULT: So, understood.
14 So am I to take from your answer that it probably isn't
15 useful for the PUB to ask for that information, because
16 Conawapa's not -- the econo -- economics aren't there
17 with the current forecasts, and if we choose a
18 different ref being the high capital costs, which is
19 what happened in Keeyask, it would only make the
20 situation look worse, so we really don't need to go
21 down that road?

22 MR. DANIEL PEACO: Well, I -- I guess
23 we can -- I think we've done -- we've given a full
24 explanation of the analysis that we can do, but I would
25 -- I guess it would be my recommendation that before we

1 -- we take on an additional analysis of that, we're not
2 to -- I mean, the -- the specific questions of the
3 capital cost uncertainty will be -- will -- I'm sure
4 will be subject of the -- the Knight Piesold
5 presentation when they -- when they come in.

6 And at that time, if there's new
7 information that the panel would like to see in an
8 updated analysis from us, we're happy to do that. I
9 just -- I just don't have the -- the underlying base of
10 information to offer up something other than it, What
11 if it's higher? What if it's lower? I don't -- I
12 don't have the underlying knowledge and the updated
13 cost estimates and the uncertainties to offer a
14 reasonable alternative to that.

15 And, I mean, we're -- we're happy to --
16 to provide perturbations to the uncertainty analysis
17 we've done with 30 percent adders, if you -- if you
18 choose, but it was simply as a, What if it is, what's
19 it look like kind of analysis.

20 MR. JOHN ATHAS: Okay. Thank you. If
21 I could just correct something, I was actually looking
22 at some analysis that was done on high capital costs,
23 but not -- not the original thorough analysis.

24 The Technical Appendix 9A on -- on page
25 108 star -- and -- and page 114, start two (2)

1 different analyses that we did for the testing around
2 sensitivities around capital costs. So the one I was
3 speaking about on the -- starts on page 116 of -- of
4 Technical Appendix 9A.

5 MR. ANTOINE HACAULT: Thank you very
6 much, gentlemen, for your -- your assistance. Now, I
7 don't need to get into a -- a very detailed and
8 technical discussion on the next two (2) parameters.
9 We've discussed construction costs, which is one (1) of
10 the main factors, and whether or not we've got a band
11 that's wide enough.

12 Are you able to provide any comments
13 from a due diligence perspective with respect to the
14 two (2) other factors, being the -- the prices we went
15 through, Potomac, and -- and that 50/50 analysis? I
16 think we've dealt with that.

17 Is that fair enough? That would be an
18 appropriate stress test?

19 MR. DANIEL PEACO: Yes.

20 MR. ANTOINE HACAULT: Now, what about
21 the other metric that we've got left on our quilts,
22 which is the discount rates?

23 Do you have any recommendations or
24 comments on the appropriateness of the parameters that
25 Hydro's chosen as low, refs, and highs?

1 MR. JOHN ATHAS: Just -- just for a
2 couple -- backing up a step for clarity. We did a few
3 energy price or energy export revenue sensitivities,
4 and they're in -- laid out in Technical Appendix 9A,
5 some of which was updated in -- in the addendum.

6 One of the reasons why we particularly
7 tried to do the Potomac Economics test is that, as a --
8 as a charge to the -- going forward to the -- how to
9 work together, and -- and, like, for the independent
10 energy consultants team, we were asked to try to
11 incorporate as much information from the other experts
12 as possible into our -- into our analysis.

13 So that was one of the reasons why we
14 felt it was important to try to take the latest
15 information from Potomac economics and include that in
16 the price sensitivity. There are other kinds of export
17 price sensitivities in our -- in our reports, like plus
18 and minus 10 percent revenues, export revenues and the
19 like, so.

20 Now, similar -- as you asked about
21 discount rates, similarly, we had discussions with --
22 with representatives from MPA on the -- on the
23 appropriateness of the estimates for the discount
24 rates, which are really saying the appropriates -- or
25 the appropriateness for the estimation of the interest

1 rates assumptions that feed into that discount rate.

2 With the -- with -- based on those
3 discussions, we had two (2) avenues to pursue
4 developing different kinds of sensitivities. One (1)
5 is -- one (1) is very quick, because it was saying that
6 it -- it's the -- there's a de minimis probability on -
7 - on -- that came out of that discussion for the low
8 discount rate sensitivity -- outcome that was modelled
9 by Manitoba Hydro, and we have a -- an analysis in --
10 in our technical Appendix 9A that removes that branch
11 and assigns -- assigns just a 50/50 probability to the
12 other two (2) branches, the high discount rate as
13 modelled by Manitoba Hydro and the reference.

14 The other part of the discussion we had
15 with MPA was that the -- that the -- that probably --
16 that -- that the -- another way to look at it, they
17 were saying that they -- you should proba -- you might
18 want to have -- and they were not finished their
19 analysis at this time, so that -- but we had to get
20 some kind of opinion before going in, so that we said
21 that the -- they said that the low, reference, and high
22 might all be a little bit lower than they would have
23 estimated them to be.

24 So that we ran a sensitivity
25 incorporating their information in a -- in a -- a more

1 round way, to not imply over -- over-precision, we ran
2 a sensitivity to discount rates where the low is 4 1/2
3 percent, the reference was 5 1/2 percent, and the high
4 was 7 1/2 percent, and that ref -- represents roughly
5 about a, you know, a little more than a 1 percent
6 increase in low, about a 1/2 percent increase in -- in
7 the reference, and about a 1 percent increase in high.

8 THE CHAIRPERSON: Just for the
9 transcript, MPA is Morrison Park Advisors?

10 MR. JOHN ATHAS: Morrison Park
11 Advisors, yes.

12

13 CONTINUED BY MR. ANTOINE HACAULT:

14 MR. ANTOINE HACAULT: Can I attempt to
15 put this statement to you, and if you think it's fair,
16 you can respond? Can I take it that if you're running
17 scenarios in your analysis with respect to capital
18 cost, discount rates, and energy prices, that La Capra
19 believed it was a credible sensitivity which needed to
20 be run, and should be considered in arriving at a
21 decision?

22

23 (BRIEF PAUSE)

24

25 MR. JOHN ATHAS: The -- there was some

1 discussion yesterday about integrated resource planning
2 versus a -- this kind of analysis that's here. This is
3 a -- a little unique in a process for -- for doing some
4 analysis, from our perspective of the -- in support of
5 the -- the panel and the question here.

6 Normally, the choice of sensitivities
7 and even of what -- even metrics and other analysis --
8 to -- to guide the analysis comes from a discu -- from
9 our discussion with the client. You know, what --
10 what's important to them. What are they worried about
11 and the like, and the -- and the unique nature here,
12 where we are left to be independent and also to have a
13 scope of work that's in charge -- that's charged with
14 putting together lots of sensitivities and prescribed
15 to us in the scope of work, the -- the -- that
16 discussion did not take place other than through the
17 scope of work.

18 So we -- we ran -- a lot of the
19 information that we ran here was -- was, you know,
20 directed by needing to fulfill the scope of work, and -
21 - and so they -- and they -- and we tried to do that
22 within a, what we considered a relevant range of things
23 based on discussions with the other -- other experts.
24 They, you know, it take -- we, in some ways did not
25 have the luxury, and then need to take the -- develop

1 the opinion as to whether those were -- were the most
2 important sensitivities to make.

3 So since you're speaking about it in a
4 generalized way, looking at all of our sensitivities.

5 MR. ANTOINE HACAULT: And so if I
6 reformulate my suggestion to you, you've used relevant
7 range.

8 Can we take it that if there is an
9 analysis in your reports with respect to energy
10 construction costs or discount rates, that is an
11 illustration of a relevant range, which needed to be
12 run and should be considered in arriving at a decision?

13 MR. JOHN ATHAS: Again --

14 MR. DANIEL PEACO: Let me try. I think
15 I'm with you up until the -- until the end. I think,
16 as John said, our -- our charge was to develop the
17 sensitivities and do our best to put a -- put a
18 relevant range in, relevant being what we understood
19 the other experts were going to be testifying to, and
20 making sure that when -- when the -- when the panel had
21 our evidence and their evidence, they could look at our
22 analysis and say, This is what I think about Knight
23 Piesold's judgment about capital costs uncertainty, and
24 I can look up in La Capra's numbers and find how mu --
25 how sensitive the result is to that number. I can look

1 up to see how sensitive it is to Morrison Park

2 Associates's recommendations on discount rate.

3 So we endeavoured to test the parameters

4 that were identified as being -- I think -- I think, by

5 and large the parameters we tested for sensitivities

6 are -- are relevant and important to look at. And I --

7 we did our best to make to sure that the ranges that we

8 tested were relevant to the -- to our best

9 understanding of the opinions that -- that the panel

10 will hear from the other experts that are -- that will

11 be testifying to those. And -- and the panel will

12 ultimately put whatever weight they want to our

13 sensitivity analysis in those opinions --in -- in

14 picking numbers off the table.

15 Now, if -- if the -- if the universe has

16 moved so far that, that we're off the chart -- we're

17 outside the bounds of those sensitivity analysis, then

18 -- then the panel would need to decide whether we need

19 to redo some things. But that was the -- the spirit in

20 which these things were done. But I -- I think I fall

21 short of the last part of your statement.

22 MR. JOHN ATHAS: Yeah, I -- I agree

23 with that. I just wanted to also mention that if there

24 was a element of the scope of work that we thought was

25 asking us to prov -- put together numbers that we

1 considered impossible, or at least such -- so
2 improbable, we would've felt compelled to note that on
3 our -- on our slides, our tables.

4 MR. ANTOINE HACAULT: Thank you very
5 much for that discussion. That ends this part of the
6 discussion on have we chosen the appropriate stress
7 tests up and down and -- and what should we look at or
8 what -- what La Capra's views were.

9 I'll do a couple little different or
10 separate subjects and then get back into other areas.
11 In particular, Diana, could you bring the La Capra
12 presentation -- I think it's been marked as Exhibit 45
13 -- slide 59.

14 There's been some discussion between Mr.
15 Peaco and Mr. Athas and members of the panel with
16 respect to this, and especially with respect to the red
17 line, the No New Generation, as compared to some of the
18 other projects.

19 And the one thing I wanted to clarify in
20 that discussion, is it -- is my understanding correct
21 that all the, I'm going to say, other plans, if we
22 exclude the No New Generation, are based on the NFAT
23 filing?

24 MR. DANIEL PEACO: You have -- if you
25 look at the legend --

1 MR. ANTOINE HACAULT: Except for three
2 (3), I guess -- the Wind/Gas.

3 MR. DANIEL PEACO: These cases are not
4 all in this original submission; Plan 14, obviously,
5 is. If you look at the legend at the bottom, Plan 14
6 is the first one listed on the top left.

7 The next one down is called -- is
8 labelled, "Plan 16, All CCGT." That is a new case that
9 Manitoba Hydro ran through its SPLASH model, its
10 economic model, and provided to us, like, December,
11 early January.

12 MR. ANTOINE HACAULT: Can I stop you
13 just there, and then you can continue your answer?

14 With respect to Plans 14 and 16, do they
15 assume DSM? And what -- if they do, is it just a base
16 level DSM or -- or they assuming the DSM Level 2?

17 MR. DANIEL PEACO: The -- I'll -- I'll
18 answer that question for each plan. Plan 14, clearly,
19 assume -- assumes the reference level DSM from the
20 original submission; likewise, Plan 16 does.

21 The only difference between Plan 16 and
22 Plan 1, which is the All Gas, is that the generation
23 additions were all comb -- combined cycle units. And
24 there wasn't a mix of -- of combustion turbines and
25 combined cycles. Nothing else, other than that change

1 in mix of combined cycle combustion turbine, that's the
2 only change relative to Plan 1. Plan 1, clearly, had
3 reference level DSM.

4 The -- going down that -- that side of
5 the legend, Plan 3, Wind/Gas, is the Wind/Gas Plan
6 included in the submission. And again, that includes
7 the reference level DSM.

8 Moving to the right-hand side of the
9 legend, the All Gas base case is -- is Plan 1 as filed
10 in the submission, and includes reference level DSM
11 from the submission.

12 The next one down is -- we've labelled
13 as seventeen (17), No New Generation. That is the
14 second new case that Manitoba Hydro ran through its
15 SPLASH and economic models and provided the results to
16 us in -- around the end of last year. And that is
17 constructed to include a -- a mixture of increased DSM,
18 one (1) -- I -- I believe it's one (1) -- one (1) --
19 one and a half (1 1/2) times the reference level, so 50
20 percent more DSM than assumed in the -- all the other
21 cases we've talked about.

22 And it also includes a program for fuel
23 switching from electric space heat to natural gas. And
24 so there's a -- there's a combination of load
25 reductions from those two (2) sets of assumptions in

1 that plan.

2 And then the -- the last one, labelled
3 'LCA Wind/Gas', that is our variant of Plan 3, the only
4 changes being changes to the cost of the wind resource.
5 So it would -- other -- other than the change in the
6 cost of the wind resource, it has all the other
7 characteristics of Plan 3, including the original
8 reference level DSM.

9 MR. ANTOINE HACAULT: Thank you. And
10 that's what I wanted to clarify. My understanding was,
11 for doing one and a half (1 1/2) times DSM in the No
12 New Generation plus the fuel switching, that starts to
13 bring us pretty close to the definition that Manitoba
14 Hydro's given us for the Level 2 DSM.

15 And so we're not comparing plans with an
16 equal amount of DSM here; the red line is the one that
17 benefits from all the DSM, correct?

18 MR. DANIEL PEACO: That's correct.

19

20 (BRIEF PAUSE)

21

22 MR. ANTOINE HACAULT: And it also
23 benefits from the enhanced import criteria. So we
24 don't know where the other plans would be if we
25 increased the import criteria.

1 MR. DANIEL PEACO: That's right. And -
2 - and to the -- to the point -- I mean, to your point,
3 that's exactly why we asked for the plan. But for --
4 we -- we -- today we have other plans that include
5 those in other positions. But when we asked for this,
6 there was no other plan that tested any of those
7 parameters.

8 I -- I would -- I guess I -- I would
9 agree with where I think your question is going, is now
10 that we've learned that that's beneficial, to go back
11 and look and see how it -- how those elements might mix
12 in with other combinations to come up with a -- a
13 better plan.

14 MR. ANTOINE HACAULT: So thank you.
15 That's -- because I was thinking to myself, Well, can
16 we look at this graph and do a meaningful comparison?
17 And that's why I wanted to get a little bit of
18 clarification from you.

19 There's two (2) critical points that we
20 -- we -- at least two (2) anyways, that we would need
21 to address to make this comparison meaningful, is,
22 firstly, relaxing the import on all these plans, and
23 secondly, seeing what DSM would do to all these plans.

24 Would you agree with that?

25 MR. DANIEL PEACO: Yeah. I think you

1 can learn from the Plan 17 that if -- if those things
2 can be done physically and if they can be done cost
3 effectively, they clearly have a material impact on --
4 on the -- on the results of the economics.

5 MR. JOHN ATHAS: The other thing, just
6 for clarity, because you're talking about putting the
7 relaxed import into the other -- other plans, the --
8 when we had the discussion about that -- that
9 characteristic of a no generation plan with -- with the
10 members from Manitoba Hydro, that change in criteria
11 was relevant in the cases where we had 750 -- or added
12 750 megawatts of transmission.

13 So if the -- so a criteria change alone
14 may not be a good thing to look at if the -- and say
15 Plan -- Plan 2 that has no transmission additions.

16 MR. RICHARD BEL: So my understanding,
17 that -- that Plan 17 is put forward not as a real
18 alternative plan, does it stand alone? Because it
19 looks very -- on expected value it looks like it
20 dominates.

21 MR. DANIEL PEACO: Well, it does. But
22 I -- I mean, I take Mr. Hacault's point. And I've --
23 and I've seen this in other studies. If -- if it turns
24 out that DSM is -- is such a wonderful resource that it
25 improves the economics of every plan, then you should,

1 you know, include that in every plan. And I think that
2 Hydro has -- has sort of come to that realization. At
3 the time we asked for this, they hadn't gotten there
4 yet.

5 But -- so I think some of the economics
6 that are driving the value of that plan will also show
7 up and is showing up, I guess, in the -- in the new
8 information on -- on the other plans with DSM included
9 in them.

10 So I guess I would say we intended this
11 mostly as we need to see an economic test of the
12 concept to see whether it's worth exploring. And I
13 think we're now at the point where you say: Boy, that
14 did -- did a nice job on the economics. Let's follow
15 up and see how that actually best works into the -- the
16 planning overall.

17 So it -- you know, there's questions of
18 -- it sort of now begins a discussion about what's an
19 appropriate import limitation policy? Should we be
20 thinking about -- or can we be thinking about
21 transmission as -- and its import value to us? And,
22 you know, what is the proper role of DSM in any of the
23 plans that you're configure -- you're planning to
24 configure going forward?

25 So, I mean, I -- I would say those are

1 three (3) features of that analysis that might apply to
2 how you look at each of the alternatives that you're
3 considering.

4 MR. RICHARD BEL: Okay. Thank you.
5 Thank you.

6 MR. JOHN ATHAS: The one thing -- the
7 one thing I would add to that just is that the -- that
8 in -- just to -- sometimes you -- you -- plans are
9 named or given themes based on you -- you decided that
10 you wanted to test a certain amount of -- a certain
11 combination of elements that you already have and you
12 try to figure out a way to name them and to keep track
13 of them.

14 In this case, this -- the -- there is,
15 as -- as Mr. Peaco mentioned, some very important
16 learnings to take out of there relative to the -- the
17 import policy and DSM. Those were viewed as
18 instruments by us to -- to develop a case that deferred
19 generation enough to call it New Gen -- No New
20 Generation, along with fuel switching, to -- you know,
21 to meet a question that was posed to us in the scope of
22 work.

23 But -- so it's -- it's just a good
24 example that -- that plan-to-plan conclusions are one
25 thing that can be made, but there's a lot of

1 information and learning to be done from -- from
2 examining the components of the plans, as -- as we just
3 had the discussion.

4 THE CHAIRPERSON: Yeah. You might not
5 be able to -- for example, you might not be able to
6 lock in firm capacity from the US at the time you need
7 it if you go with this particular -- I mean, you could
8 -- you know, I think the danger of this is that -- I
9 understand the value of this.

10 But the danger to this is that if you
11 overweight this outcome relative to other possibility
12 or other options that have been examined.

13 MR. DANIEL PEACO: Yeah. And I -- I
14 would say to that point, to the extent that you and the
15 person that were saying, We're done, go do this plan; I
16 mean, it's -- it's not that. This was a -- this was,
17 you know, in part, directed in the scope of work:
18 What's -- consider what it looks like if we don't do
19 generation in Manitoba. And so we -- we said, Well,
20 first we've got to get a sense of what's the economics
21 look like.

22 And we -- John and I sat in a room and
23 we said, Well, how could we do that? Well, let's -- we
24 got to think about DSM. We got to think about imports.
25 We got to think about fuel switching. And so we just

1 kind of came up with -- with something to test. And
2 there was always a possibility the test would -- would
3 be far to the left here. And we'd say: Well, none of
4 that works. I guess we got to do generation.

5 But it went the other way. So now --
6 but -- so now I -- I would recommend it only to the
7 extent that it raises issues that -- that seem to have
8 promised improved economics.

9 What we've learned from this case and
10 from some of the other cases we've looked at, the
11 import dynamic, even when you're building for more
12 export, is important in the -- in the dry years. And
13 so that's -- and -- and the import limitation there is
14 -- is a consideration in the economics of -- of every
15 plan, those kind of things.

16 So I would say take the -- take the
17 lessons from that, from the DSM cases that have been
18 run, and then sort of figure out what mixture of these
19 things makes sense. And -- and in many cases, the
20 things that were featured in that hypothetical No Gen
21 Plan would need to be vetted to see how would we
22 actually do that. If we were going to build the
23 transmission solely for export, as this literally would
24 contemplate, what would be the best transmission line
25 to do that? It wouldn't necessarily be this -- the

1 same 750 line that we're -- that -- that you're
2 building for export.

3 But -- but what we -- what we did see is
4 if you do build it -- and it goes back to the
5 discussion we were having earlier -- if you do build
6 the 750 line with Keeyask and the -- and the Plan 6
7 discussion we were having earlier, it would also bring
8 with it some of that import flexibility as well, which
9 we talked about before.

10 So that part we've -- we've learned from
11 the -- from the analysis that we've done, if that -- if
12 that helps.

13 THE CHAIRPERSON: Okay.

14

15 CONTINUED BY MR. ANTOINE HACAULT:

16 MR. ANTOINE HACAULT: Just before we
17 break, just on this particular slide, 59 of Exhibit 45,
18 can we find somewhere what Hydro was asked to assume or
19 what it did assume as the cost of the DSM measures that
20 you've talked about, the one and a half (1 1/2) and the
21 fuel switching?

22 MR. JOHN ATHAS: The -- the detailed
23 information that was sent to us, along with the -- with
24 -- and transferring the information on these cases has
25 those -- has those cost assumptions in them. It's --

1 the -- you -- you can't see the cost of any one item in
2 -- in any of these lines in -- on -- on the chart.
3 Because I -- I took your question as: Can you see on
4 this chart the cost of --

5 MR. ANTOINE HACAULT: Oh, no. No, no.
6 I -- I just -- do we have in our materials -- because I
7 confess, although I've read most of them, I don't
8 necessarily retain everything of the I don't know how
9 many thousand pages.

10 Is there somewhere in the materials that
11 I can find where the DSM cost assumptions are -- just
12 like what -- when this was run, what did it cost for
13 one and a half (1 1/2) DSM and the fuel switching?

14 MR. DANIEL PEACO: We received -- we
15 received the -- the economic model output from Manitoba
16 Hydro, but we're still -- we still have not received
17 sort of the -- the backup in the assumptions.

18 MR. ANTOINE HACAULT: Are you able to
19 advise whether there was any cost assigned to DSM?

20 MR. JOHN ATHAS: Definitely there was
21 costs assigned to DSM in the -- in their analysis.

22 MR. ANTOINE HACAULT: You just don't
23 know how much. Is that it?

24 MR. JOHN ATHAS: Offhand, I -- there's
25 a column of numbers that are for -- for seventy-eight

1 (78) years for many different plans that I haven't
2 committed to memory.

3 MR. ANTOINE HACAULT: Is that something
4 that's filed in the materials, part of the record of
5 this hearing?

6 MR. JOHN ATHAS: I actually don't know
7 if it -- if it has been filed.

8 MR. ANTOINE HACAULT: With respect to
9 this particular plan, No New Generation, 17, to the
10 extent it's not CSI, because I wouldn't want that
11 disclosed, would it be possible to put that background
12 information on the record?

13 MR. JOHN ATHAS: Yes. We could extract
14 the -- the cost information from the tables that was
15 given to us by Manitoba Hydro for the twenty-seven (27)
16 scenarios -- twenty-seven (27) scenarios that was --
17 that was modelled to get the red line.

18

19 (BRIEF PAUSE)

20

21 MR. ANTOINE HACAULT: I don't know if I
22 can narrow that undertaking, but what I'm looking for
23 is -- and I think it would just be one (1) cost. I
24 mean, it shouldn't vary if it was an assumption for
25 DSM.

1 What I'd like to have, to the extent
2 it's possible to focus on -- on that particular item,
3 is with respect to the slide at page 59 of Exhibit 45,
4 I'd ask that we be provided with the DSM expenses and
5 fuel-switching costs that were assumed in running the
6 model leading to the No New Generation example on that
7 slide.

8 MR. JOHN ATHAS: Okay. There are
9 twenty-seven (27) cases that go into running -- to
10 developing that red line. There -- and I'm not -- I'm
11 not positive now that I -- that they are all the same
12 cost assumption for DSM under all those cases.

13 So, certainly, if they are the same,
14 then I only have to give you one (1) common number.
15 But if they're -- if they're different or -- or
16 partially different between cases, maybe there's -- I
17 forget whether there was a low and a high DSM cost or
18 things like that. Then I'd have more columns than one
19 (1).

20 MR. ANTOINE HACAULT: Okay. Well,
21 provide me the narrow one if you can, and if it needs
22 to be wider, you'll provide me with the wider one?

23 MR. JOHN ATHAS: Are you suggesting
24 that you'd like just reference/reference/reference?

25 MR. ANTOINE HACAULT: Whatever's

1 easier. I'm not looking to create a whole bunch of
2 work here, but I'd like to know what the DSM and fuel-
3 switching costs were. And --

4 MR. JOHN ATHAS:

5 Reference/reference/reference would certainly be
6 representative of the costs that they -- that they've--

7 MR. ANTOINE HACAULT: Well, let's --
8 let's start with that. So the undertaking would be to
9 provide the assumed DSM and fuel-switching costs at
10 reference/reference/reference. And if we believe that
11 that information isn't complete or needs to be
12 supplemented, we'll communicate further with counsel
13 for independent expert counsel -- consultants.

14 MR. CHRISTIAN MONNIN: We'll accept an
15 undertaking with two (2) -- two (2) issues. I'll couch
16 it under taking under advisement. We're not sure if we
17 can actually isolate that information and pull it out.
18 And then there's also the CSI stipulation which will
19 have conduct of that undertaking.

20

21 (BRIEF PAUSE)

22

23 MR. CHRISTIAN MONNIN: Sure.

24 MR. ANTOINE HACAULT: It might be an
25 appropriate time for a break. I'd just like to make

1 sure I reorganize my notes and -- and see what priority
2 items I should deal with because, quite frankly, the
3 discussion I had this morning on is the high high
4 enough and the low low enough and the parameters lasted
5 a lot longer than I thought it would. I thought we
6 would have some pretty short answers on that. But
7 there was a useful discussion which lasted a bit
8 longer.

9 THE CHAIRPERSON: Okay. Let's take ten
10 (10) minutes. Thank you.

11

12 --- Upon recessing at 10:30 a.m.

13 --- Upon resuming at 10:46 a.m.

14

15 THE CHAIRPERSON: I think that we're
16 ready to resume the proceedings. So if everybody is in
17 position, we will -- we will commence the hearing
18 process.

19

20 CONTINUED BY MR. ANTOINE HACAULT:

21 MR. ANTOINE HACAULT: The next subject
22 I just -- that's just going to be very short, we've had
23 the gas -- and this discussion has occurred between the
24 panel and, I believe, Mr. Peaco and perhaps Mr. Athas -
25 - has that straight line and no curve. And Dr. Grant

1 referenced that.

2 Now, I just want to clarify actually in
3 Exhibit 13, which is Appendix 10A at page 61, La Capra,
4 as I understand it, is acknowledging that, with respect
5 to the Gas Plan, there's a fair amount of uncertainty
6 because of the back-end long-term gas price risk.

7 Is that correct?

8 MR. JOHN ATHAS: Yes. We've recognized
9 that at a couple of places in this report.

10 MR. ANTOINE HACAULT: So although your
11 comparisons always start with that straight line, if we
12 drew the probabilities and risk with respect to the
13 gas, as we see that in the quilt, it shows us some
14 negative and positive aspects to that plan; but we're
15 not saying that it's not a risky plan.

16 MR. JOHN ATHAS: Yeah. I mean -- I
17 mean, risk -- risk has -- has a -- needs more
18 definition when you discuss what's risky and what --
19 what's -- whether something has risk. In the -- in the
20 cost variability after the -- after a plan is chosen,
21 there isn't a plan here that doesn't have variability
22 risk.

23 We tried to show that in -- and I think
24 we -- we answered an IR about that as well. But if --
25 if you look at 10A, page -- page 46 in 10A, you'd see

1 that we showed the variability of -- of price of
2 electricity in the year 2032 for the All Gas case
3 versus the Preferred Development Plan in that point in
4 time, in -- in that one (1) year. And that shows that
5 the -- that shows that the -- I believe it's the prior
6 page. Oh, actually, I have different page numbers, so
7 it's -- yeah, prior page, please, page 45.

8 So this is a -- this is a representation
9 using the same -- the financial model output of the
10 twenty-seven (27) branches for the All Gas Plan vers --
11 and the Plan 14, which is the one labelled 'K19 sales
12 with C25/750'. That -- that is Plan 14, and it should
13 have been labelled Plan 14.

14 But the -- so this graph shows what the
15 -- how variable the two (2) plans are across the
16 twenty-seven (27) branches, in terms of what the cost
17 to consumers would be as modelled by Manitoba Hydro in
18 2032. And it shows that the -- there is variability
19 around the All Gas price -- the price of electricity
20 for an All Gas plan was pursued, and there is more
21 variability around the price of the -- of electricity
22 to consumers under the Preferred Development Plan. And
23 in this -- and at that point in time, the Preferred
24 Development Plan is higher by the differences that you
25 see on the chart.

1 MR. ANTOINE HACAULT: Thank you. And I
2 think the las -- the other page which we started at is
3 also instructive.

4 It's -- can you explain that -- that
5 graph and what it tells us about the risk related to
6 the All Gas Plan over a fifty (50) year time period?

7 MR. JOHN ATHAS: Yes, it's -- this is
8 at the end of fifty (50) years, the same mechanics were
9 putting it together. Year 2062, and it shows that the
10 -- at that point in time the All Gas Plan is a higher-
11 priced electricity and has more variability across the
12 seven (7) -- twenty-seven (27) branches that were
13 analyzed by Manitoba Hydro.

14 MR. ANTOINE HACAULT: Thank you. And
15 the next short subject that I want to deal with is what
16 we've referred to as Plan 4, the one with the 250 line.
17 As I understand -- let me start with a little bit of
18 background. La Capra wanted -- wanted to decide
19 whether a DSM should be looked at. It took some
20 measures to ensure that the DSM that was being proposed
21 by Manitoba Hydro was a plausible DSM scenario.

22 Is that correct?

23 MR. JOHN ATHAS: The -- the amount of -
24 - the only scenario of DSM that we postulated was in
25 the Plan 17, and that was utilizing what was already

1 established by them as the one point five (1.5) times
2 the base. We had asked them also to do fuel switching,
3 which obviously manages demand, but it might not be
4 included in some people's definition of DSM, but -- so
5 -- and that was discussed and prescribed primarily by
6 us.

7 Outside of that, we have not had, within
8 our scope of work, to determine if any of the other
9 information put forth in the -- in the proceeding --
10 Level 1, 2, 3 -- have, you know, any degree of concern
11 on our part.

12 MR. ANTOINE HACAULT: Yes. So did La
13 Capra have any knowledge of the Great Northern
14 Transmission Line Project prior to undertaking its work
15 and what was being suggested for that project?

16 MR. DANIEL PEACO: Yes, it was
17 obviously featured in the -- in the submission.

18 MR. ANTOINE HACAULT: And what was La
19 Capra's understanding of the -- what was being proposed
20 for the Great Northern Transmission Line, and when did
21 it first become aware that what was being proposed was
22 a 750 megawatt, or 500 kV, line?

23 MR. DANIEL PEACO: Well, when we read
24 the -- read the submission, we understood their primary
25 proposal and the alternative -- the alternatives

1 offered to that.

2 MR. ANTOINE HACAULT: So was that the
3 submission by Minnesota Power, when you're talking you
4 -- you read the submission? Let me try and rephrase
5 that. I'm trying to determine when La Capra knew -- go
6 ahead if you need to discuss.

7

8 (BRIEF PAUSE)

9

10 MR. DANIEL PEACO: Go ahead with your
11 question.

12 MR. ANTOINE HACAULT: I'm trying to
13 determine when La Capra knew that the Great Northern
14 Transmission Line being proposed in the -- was a 750
15 megawatt line, or a 500 kV.

16 Did it learn it before the Manitoba
17 Hydro submission or after?

18 MR. DANIEL PEACO: Well, I mean, we --
19 we came into this project at the time that they filed
20 the submission, so we really weren't...

21 MR. ANTOINE HACAULT: When you say,
22 "submission," you're talking about Manitoba Hydro's
23 submission? Because there's various filings in the
24 States with respect to the --

25 MR. DANIEL PEACO: Yeah.

1 MR. ANTOINE HACAULT: -- Great Northern
2 Transmission Line in various publications that came
3 out, and I'm just wondering if you have any sense of
4 when either yourself, Mr. Peaco, or Mr. Athas, or -- we
5 haven't had a discussion to the extreme right, but knew
6 that Great Northern Transmission was a 500 kV line.

7 MR. DANIEL PEACO: We -- we really
8 hadn't -- we may have somebody that was aware of it
9 before we were engaged to -- to work on this project,
10 but fundamentally, we -- we became familiar with it as
11 we emerged into this project, reading the NFAT
12 submission and the materials in this case.

13 MR. ANTOINE HACAULT: And so you
14 believe that La Capra only became aware that the Great
15 Northern Transmission Line that was being proposed and
16 all the filings about a year ago, or perhaps a bit more
17 than that? You only became aware as a result of the
18 Manitoba Hydro submission that, in fact, it was not the
19 smaller line, the 250 megawatt line, but the larger
20 line, the 750 megawatt line?

21 MR. DANIEL PEACO: Yeah. We -- we
22 really had no -- no reason to -- to be, other than if -
23 - if we had been curious about looking at transmission
24 proposals around the country, we had no reason to be
25 involved in -- in the travel of that project prior to

1 being hired for this -- this assignment.

2 MR. ANTOINE HACAULT: So you spent some
3 time analyzing that option.

4 Now, from the economics directionally,
5 the analysis so far indicates that Plan 4 would be a
6 better plan for Manitoba ratepayers if it was still on
7 the -- still on a possibility where you could reapply
8 and get that line?

9 MR. DANIEL PEACO: You're referring to
10 the discussion we had yesterday?

11 MR. ANTOINE HACAULT: Yeah.

12 MR. DANIEL PEACO: Yes.

13 MR. ANTOINE HACAULT: Now, given that
14 it appears that Manitoba ratepayers are asked to bite
15 the bullet, so to speak, do you have any
16 recommendations on -- on what could occur as far as
17 sharing of the economic benefits and apportioning
18 benefits? We've looked at provincial benefits and
19 benefits to Manitoba Hydro.

20 Do you have any thoughts on how those
21 might be allocated, as I -- you've identified the
22 benefits, correct?

23 MR. DANIEL PEACO: I -- I guess I'm --
24 I'm not sure if I understand the context of your
25 question.

1 MR. ANTOINE HACAULT: Well -- well,
2 let's take it in little bites. The -- what we've
3 referred to, for example, as the interest guarantee
4 fee, you may have read in the transcripts, we've
5 established at one point in time, it was just .5 of a
6 percent, and it's been increased to 1 percent.

7 Has La Capra given any thought as to if
8 there's -- the Manitoba ratepayers are forced to bite
9 the bullet, whether one (1) way to alleviate the rate
10 pressure on Manitoba ratepayers would be to change the
11 amounts being charged for interest guaranteed fees.

12 MR. DANIEL PEACO: On the transmission
13 line?

14 THE CHAIRPERSON: That -- that strikes
15 me that that is beyond the scope of work that was
16 assigned to -- to these experts, so I -- I think
17 Morrison Park would be the more appropriate consultant
18 to -- to ask that question to.

19 MR. ANTOINE HACAULT: Thank you.

20

21 CONTINUED BY MR. ANTOINE HACAULT:

22 MR. ANTOINE HACAULT: I gave that as
23 just an example to -- to generate the discussion,
24 because the -- the witnesses didn't seem to kind of
25 appreciate or understand my -- my question.

1 Has La Capra, given that as an example
2 and keeping in mind the Chairperson's comments, given
3 any thought as to how Manitoba ratepayers could be
4 dealt with, given -- if it is -- if it does turn out
5 that the 250 option is no longer something that can be
6 pursued?

7 MR. DANIEL PEACO: I -- I guess I'm
8 going to have to ask a question. We're -- we're back
9 on transmission now instead of the -- the debt
10 guarantee fee, correct?

11 MR. ANTOINE HACAULT: Well, just --
12 there's one (1) plan, the Plan 4, which showed better
13 economics, correct?

14 MR. DANIEL PEACO: Yes.

15 MR. ANTOINE HACAULT: And if -- we're
16 being told that it would be pretty hard to redo the
17 application in the States and go back to a two (2) -- a
18 250 megawatt line, and that has a negative impact on
19 Manitoba ratepayers.

20 Has La Capra given any thought on -- on
21 how we might alleviate that negative impact on
22 ratepayers by taking that option off the table?

23 MR. DANIEL PEACO: Okay. I think I
24 understand now. So your hypothetical is saying that,
25 But for removing Plan 4 off the table, that would have

1 been a better -- better plan as an impact on
2 ratepayers, and we're going to something that's less
3 beneficial, and how -- you know, we -- that's not -- we
4 have -- our scope of work didn't go to -- to those
5 kinds of issues.

6 THE CHAIRPERSON: The new -- the No New
7 Gen case, notional case that you -- do you -- that
8 we've been looking at, the kind of trans -- the kind of
9 import amounts that we're talking about, rela --
10 relative to that plan could not be encompassed within a
11 250 megawatt line? Or am I wrong?

12 You probably haven't looked at that, but
13 -- or -- or did you?

14 MR. DANIEL PEACO: Well -- well, we
15 didn't look at that, and -- and again, this goes back
16 to our earlier discussion. This was a -- I mean, the
17 discussion we had with Hydro in putting this case
18 together was like, Okay, so how do we want to postulate
19 this? And I think the answer was -- well, the easiest
20 thing for us to do to model is to -- is to model the
21 transmission line we already have in the model.

22 So we said, All right. Run -- run this
23 case with the 750 line, and we didn't do multiple
24 cases, so we -- we -- for example, the question
25 yesterday is, Well, how much of the benefit is from DSM

1 and fuel switching, or, you know, what if we built --
2 so those perturbations of this case have not been run.
3 And -- and it was simply a -- a negotiation of
4 expediency with Hydro as to -- as to how to sort of do
5 a case that combines some of the elements that we're
6 interested in testing.

7

8

(BRIEF PAUSE)

9

10 CONTINUED BY MR. ANTOINE HACAULT:

11 MR. ANTOINE HACAULT: I'm going to
12 switch to another kind of discrete area, and it's
13 touching upon some of La Capra's comments on the
14 seventy-eight (78) year metric in the economic
15 analysis.

16 Diana, if you can bring up Exhibit 3-1
17 at page 9, please?

18 And some of the key issues that were
19 identified in this report, being the main report, at
20 number 2 was that the seventy-eight (78) year planning
21 horizon analysis is particularly susceptible to
22 forecast uncertainty.

23 We've had some evidence in this hearing
24 that the -- hopefully I'm summarizing this correctly,
25 the weighted dis -- depreciation for a generating

1 station, as far as a time frame, would be more around
2 sixty-seven (67) years.

3 Has La Capra looked at and made any kind
4 of conclusion apart from showing us different metrics,
5 as to white -- what might have been an appropriate
6 metric for an economic analysis?

7

8 (BRIEF PAUSE)

9

10 MR. JOHN ATHAS: Well, we thought that
11 the -- that appropriate metrics to look at -- that
12 someone might want to consider -- that's with some
13 degree of weight or not -- in their -- in their
14 decision were the metrics we put forward. That's --
15 that's how -- that's why we -- we chose them. I'm not
16 -- so, yes, we thought of what would be appropriate
17 metrics.

18 MR. ANTOINE HACAULT: Do I take -- take
19 it that given your choices only went to fifty (50)
20 years, is that La Capra's view is that the appot -- the
21 appropriate metrics would range from the twenty (20)
22 years to thirty (30) -- or to fifty (50) year range
23 that you've suggested, but not the seventy-eight (78)
24 year range?

25 MR. JOHN ATHAS: Well, no, we didn't

1 say that. We've actually said many times that they
2 complement the information of the seventy-eight (78)
3 year NPV.

4 We also -- and I wouldn't even -- I -- I
5 would be remiss if I didn't clarify that you -- that we
6 don't even believe that twenty (20) is the lowest
7 metric that you could use. We think an appropriate
8 metric of some weight is the -- as I had some
9 discussion -- and -- yesterday, I believe, or maybe --
10 maybe it was -- of the -- what's the -- what's the
11 capital cost.

12 I mean, there's some decisions in
13 drivers, whether it be utilities or -- or investments
14 that, you know, they take a posture of -- of, you know,
15 abs -- and -- absolutely, minimali -- minimizing
16 investment, or once an investment becomes this certain
17 size relative to their firm, or other things, they will
18 -- they will stop right there.

19 So I'm -- there's -- I wouldn't want
20 anybody read in the fact that the only new metrics that
21 we put out were between twenty (20) and fifty (50) for
22 the CPVs says that that's -- that's what we think shou
23 -- people should look at, because we also did put
24 together the IRRs for seventy-eight (78) years.

25 MR. ANTOINE HACAULT: Understood that

1 there's different metrics. And thank you for that
2 answer. I was trying to focus on the time frame. And
3 in particular, I had prefaced my question with respect
4 to the average service life that's used for
5 depreciation purposes of all the different components
6 of about sixty-seven (67) years.

7 And did La Capra give any thought as to
8 why it might be appropriate to go seventy-eight (78)
9 years, instead of the metric that we use for
10 depreciation on an average basis?

11 MR. JOHN ATHAS: To the extent that --
12 that we did not hear anything from other IECs that the
13 -- that it was, you know, ver -- unlikely that the
14 plant could be continuing to operate or that the --
15 that the investments that -- there would be investments
16 at some point that would have to be so substantial that
17 they would be relevant to the -- to the economic
18 analysis.

19 We hadn't heard that information, so we
20 went along with presumption that the -- that seventy-
21 eight (78) years had -- as modelled, had some validity.

22 MR. ANTOINE HACAULT: Thank you. Mr.
23 Williams dealt with this to some extent, and I don't
24 want to canvass what he already canvassed. But in one
25 (1) of the IRs that have been marked as an exhibit in

1 this proceeding -- it was a MIPUG IR of La Capra.

2 It noted that La Capra's view was that
3 planning analysis should be updated to current
4 information at the time an investment is made.

5 MR. JOHN ATHAS: So it was 6A?

6

7 (BRIEF PAUSE)

8

9 MR. ANTOINE HACAULT: Now, does that
10 continue to be the view of La Capra with respect to --

11 MR. CHRISTIAN MONNIN: I'm sorry, Mr.
12 Hacaault, the IR that you're referring to, could you --

13 MR. ANTOINE HACAULT: Maybe further
14 down.

15 MR. CHRISTIAN MONNIN: -- point the
16 witnesses to the specific language, please?

17

18 (BRIEF PAUSE)

19

20 CONTINUED BY MR. ANTOINE HACAULT:

21 MR. ANTOINE HACAULT: Could you go to
22 the next page? We've just seen page 1 of 2.

23

24 (BRIEF PAUSE)

25

1 MR. ANTOINE HACAULT: It's at the very
2 bottom. Sorry, I hadn't made a note of the line and
3 the page number in my text.

4 So I'll give the witnesses an
5 opportunity to review their response starting at line
6 16, going to -- or 13 going to line 16.

7

8 (BRIEF PAUSE)

9

10 MR. DANIEL PEACO: So you were in -- in
11 particular, your question was pertaining to the very
12 last sentence?

13 MR. ANTOINE HACAULT: Yes, and as it
14 relates to Conawapa and related transmission.

15 Does it remain La Capra's view?

16 MR. DANIEL PEACO: Yes.

17 MR. ANTOINE HACAULT: And if that
18 investment commitment only needs to be made in 2019,
19 does it continue to be La Capra's view?

20 MR. DANIEL PEACO: This is stating -- I
21 -- what I think is a fairly fundamental principle in --
22 in this thing as you -- you would make any decision
23 with the best then-current information that you can
24 when making a decision. And it, you know, it's a
25 lesson that's long been learn -- learned many times

1 over and over, is that things change in this industry,
2 and, you know, sticking with decisions once -- once you
3 know that things have changed is -- is always a -- you
4 know, is -- is a -- can lead to some -- some bad
5 outcomes.

6 MR. ANTOINE HACAULT: Thank you. Next,
7 just a very short subject. It's with respect to the 1
8 percent guarantee fee. There's been various references
9 in there with respect to whether it's included as a,
10 you know, provincial benefit or not.

11 Is my understanding correct that La
12 Capra has made the decision it has based on the advice
13 of Morrison Park?

14 MR. JOHN ATHAS: That's correct.

15 MR. ANTOINE HACAULT: It -- it's not an
16 appendant opinion that La Capra has reached itself?

17 THE CHAIRPERSON: Could you repeat the
18 question?

19 MR. JOHN ATHAS: Could you clarify the
20 -- the adjective?

21

22 CONTINUED BY MR. ANTOINE HACAULT:

23 MR. ANTOINE HACAULT: Yes. Okay, the -
24 - okay. Sorry it has to be -- I -- I didn't repeat my
25 question again, and I apologize for poorly phrasing the

1 question. It assumed that the previous question was
2 repeated again.

3 In La Capra's -- even the updated
4 report, it confirms that the treatment of the 1 percent
5 guarantee fee is not -- is seen as a straight transfer
6 and a cost to the province, but it refers to Morrison
7 Park.

8 So the first question was asked, Did you
9 get that from Morrison Park? The answer was, Yes. The
10 second part, because I've had different answers on
11 whether or not Morrison Park analyzed that issue and
12 came to its own independent conclusion on that issue.

13 MR. JOHN ATHAS: I believe that the
14 initial -- in our discussions, the initial question of
15 whether that was a compensatory or a transfer payment
16 might have come up from -- likely came up from Morrison
17 Park Associates and the advisors.

18 The -- when -- as the discussion went on
19 and it -- and it seemed like a -- an area where they
20 were -- where they were likely to come out in their --
21 their review, it -- it was -- and it seemed logical to
22 -- to us, we decided to put our provincial analysis
23 together, assuming that that was compensatory and thus
24 not a transfer payment.

25 MR. ANTOINE HACAULT: I don't think I

1 have an answer to my question yet. My question -- the
2 first question, you said, Well, Morrison Park's view
3 was that it was compensatory.

4 My question is: Did La Capra come -- do
5 its own analysis and come to an independent conclusion
6 on that issue?

7 MR. JOHN ATHAS: No, we did not.

8 THE CHAIRPERSON: And -- and besides,
9 it was beyond the scope of your work, wasn't it?

10 MR. JOHN ATHAS: And expertise.

11

12 CONTINUED BY MR. ANTOINE HACAULT:

13 MR. ANTOINE HACAULT: I -- I just
14 wanted to confirm that, because some of the materials
15 suggested, the way I was reading it, that you may have
16 come -- done an analysis and come to your own
17 independent conclusion. I just want to thank you for
18 that confirmation, sir.

19 MR. JOHN ATHAS: I apologize for the
20 ambi -- ambiguity.

21 MR. DANIEL PEACO: And it's -- falls in
22 a -- in a -- a category of a number of things we've
23 talked about today where we reached out to other
24 experts that were working on those areas to -- to be
25 informed about where their testimony is likely to go,

1 and how we should position the -- the work that we're
2 doing in conjunction with that.

3

4 (BRIEF PAUSE)

5

6 MR. ANTOINE HACAULT: I have another
7 discreet subject area, and I'm -- Mr. Chairman, members
8 of the panel, I'm -- I'm shooting to be completed
9 before or at 11:30, just to give you some idea of where
10 I'm at.

11 It relates to the financial analysis and
12 the discount rates, and in particular, Exhibit 13.
13 That's your Appendix 10A at page 20, that last line.
14 I'll give the witnesses a chance to read the last
15 paragraph.

16

17 (BRIEF PAUSE)

18

19 MR. ANTOINE HACAULT: Now, the
20 calculations used for the financial analysis assume a
21 seven point zero-five (7.05) nominal discount rate,
22 correct?

23 MR. JOHN ATHAS: That's correct.

24 MR. ANTOINE HACAULT: And does La Capra
25 agree that the net present value of what customers pay

1 should somehow reflect the time value of money to
2 customers?

3 MR. JOHN ATHAS: Yes.

4 MR. ANTOINE HACAULT: And to show the
5 difference that some customers might have in their
6 views as to the value of money, is it fair to suggest -
7 - and if we can go to page 22, that -- as you can see
8 below the chart, that La Capra chose a range of rates
9 going down from 4.4 percent to 9.7 percent nominal
10 discount rates?

11 MR. JOHN ATHAS: Yeah. As it says, we
12 used the low and high discount rates that were in the
13 Manitoba Hydro analysis.

14 MR. ANTOINE HACAULT: Okay. So that
15 wasn't something that was La Capra's idea in choosing
16 those particular rates. It was sourced from Manitoba
17 Hydro?

18 MR. JOHN ATHAS: That's correct.

19 MR. ANTOINE HACAULT: And your view and
20 opinion is that the seven point zero-five (7.05)
21 nominal rate is the appropriate one?

22 MR. JOHN ATHAS: It -- it certainly
23 fits with a lot of convention in -- in utility analysis
24 that the -- that the cost of money of -- of the utility
25 for doing revenue requirements analysis or analysis,

1 from the customer perspective, is -- is in the middle
2 of the debate in terms of the ranges that are debated,
3 of whether they should be extremely low or extremely
4 high from a customer's perspective.

5

6 (BRIEF PAUSE)

7

8 MR. ANTOINE HACAULT: This last area is
9 just to try and see if I can summarize some of the
10 conclusions or opinions -- I don't know how you want to
11 call them -- that La Capra put forth in some of its
12 reports, and if we could turn to Exhibit 3-2, which is
13 the February report, at page 7 -- I -- I hope my
14 colleague, Mr. Williams, is feeling better, because I
15 think I'm getting into chicken soup.

16 So the third bullet down:

17 "Supplemental analysis confirms our
18 initial assessment that Manitoba
19 Hydro evaluated a narrow selection of
20 development plans, and in most cases,
21 did not perform sufficient analysis
22 to show that the plans were developed
23 to be optimal or near optimal
24 configurations of the development
25 scenarios evaluated."

1 Does that continue to be La Capra's
2 opinion today?

3 MR. DANIEL PEACO: Yes. And it's --
4 you know, the examples or the discussions we've had
5 about the wind case, the -- the natural gas case, the
6 absence of DSM, the number of things that we've talked
7 about that are sort of missing from some of the
8 scenarios that were -- alternative scenarios that --
9 that are considered.

10 MR. ANTOINE HACAULT: So would you
11 agree with me that this puts a lot of pressure on
12 decision makers?

13 MR. CHRISTIAN MONNIN: I -- I think
14 that's ultimately the decision of the decision makers
15 to the ultimate issue, and that's the panel's
16 determination to make.

17

18 CONTINUED BY MR. ANTOINE HACAULT:

19 MR. ANTOINE HACAULT: The next bullet:
20 "The selection of alternative
21 development plans limits the ability
22 to test important alternative
23 configurations, including a five (5)
24 to ten (10) year delay of Keeyask,
25 the sequencing of transmission

1 additions, and the value of
2 transmission in non-hydro plans and
3 alternative combinations of decide --
4 demand-side management and natural
5 gas-fired generation."

6 Does that conclusion still stand today,
7 sir?

8 MR. DANIEL PEACO: Yes.

9 MR. ANTOINE HACAULT: And with respect
10 to these two (2) points, are these chicken soup issues,
11 or are they fundamental issues?

12 MR. CHRISTIAN MONNIN: I -- I believe
13 the vernacular yesterday was material or -- or
14 immaterial. I don't think chicken soup is really in
15 play here.

16 MR. ANTOINE HACAULT: Shot taken.

17

18 CONTINUED BY MR. ANTOINE HACAULT:

19 MR. ANTOINE HACAULT: Is the answer
20 material or immaterial?

21 MR. DANIEL PEACO: Pop quiz -- pop
22 quiz, if he -- he remembers other terminology. The --
23 I -- I think the discussion we've had here in the last
24 two (2) days shows where we think there are significant
25 changes in the analysis that result from the issues

1 that we're raising in these two (2) bullets.

2 MR. ANTOINE HACAULT: And can you go as
3 far as saying whether you view that these are material
4 or non-material?

5 MR. DANIEL PEACO: I think you -- the
6 panel has our analysis, and ultimately, it's their
7 judgment as to decide what's -- what's material to
8 their decision.

9 MR. ANTOINE HACAULT: Okay.

10 MR. DANIEL PEACO: They obviously --
11 they're -- they're more than rounding error in the
12 numbers, for sure.

13 MR. ANTOINE HACAULT: But, like me,
14 you're pay -- you're being paid some dollars to
15 exercise your professional judgment.

16 MR. DANIEL PEACO: We wouldn't -- we
17 wouldn't have flagged them in the summary if we didn't
18 think that they were significant issues that the panel
19 would want to consider.

20 MR. ANTOINE HACAULT: Thank you. Can
21 we go to Exhibit 3-1? And I'll be flipping, but page
22 7. The -- there's comments with respect to the SPLASH
23 economic modelling and uncertainty analysis, and --

24 MR. DANIEL PEACO: Excuse me. Just a -
25 - what document are we in?

1 MR. ANTOINE HACAULT: We're -- this is
2 the -- the January report, January 24 report.

3 MR. DANIEL PEACO: Oh. This is the
4 main report. Okay.

5 MR. ANTOINE HACAULT: The main report,
6 but -- so --

7 THE CHAIRPERSON: Just wondering. That
8 -- that isn't -- because it's showing no -- no
9 redactions, it's not CSI.

10 MR. ANTOINE HACAULT: Yeah. I just saw
11 that.

12 THE CHAIRPERSON: It's not CSI?

13 MR. ANTOINE HACAULT: It -- it -- this
14 is from the -- the public site, so we should --

15 THE CHAIRPERSON: Yeah.

16 MR. ANTOINE HACAULT: -- get one. I
17 don't think this paragraph has CSI, but we should just
18 check before we -- we proceed further.

19 MS. ODETTE FERNANDES: There were no
20 redactions made to this report.

21 MR. ANTOINE HACAULT: Okay.

22

23 CONTINUED BY MR. ANTOINE HACAULT:

24 MR. ANTOINE HACAULT: Now, the second
25 paragraph, second line, it's in -- noted:

1 "While this
2 SPLASH model], being able to simulate
3 unique characteristics of Manitoba
4 Hydro's power system has the
5 advantage of being tailored to that
6 system, it has the disadvantage of
7 limited transparency to the outside
8 reviewer."

9 Were you -- and when I say, "you," La
10 Capra -- able to conduct any kind of analysis to test
11 the soundness of that system compared to other systems
12 that you've seen?

13 MR. DANIEL PEACO: It would -- the --
14 you know, there's -- there's other -- other types of
15 assignments that we've done that would be similar to
16 this. If the utility is using a, I would say a
17 commercially standard planning model, it's easy enough
18 to licence the software and test the data and do
19 things. That's -- you know, that's not really feasible
20 in this context.

21 The -- and so we -- in -- in not being
22 able to sort of make a version of the model and do our
23 own analysis and tests, or -- and replicate their
24 analysis and test alternatives, we did have Hydro run a
25 couple of alternative cases, which we've talked about,

1 and we -- they did agree to prepare a special detailed
2 output report for us, some of which is shown in some of
3 the exhibits here, so that we could look at -- in -- in
4 some more granularity than the average results that --
5 that typically report up in the model.

6 So we could look at how the -- how the -
7 - some of the output in detail, for, say, a particular
8 water con -- configuration, and -- and tested those.
9 So we -- we did a lot with their output results, both
10 as it shows up in the economic model, and -- and the
11 production results that -- that show up in, for
12 example, the -- the analysis that we've shown on
13 results across different water year assumptions.

14 So I would say that we -- with that more
15 detailed data, we were able to do a fair amount of
16 inspection of the output, and -- and in some detail,
17 and in doing that, we -- we didn't come across anything
18 that, to us, looked like it was not performing as it
19 was antici -- it was set out to do.

20 I think the -- the work that we had to -
21 - that we did with that data overcame some of the --
22 the -- sort of the more straightforward transparency
23 methods that I talked about.

24 So we did have a fair amount of look at
25 -- at the details of their output, and spent some time

1 talking with the folks there. So I feel like we -- we
2 accomplished a lot in -- in that respect, but it --
3 obviously, it's -- it's a lot less efficient than
4 having a -- taking their data, putting it in the model
5 we have, and -- and running it and testing it
6 ourselves.

7 MR. ANTOINE HACAULT: So is it fair to
8 say that La Capra did not identify any specific
9 concerns? At least I didn't see any in the reports
10 with respect to the SPLASH model, that might show that
11 it's not reliable?

12 MR. DANIEL PEACO: We -- actually, we -
13 - we discussed this in some detail in, I think it's 6,
14 is it? Technical Appendix 6. The -- like any model,
15 there are approximations to the real world, and we talk
16 about some of those in -- in Technical Appendix 6. We
17 didn't find any that -- for the purposes of a long-term
18 planning study, we didn't find any issues that we felt
19 made it unreasonable to use for the -- for the purposes
20 of this analysis.

21 MR. ANTOINE HACAULT: Thank you.
22 That's what I was looking to -- to find out. It's
23 11:30. I -- there's some other questions I might have
24 asked, but I think I've covered most of the essential
25 stuff, and I thank both the members of the Board and

1 members of the La Capra panel for doing their best to
2 answer my questions, which weren't always clear. Thank
3 you very much.

4 THE CHAIRPERSON: Thank you, Me.
5 Hacault. I believe that we're ready to turn over the
6 microphone to Manitoba Hydro. I'm sorry? I'll canvass
7 the Intervenors to make sure there's no questions.

8 Mr. Orle, please.

9 MR. GEORGE ORLE: Thank you, Mr. Chair.
10 I do have a few short questions I'd like to ask.

11

12 CROSS-EXAMINATION BY MR. GEORGE ORLE:

13 MR. GEORGE ORLE: So, good morning, Mr.
14 Peaco, Mr. Athas, Ms. Neal. My name is George Orle. I
15 represent an organization of Northern Aboriginal
16 members, and my questions relate primarily to the area
17 of rates. And I note from the supplemental report that
18 was filed in February that you referred back to
19 Appendices 9A and 10A, and that they were still
20 appropriate at that time.

21 Given that we've had some substantial
22 changes made to the supplemental 9A that came before
23 this -- this hearing, my question is, to what extent
24 can we still rely upon 10A as being accurate or -- or
25 being appropriate forecasts for rates?

1 MR. JOHN ATHAS: Our -- my -- our
2 understanding is that ten (10) -- that all the
3 financial analysis produced by Manitoba Hydro, which we
4 used as a basis for 10A, I -- I don't think I would
5 actually -- I don't think people are constituting that
6 as a forecast of rates, because I've heard often that
7 it's -- that it's illus -- illustrations of rate paths
8 for metrics -- for comparative metrics, and not
9 necessarily a rate plan.

10 So it's -- it's not a -- so that -- I
11 just -- I'm not trying to be picky on the choice of
12 words, but I just want to make sure that I don't answer
13 something that has an implication to other people.

14 So from the standpoint of the metrics
15 and other kinds of analysis, including average price
16 for -- of electricity in -- analyzed in 10A, naturally,
17 for some plans, the -- the numbers have changed with
18 the updated capital cost information.

19 Depending on the observations and
20 conclusions that would be -- that one was making on
21 10A, I would -- I think they could -- they have --
22 still have a lot of relevance.

23 MR. GEORGE ORLE: I'm -- I'm sorry?

24 MR. JOHN ATHAS: They still have a lot
25 of relevance.

1 MR. GEORGE ORLE: And then if -- if we
2 can go to Appendix 10A, which is Exhibit La Capra 13,
3 and to page 24 in the report? And the last sentence in
4 the summary, I just wanted to get some clarification on
5 that. It reads:

6 "Moreover -- moreover, the actual
7 rates paid by domestic customers vary
8 over time, with significant increases
9 forecasted toward the end of the
10 study period."

11 I -- I just wanted to reconcile that
12 with the fact that the -- the way the rates are being
13 proposed is a annual increase that's given over a
14 period of time, and I'm just trying to reconcile that
15 with -- with your forecast, that the -- the rates will
16 vary, and that there'll be significant increases
17 towards the end of the study period.

18 MR. JOHN ATHAS: They will vary amongst
19 plans, but all plans would probably -- could be
20 categorized as significant -- having significant
21 increases over the study period.

22 MR. GEORGE ORLE: Okay. And when you
23 say, "Particularly towards the end of the study
24 period," what -- what period of time are you referring
25 to?

1 MR. JOHN ATHAS: The financial
2 analysis, and -- which include the rate analysis, went
3 out for fifty (50) years, and that's -- they would be
4 in the forty (40) to fifty (50) year range that we're
5 talking about, the end of the study period.

6 MR. GEORGE ORLE: Okay. That summary
7 was carried over into the -- the initial report, and
8 that's the reference to Exhibit 3 -- 3-1, and if we
9 could go to page 32 of that report, and the last bullet
10 on that page?

11 That bullet reads:

12 "The -- the results from LCA's
13 economic analysis indicate that the
14 PDP does not have the cost advantage
15 over some other plans that Manitoba
16 Hydro asserts, meaning the rate
17 impact issues will be more difficult
18 than Manitoba Hydro has described."

19 First of all, what -- what do you mean
20 by, "the rate impact will be more difficult"?

21 MR. JOHN ATHAS: It would be higher.

22 MR. GEORGE ORLE: Thank you, Mr.
23 Chairman. Thank you, members of the panel.

24 THE CHAIRPERSON: I'm not sure I
25 understood the -- your answer to the first question

1 that Mr. Orle posed, namely that the rates would be
2 higher at the end of the study period relative to --
3 you didn't say, "relative." But my understanding was
4 the same as Mr. Orle's, that the -- the plans call for
5 a significant increase over twenty (20) years, and then
6 we would see a dip in -- in rates beyond the twenty
7 (20) year study period.

8 So I'm trying to reconcile those two
9 (2), your statement in the report and what I just said.

10 MR. JOHN ATHAS: I think that they --
11 they go down, but they still are substantial. They
12 still are higher. They're -- they're not -- they're
13 substantially higher in the future than they are today.

14 THE CHAIRPERSON: Yeah. Thank you.

15

16 (BRIEF PAUSE)

17

18 THE CHAIRPERSON: Ms. Saunders, have
19 you got ques -- questions for these witnesses?

20 MS. JESSICA SAUNDERS: I do have a -- a
21 few short questions. Jessica Saunders. I represent
22 the Manitoba Metis Federation.

23

24 CROSS-EXAMINATION BY MS. JESSICA SAUNDERS:

25 MS. JESSICA SAUNDERS: I would like to

1 start by asking a few questions on Plan 17,
2 particularly the import capability aspect of this plan.
3 So Plan 17 includes a new 750 megawatt transmission
4 line.

5 And that's for importing firm power, but
6 no new generation in Manitoba until at least 2029,
7 correct?

8 MR. DANIEL PEACO: The -- the last part
9 of that?

10 MS. JESSICA SAUNDERS: That the -- the
11 line is for importing firm power, but no new generation
12 in Manitoba until at least 2029.

13 Is that correct?

14 MR. DANIEL PEACO: Well, actually, it's
15 later than that. The 2029 is when the transmission
16 line is -- is first introduced in that plan. I think
17 the first generation is -- is several -- several years
18 after that.

19 MS. JESSICA SAUNDERS: Okay. Thank
20 you. Would you agree that Manitoba Hydro has
21 expressed concern that there would not be enough
22 installed capacity in the US to provide a source of
23 sufficient capacity or cost-effective generation for
24 the needed level of imports?

25 MR. DANIEL PEACO: Yes, I understand

1 that.

2 MS. JESSICA SAUNDERS: And Manitoba
3 Hydro is a winter-peaking system, correct?

4 MR. DANIEL PEACO: Yes.

5 MS. JESSICA SAUNDERS: MISO, as well as
6 other relevant regional transmission organizations, PJM
7 and SPP -- that's Southwest Power Pool -- those are
8 summer-peaking systems, correct?

9 MR. DANIEL PEACO: Yes.

10 MS. JESSICA SAUNDERS: So in the winter
11 season, when Manitoba Hydro most needs firm power,
12 isn't there likely to be excess firm generating
13 capacity in MISO, PJM, and SPP?

14 MR. DANIEL PEACO: There's considerable
15 seasonal diversity, what I call seasonal diversity,
16 between Manitoba Hydro and the -- and the systems to
17 the south, yes.

18 MS. JESSICA SAUNDERS: And wouldn't
19 owners of generation in MISO, PJM, and SPP be able to
20 sell firm system capacity during the Manitoba Hydro
21 winter-peak system?

22 MR. DANIEL PEACO: The -- given that
23 they will necessarily be planning their systems to
24 cover their summer peak, it would -- they presumably
25 always have some surplus in other times of the year.

1 And so that would be an opportunity -- you know, that
2 would create the opportunity for such transactions,
3 yes.

4 MS. JESSICA SAUNDERS: And during
5 winter periods, isn't the cost of energy available for
6 export from MISO, PJM, and SPP lower in most hours than
7 it is in comparable hours of summer periods?

8 MR. DANIEL PEACO: That's the case
9 today, yes.

10 MS. JESSICA SAUNDERS: Yes. Isn't it
11 probable then that Manitoba Hydro can obtain firm
12 capacity and reasonably priced energy from existing
13 generating sources in MISO, PJM, and SPP to meet its
14 loads during Manitoba Hydro's winter peak season,
15 assuming that there is transmission capa -- capaci --
16 capability linking Manitoba Hydro with those RTOs?

17 MR. DANIEL PEACO: I'm -- I'm sorry to
18 do this, but I -- could you repeat -- I know you're
19 reading it, so could you read that again?

20 MS. JESSICA SAUNDERS: I apologize.
21 I'll engage here.

22 MR. DANIEL PEACO: Sorry. I'm a fast
23 talker, too. I've been chastised many times this week
24 already, so --

25 MS. JESSICA SAUNDERS: And isn't it

1 probable that Manitoba Hydro could obtain that firm
2 capacity and reasonably priced energy from existing
3 generating resources in those RTOs and meet its loads
4 during Manitoba Hydro's winter peak season, assuming
5 that there's transmission capacity that would link
6 Manitoba Hydro to those RTOs?

7 MR. DANIEL PEACO: Well, I think that
8 that would be something that clearly would need to be -
9 - that would be the opportunity that you would explore
10 if you were going to pursue a strategy of -- of the --
11 of the type that's embedded in that -- in that
12 scenario, yes.

13 MS. JESSICA SAUNDERS: I'll move on.
14 I'll refer you to Figure 326 at page 25 of Appendix 3B.
15 And that's at La Capra's Exhibit 6-1. Sorry, page --
16 page 25, Appendix 3B of Exhibit 6-1, La Capra exhibit,
17 if that's okay, Diana? Yes.

18 So do I understand this figure correctly
19 that the associated -- sorry, let me rephrase this.

20 Do I understand this correctly in that
21 adding a 750 megawatt line between Manitoba Hydro and
22 MISO, along with Manitoba Hydro's purchasing firm power
23 from generators in MISO, SPP, and/or PJM, would enable
24 Manitoba Hydro to export power in the annual amounts
25 shown above the dotted line?

1 MR. DANIEL PEACO: Excuse me just a
2 second.

3

4 (BRIEF PAUSE)

5

6 MR. DANIEL PEACO: Excuse me a second.
7 This -- we have a version of this that was redacted. I
8 just want to make sure that we don't get into CSI. I
9 just... Okay.

10

11 (BRIEF PAUSE)

12

13 MS. JESSICA SAUNDERS: Okay.

14 MR. DANIEL PEACO: Okay. I'm -- I'm
15 set now. I'm -- and I'm sorry, can you ask the
16 question again?

17 MS. JESSICA SAUNDERS: So I'm -- I'm
18 just trying to understand this line, and it -- it
19 somewhat relates to the questions I -- I just asked
20 you.

21 But -- so this figure, above that line,
22 adding a 750 megawatt line between, say, Manitoba Hydro
23 and MISO, along with Manitoba Hydro's purchasing firm
24 power from generators, and MISO, SPP, and PJM, would
25 that enable Manitoba Hydro to export power in the

1 annual amounts shown above the dotted line here in
2 Figure 3-26?

3

4 (BRIEF PAUSE)

5

6 MR. DANIEL PEACO: I -- I guess I can't
7 -- I can't glean directly from the table. My
8 understanding, it would be the case. The 750 line
9 would come in, in 2029, in this example. All right.
10 So it would -- it would not enable exports prior to
11 that date. There's -- there's existing export transfer
12 capability, and that's -- those are basically resources
13 that exist in Hydro today, prior to 2029, in this
14 configuration.

15 MS. JESSICA SAUNDERS: Okay.

16

17 (BRIEF PAUSE)

18

19 MS. JESSICA SAUNDERS: And so if I can
20 just refer you to the final paragraph on this page.
21 Starting at -- in the middle there:

22 "More important capacity could allow
23 higher imports in off-peak periods,
24 allowing exports of hydro during peak
25 price periods. The value of these

1 exports and of the additional
2 capacity in this scenario is likely
3 to be significant but at this point
4 is unknown, as that analysis has not
5 been conducted by Manitoba Hydro."

6 So am I correct in understanding that
7 this indicates that much of the exportable energy is
8 the result of energy imported in off-peak hours and
9 stored as elevated water in Manitoba reservoirs until
10 needed as a source of firm capacity and energy for
11 exports?

12 MR. DANIEL PEACO: Yeah, the -- I mean,
13 Hydro's system, it allows it to take advantage of off-
14 peak -- low off-peak prices and -- and store and
15 reshape that and -- and provide exports during time of
16 -- of peaks in the -- in the neighbouring systems. And
17 so that's what it's referring to.

18 MS. JESSICA SAUNDERS: Thank you. And
19 so moving on to a different area. Yesterday, Mr. Gange
20 asked you some questions regarding wind, and Mr.
21 Williams asked you some questions on solar. I'm going
22 to ask you some questions regarding these resources.
23 And I'll first go through a few sections of your report
24 to begin. And then I'll ask you some questions on the
25 potential role of those resources.

1 And as I believe they -- they somewhat
2 speak to a theme that I want to get at with you, I'll -
3 - I'll take you through the exercise of referring you
4 to a number of -- of parts of your report first, if
5 that's okay. And then I'll commence with my
6 questioning.

7 MR. DANIEL PEACO: Okay.

8 MS. JESSICA SAUNDERS: Thanks. So --
9 and this relates to Plan 17. And often in the last few
10 days we've -- we've discussed it. And this plan, of
11 course, includes DSM, fuel switching, and imports.

12 And you note that DSM and fuel switching
13 could lessen the need for new generation for longer
14 than -- than a decade, as we just discussed, correct?

15 MR. DANIEL PEACO: Yes.

16 MS. JESSICA SAUNDERS: And at page 26
17 of Appendix 3B of La Capra 6-1, in the second paragraph
18 you find that:

19 "The results of this alternative plan
20 demonstrate that even with only
21 moderate adjustments to assumptions
22 on load, the need for new resources
23 can be delayed until at least 2029."

24 And that's pretty much what we just
25 summed up in -- in my last question. And then on page

1 21 of Appendix 3A, which is La Capra Exhibit 6 -- 21 --
2 in the middle of the third paragraph, you discuss the
3 two (2) development plans that contain wind and note
4 that:

5 "Manitoba Hydro is not planning to
6 develop any wind resources. With a
7 strong domestic resource, modular
8 development options, and declining
9 resource costs, it is very likely
10 that at least some wind development
11 should be included in an optimized
12 development strategy."

13 Correct?

14 MR. DANIEL PEACO: Yes.

15 MS. JESSICA SAUNDERS: And if I could
16 ask Diana to go to Manitoba Hydro's IR of La Capra
17 number 20. When asked about which technologies La
18 Capra would have screened in that Manitoba Hydro did
19 not, La Capra indicated that they would have screened
20 in solar and biomass, correct?

21 MR. DANIEL PEACO: Yes.

22 MS. JESSICA SAUNDERS: We're nearing
23 the end. Finally, at page 31 of Appendix 3B, that's La
24 Capra Exhibit 6-1, in the last paragraph, you discuss
25 that your initial evaluation of the Wind/Gas Plan

1 identified several potential changes that could have
2 developed more optimal configuration than the one
3 presented by Manitoba Hydro.

4 La Capra noted that:

5 "Potential revisions included choice
6 of gas technology for capacity,
7 timing, and sequence of the wind and
8 gas development in consideration of
9 annual -- [sorry] additional import
10 capacity. These changes could easily
11 produce results closer to an optimal
12 solution involving wind development."

13 And that's correct?

14 MR. DANIEL PEACO: Yes.

15 MS. JESSICA SAUNDERS: And so moving on
16 to my questions. Thank you for -- for engaging in that
17 with me.

18 Recognizing that Plan 17 includes no new
19 generation, in your view, how could wind, solar, and
20 biomass play a role in further extending the date
21 before which large-scale gas or hydro generation is
22 required?

23 MR. DANIEL PEACO: Well, I think that
24 if you -- if you take the -- the Plan 17 analysis that
25 we've talked about as an illustration of an alternative

1 configuration, I think that, you know, some of the
2 lessons you could learn from that could apply to other
3 combinations of small or module resources.

4 For example, the energy savings -- or
5 some of the energy production from -- from renewables
6 might contribute in -- in a way that is manageable
7 within the hydro system as -- as part of a scenario
8 that would be an alternative configuration to what was
9 postulated in that case.

10

11 (BRIEF PAUSE)

12

13 MS. JESSICA SAUNDERS: Okay.

14

15 (BRIEF PAUSE)

16

17 MS. JESSICA SAUNDERS: And is it fair
18 to say that the imported electricity that composes Part
19 17 -- or, sorry, part of Plan 17, that could consist of
20 a combination of wind and gas from MISO?

21 MR. DANIEL PEACO: I'm sorry, try that
22 again?

23 MS. JESSICA SAUNDERS: So the imported
24 electricity that composes part of Plan 17, that could
25 consist of a combination of wind and gas from MISO,

1 correct?

2 MR. DANIEL PEACO: It could, yeah.

3 MS. JESSICA SAUNDERS: In your view,
4 what circumstances would need to be in place in which
5 the wind portion of those imports would be better
6 sourced from facilities located in Manitoba?

7 MR. DANIEL PEACO: Well, I mean,
8 there's a number -- number of combinations of things
9 that you could do. A -- the question is, the -- the
10 import line could be used for a number of purposes. It
11 could be used specifically, for example, if -- if the
12 decision -- if you have the transmission import
13 capability decision -- would be -- could be to contract
14 with a US wind resource directly, if that's -- if
15 that's where you're going, as opposed to a Manitoba
16 resource, but either of those could -- could occur.

17 But without import, transmission
18 capability to support that, then, obviously, you know,
19 any wind resource development would be -- would be
20 local, but I -- I don't know that they're necessarily
21 one or the other, and any -- on the import line may be
22 -- could be -- simply be used as -- as supplemental
23 energy or support between the two (2) systems. I -- I
24 don't know if that helps answer your question.

25 MS. JESSICA SAUNDERS: M-hm. Thank

1 you.

2

3 (BRIEF PAUSE)

4

5 MS. JESSICA SAUNDERS: In these
6 proceedings, we've heard that Manitoba Hydro is going
7 to continue to consider it's options in moving forward.

8 In your review -- sorry, in your view,
9 what economic benefits could there be to a process that
10 proceeds initially with Plan 17, and then
11 reinvestigates the potential for large Hydro
12 development, say, every five (5) years or so?

13 MR. DANIEL PEACO: Well, I -- I think
14 the -- I think it's -- essentially, what Hydro has --
15 has proposed with their proposal to sort of begin with
16 the Level 2 DSM, and to my understanding, it's -- it's
17 somewhat of a different a program than -- than we
18 assumed in Plan 17, but it has about the same effect of
19 -- if I'm adding a -- a fair amount of load management
20 into the system on a front end, and how that effects
21 subsequent decisions on timing of other resources will
22 be -- is to determined, but I -- I think, it's
23 essentially the -- the approach that they've now
24 recently proposed.

25 MS. JESSICA SAUNDERS: Okay. And of

1 course, that's an approach -- this -- this concept of
2 reevaluating every, say, five (5) years or so is -- is
3 consistent with other jurisdictions you're aware of
4 that would engage in a certain planning process
5 regarding large hydro?

6 MR. DANIEL PEACO: Well, I think that -
7 - I think Hydro is like any other utility. They've
8 continually sort of reviewing and updating their plans,
9 and looking -- looking ahead.

10 I think, when you're -- when you're
11 dealing particularly with a potentially really large
12 addition to your system, like Keeyask or Conawapa would
13 be, then, you know, the lead times in the -- in the
14 planning process is a -- is a bit more unique than it
15 would be if you're not looking at something at that
16 magnitude.

17 But I think that's -- you know, my -- my
18 sense is that's -- that's the planning -- is a planning
19 cycle that -- that Manitoba Hydro goes through, and --
20 and all utilities do that on a periodic basis.

21 MS. JESSICA SAUNDERS: Okay. Thank
22 you. Those are all my questions.

23 THE CHAIRPERSON: Thank you. It's
24 probably an appropriate time to -- to break for lunch.
25 Me. Monnin...?

1 MR. CHRISTIAN MONNIN: Yes, M. -- M.
2 President. I do have some further documents to -- to
3 file with -- with the Board. I've just received
4 confirmation as we have an errata sheet which covers
5 some of the -- the reports filed by LCA. It's just
6 been sanctioned for CSI, so we can file it.

7 I only have two (2) copies which I can
8 give to the Board at this point in time, and we'll get
9 hard copies to the balance of the parties as soon as we
10 can.

11 Mr. Secretary, that would LCA-48, if I
12 recall correctly.

13 MR. KURT SIMONSEN: That's correct.

14 MR. CHRISTIAN MONNIN: Thank you.

15

16 --- EXHIBIT NO. LCA-48: Errata sheet

17

18 THE CHAIRPERSON: Thank you, Me.
19 Monnin. So we'll pro -- we should break for -- for
20 lunch. Let's take forty-five (45) minutes, which would
21 take us to twenty (20) to 1:00. It's our intention to
22 adjourn for the day no later than five o'clock today,
23 so I'll put everybody on notice that there's a time
24 constraint. Thank you.

25

1 (PANEL RETIRES)

2

3 --- Upon recessing at 11:55 a.m.

4 --- Upon resuming at 12:45 p.m.

5

6 THE CHAIRPERSON: Good afternoon. I
7 believe that everybody's in position to commence the
8 proceeding this afternoon. So I'd like to welcome Mr.
9 Peter Kulchyski, who is going to be making a
10 presentation to the panel. So without further ado, Mr.
11 Kulchyski, if you don't mind telling us if you're
12 acting on your own behalf or on behalf of another
13 party, I would appreciate it.

14 So welcome to the proceedings of today.

15

16 PRESENTATION BY DR. PETER KULCHYSKI:

17 DR. PETER KULCHYSKI: So thanks very
18 much for having me here. And I should I am acting on
19 my own behalf, just as a member of the public. I
20 haven't had time to sort of clear this presentation or
21 vet it with my colleagues in the Quewetin Public
22 Interest Research Group (phonetic). They are very
23 interested in this whole process, but as things
24 transpired, I've been fairly busy and -- and wrote my
25 report. And I appreciate you're receiving it so late.

1 And I appreciate you're giving me a little bit of time
2 to speak before you.

3 So to cut to the meat of the matter,
4 since I have only fifteen (15) minutes, I want to say
5 I'm -- I'm concerned to bring really two (2) broad
6 issues to your attention. One has to do with what we
7 could call contingent liabilities, significant
8 financial costs that could arise from unfilled
9 Aboriginal and treaty rights claims. And I have three
10 (3) specific types of claims that I'm going to talk to
11 you about.

12 And then, secondly, I want to talk at a
13 macro level about the costs of social impacts and the
14 kind of social impacts that we're addressing. And then
15 hopefully I'll have time for a few remarks in
16 conclusion.

17 I -- I spelled out in -- still in the
18 fairly broad level of abstraction.

19

20 (BRIEF PAUSE)

21

22 DR. PETER KULCHYSKI: So in terms of
23 Aboriginal rights and titles as contingent liabilities,
24 this is an approach that was taken by Arthur Manuel,
25 who's now -- you know, who's been a co-chair of the

1 World Council of Indigenous Peoples, the former of the
2 -- one of the Shuswap Nations, and who I have the
3 pleasure to work with in an organization called
4 Defenders of the Land.

5 He developed the strategy in
6 coordination with Joseph Stiglitz, who's no mean name
7 in the world of economics. So, you know, there are
8 some very serious people who've signed off on the
9 notion that unfilled Aboriginal title and rights
10 responsibilities could be seen as contingent
11 liabilities that needs to be addressed in the financial
12 books of governments and organizations that have or are
13 using Aboriginal lands for some interest, such as
14 building a hydro dam.

15 I -- I -- there -- there may be others,
16 but I believe there are three (3) major potential legal
17 cases arising out of unfilled Aboriginal rights and
18 titles or treaty rights and titles claims in Northern
19 Manitoba. And I say a few words about each of those in
20 my report, but I'll say a few words here.

21 The first is the fact that it's not
22 widely known in Manitoba, but Tataskweyak, then called
23 Split Lake, the chief never signs the group adhesion to
24 the treaty. We don't have the chief's 1908 signature
25 on the treaty adhesion. Instead, what the chief signed

1 was an individual adhesion through what the -- the
2 treaty commissioner says was an error, although we
3 don't know that for sure. But he came back without the
4 chief's signature on the adhesion.

5 Everyone behaved as if the treaty had
6 been signed, but it's well documented. It's published
7 in a book called 'As Their Natural Resources Fail',
8 based on archival records, that they do not have -- and
9 they never corrected the error. They -- they do not
10 have the -- the chief's signature on an adhesion to
11 Treaty 5.

12 That means, potentially, Tataskweyak has
13 unsurrendered Aboriginal title to its whole traditional
14 territory, the value of which -- and I happen to have
15 worked many years in the Northwest Territories, in
16 Nunavut, on modern treaties comprehensive land claims.

17 So in the Sahtu region, which includes
18 about, I don't know, four thousand (4,000) people,
19 their modern treaty was worth about \$80 million. If,
20 as well as the treaty, damages were assessed, you know,
21 you could go from the tens of millions to the hundreds
22 of millions of dollars in value for that simple fact.

23 The -- the signature on the treaty is a
24 very, very important thing. The government spent huge
25 efforts doing it. And wherever there's a problem with

1 these sorts of things -- and, in fact, in the Northwest
2 Territories, they had a treaty. Treaty 11 had been
3 signed in 1921.

4 In spite of the presence of the treaty,
5 because of so many irregularities, they went ahead and
6 signed modern land claims worth in total hundreds and
7 millions of dollars if we look at each of the different
8 areas. So that's the first that I think is potentially
9 serious.

10 Second is the fact that Treaty 5, like
11 the other numbered treaties, in its what's called the
12 extinguishment clause or the surrender clause,
13 surrenders rights, titles, and interests to land within
14 a specified territory, lands only. And that was the
15 case of all of the numbered treaties.

16 In all of the modern treaties, from the
17 James Bay and Northern Quebec Agreement to the Western
18 Arctic Agreement, the Gwich'in Agreement, the Sahtu
19 Agreement, the Nunavut Agreement, in all of those, the
20 surrender clause has changed somewhat. And I quoted
21 the one from the Sahtu Agreement which says it
22 surrenders rights, titles, and interest to lands and
23 waters.

24 Potentially, if -- if the courts were to
25 acknowledge that in Treaty 5 there was no surrender of

1 waters -- and if the government thought water didn't
2 need to be surrendered, one would wonder why, over the
3 last thirty (30) years, it's been going through a lot
4 of efforts to include water on the surrender documents.

5 That would mean that the -- all of the
6 Cree communities affected by hydro development still
7 have rights to the rivers. We know historically that
8 they actually charged passage. And we also know from
9 the Supreme Court that any custom, practice, or
10 tradition that's integral to the distinctive culture of
11 the First Nation -- and I'm quote the -- the Supreme
12 Court -- that's considered an Aboriginal right.

13 So if we pair the -- the Aboriginal
14 right fact with the fact that water rights have not
15 been surrendered, if we also look at culturally the
16 fact that women among Cree and Anishnaabe cultures have
17 a historical responsibility for water, and women
18 weren't engaged in the treaty process in any way, I
19 think you have a very significant liability there.

20 You would have a -- a title case over
21 rivers, and there you would have a serious issue of
22 damages because of the -- the dams that have already
23 been built. So you would be talking about hundreds of
24 millions of dollars in liabilities, in contingent
25 liabilities, which could become actual liabilities.

1 And the third Aboriginal rights issue
2 that I think is of some significance has to do with the
3 Northern Flood Agreement. It's important to note that
4 the Northern Flood Agreement was negotiated before the
5 Constitution in 1982. The Constitution then recognized
6 Aboriginal and treaty -- existing Aboriginal and treaty
7 rights.

8 If we were to apply the now-standard
9 case, the Seewee (phonetic) case, on what is a treaty,
10 they said -- the courts say you have to take a liberal
11 and generous perspective, you have to look at the
12 capacity of the parties involved, you have to look at
13 the nature of the documents. Under any of those
14 criteria, certainly any reading of the Seewee case, we
15 would say the Northern Flood Agreement is a treaty.

16 This becomes -- actually, it's not an
17 innocuous statement. It becomes a very significant
18 financial statement. The reason why is because to
19 change a treaty, you need a constitutional amendment.
20 There have been several so-called implementation
21 agreements signed subsequent to the 1990s that purport
22 basically to erase the liabilities that were engaged in
23 through the Northern Flood Agreement.

24 I contend that those implementation
25 agreements, unless they're accompanied by a

1 constitutional amendment, are not worth the paper
2 they're written on; that all the liabilities under the
3 Northern Flood Agreement still exist for all of the
4 Northern Aboriginal communities.

5 And again, we're talking about very
6 significant liabilities that could run into the
7 hundreds of millions of dollars.

8 So those are three (3) off the top of my
9 head. There are other Aboriginal and treaty rights
10 issues in these communities, but those are the three
11 (3) that seemed to me to be, in terms of economic
12 value, which I know is your concern, the -- the ones
13 that are most significant.

14 And, you know, you can say this is
15 irrelevant; this won't make much difference. You know,
16 the relocation of the St. Peter's Reserve to Peguis
17 some might say would never have reached the courts.
18 You know, it's led to a significant cash payment to the
19 Peguis Reserve.

20 The Metis land claim, again, you know,
21 in the -- when scrip was being negotiated and was being
22 settled, you know, people thought it might not be worth
23 a lot. It's come to be, you know, valued significantly
24 high.

25 These are cases that will reach -- that

1 will be adjudicated through the courts if they're not
2 dealt with in a proper fashion. And part of the reason
3 for that is because the conditions in these -- in the
4 communities, particularly now if we're talking about
5 the communities affected by the proposed dams, but in
6 fact all of the hydro-affected communities, are very
7 bad.

8 And I want to turn -- that's the second
9 part of my presentation, looking at the social costs.
10 In fact, I believe, you know, for forty (40) years,
11 every time it builds a dam, Hydro promises prosperity
12 to the local peoples. That prosperity has not arrived.

13 I went -- part of the reason I'm here
14 today is I went to an uprising in Tataskweyak two (2)
15 years ago, in the spring of 2012, over the appalling --
16 and I underscore the word -- the appalling housing
17 conditions that continue to prevail there. In a
18 certain sense, it's even worse than Gillam, where Hydro
19 builds beautiful houses for its employees and allows --
20 you know, and admits in the Clean Environment
21 Commission Hearings that what it wants to see for First
22 Nations, the most cost-effective housing, are mobile
23 modular units, which translates into trailers. So
24 trailers are good enough for First Nations people, and
25 houses are good enough for Hydro employees.

1 We are creating, and we are continuing
2 to create, a province of haves and have-nots. And that
3 creates an economic cost both in terms of the social
4 payments that we have to make to support the have-nots
5 and, you know, in terms of, I don't know, the cost in
6 human misery. I know ethics is like a ghost in this --
7 these proceedings, but I think, as Manitobans, we have
8 to -- if we're concerned about the future, we have to
9 be concerned about the immiseration of Northern Hydro-
10 affected communities.

11 All Hydro is offering them through this
12 process, as far as I can see, is more promises. It's
13 my absolutely considered belief -- I have to keep an
14 eye on the time here -- that more dams should not be
15 built until some of those promises are fulfilled, until
16 we actually see some prosperity in the Hydro-affected
17 communities.

18 Right now, Hydro can take leaders from
19 the communities and travel around and -- and tout the
20 deals that it's signing. It will never take anyone
21 into the communities to show them to prosperity the
22 deals have created. It won't go there itself to talk
23 about the prosperity the deals have created, because it
24 has not created prosperity. It's created misery, and
25 misery far worse than we see in the non-Hydro-affected

1 communities. And this has to stop.

2 And I believe the only way it will stop
3 is if we tell them, You don't get your new dams, you
4 don't get your new toys until you actually address the
5 situation that exists in the present. And I -- I
6 believe that will make an effort on the part of all
7 Manitobans. I believe we should come to you for a
8 small rate increase to improve the material and social
9 infrastructures of Hydro-affected Aboriginal
10 communities, if that's what it takes.

11 But somehow that business has to be
12 accomplished first before more dams are built. I'm
13 absolutely convinced of that. We cannot be creating a
14 -- a province where, you know, the haves benefit more
15 and the have-nots are worse off and just let this
16 continue.

17 Now, one specific element about the
18 social impact that I want to draw your attention to,
19 that's actually incalculable, is what these dams will
20 actually do is affect among the last trap lines that
21 are in the near -- contiguous with the affected
22 communities. The Tchiakesiks (phonetic) trap line,
23 the Mason (phonetic) trap line, the Jack Mason
24 (phonetic) trap line, the late Frank Beardy's trap line
25 are among the last trap lines that immediately

1 accessible from Tataskweyak and from Gillam.

2 And so what we're doing -- and, you
3 know, in my experience, and I've travelled to a lot of
4 Northern indigenous communities, it's the hunting
5 families, the families that are still living a land-
6 based way of life, who are in many cases the last
7 social support, the last strong, intact families in
8 those communities. Those are the families we're now
9 proposing, cut their last link to the land.

10 We might think, Oh, there's just a few
11 trap lines, it's just a few people. But those are the
12 people who are the -- the last social bedrock of their
13 community. Without them, the community experiences
14 total anomie, total disarray, a complete social
15 dysfunction that a few million dollars sometime down
16 the road, that will be managed by a small local elite,
17 is not going to come close to repairing.

18 We are creating, I think, an
19 extraordinary social disaster. And, you know, we're
20 sleepwalking through it. So I urge you as a panel to
21 reject both of these projects and send Hydro back to
22 the table and say: Your first project should be to
23 live up to the promises you made forty (40) years ago.
24 Deal with that. If you can build beautiful houses for
25 your employees, what will it take to build those kind

1 of houses for the First Nations communities?

2 Let's make communities where we can
3 actually go into the community with pride and say, This
4 is what we've built, as well as this huge -- these huge
5 resource projects. Then I think we could start talking
6 about new mega projects. Until then, I think we're
7 whistling on the road to disaster. Thank you very
8 much.

9 THE CHAIRPERSON: Just a question for
10 you, Mr. Kulchyski. I just want to make sure that --
11 have you had an opportunity to read the -- the
12 information that Manitoba Hydro provided to us in
13 respect of the initiatives that they've undertaken to
14 address the mitigation of effects flowing from these --
15 from the dams?

16 Have you -- have you had an opportunity
17 to consider that?

18 DR. PETER KULCHYSKI: Because I wasn't
19 an Intervenor, I didn't look at anything for this
20 process, but I did read extensively the reports they
21 prepared for the Clean Environment Commission, where I
22 did play a role. And I'll have to say I'm not
23 impressed. And mostly it deals with what may happen in
24 the future.

25 We know that there's a small bump of

1 employment that goes with each of these projects. If
2 the experience of the Wuskwatim dam is anything of
3 value -- you know, I -- I wish someone had -- had done
4 -- I wish I myself had sponsored a very good study of
5 the -- the training that happened in Wuskwatim. I know
6 that the local band, there was a blockade for a while
7 on the road because people were very unhappy.

8 That what we tend to have is a racially
9 stratified workforce, where Aboriginal people are at
10 the very bottom of the employment pattern and they go
11 and stay in the jobs for a brief period of time,
12 generally is the pattern, and leave. And the reason
13 why is because they're at the bottom and they're being
14 treated like they're at the bottom, and they don't like
15 to stay in that environment.

16 So you've got a few temporary jobs that
17 don't last, that tend to be demeaning for the people
18 who take them, and you have a huge camp nearby that has
19 a -- a number of very negative social consequences for
20 the community. I'm particularly very concerned about
21 what -- what -- well, you know, we interviewed a woman
22 from Gillam who's -- was happy to have her name on the
23 public record and tell her story, Nancy Beardy, who had
24 been sexually assaulted during one of the previous
25 Hydro ventures.

1 So I've sort of made it a concern to
2 talk everywhere I can about we need to be doing more
3 around, you know, support for women and preventing
4 sexual assaults, and Hydro just tells us they're going
5 to do the same old thing, and that that's enough. And
6 to me, it's not enough.

7 THE CHAIRPERSON: Okay. There are no
8 other further questions, so I appreciate your taking
9 the time and trouble to come in and speak to us. And
10 your comments have been noted, and they will appear on
11 the -- on the -- the record of these proceedings and
12 will be part of the consideration of the panel. Thanks
13 very much for that.

14 DR. PETER KULCHYSKI: Thank you very
15 much. Cheers.

16 THE CHAIRPERSON: I believe that we're
17 ready to -- we'll need a bit of time, so we'll stand
18 down for a -- a minute or two (2).

19

20 --- Upon recessing at 1:01 p.m.

21 --- Upon resuming at 1:07 p.m.

22

23 THE CHAIRPERSON: Good afternoon. I
24 believe that we're ready to resume today's -- this --
25 today's proceedings. So with that, I'll turn it over

1 to Ms. Ramage, please.

2 MS. PATTI RAMAGE: Thank you, and good
3 afternoon, Mr. Chair. We have circulated a fair bit of
4 paper in the last few minutes, and I thought I'd run
5 through what that is that we've handed out, and the
6 plan for the afternoon.

7 The first things to deal with are
8 Manitoba Hydro has provided some further responses to
9 undertakings. The first one (1) in the -- in my pile
10 is Manitoba Hydro Exhibit 166, and this is a response
11 to Manitoba Hydro Undertaking Number 79, and this was
12 where Manitoba Hydro was to produce the capital cost
13 sensitivity found at Slide 11 and essentially add Plan
14 5 to the multiple accounts analysis. So that will be
15 entered as Manitoba Hydro Exhibit 166.

16

17 --- EXHIBIT NO. MH-166: Response to Undertaking 79

18

19 MS. MARILYN KAPITANY: Ms. Ramage, just
20 before you go on, I apologize, but could you remind me
21 what Mr. Wojczynski's qualification was on that one?

22 MR. ED WOJCZYNSKI: Mr. Wojczynski does
23 not recollect the qualifications, and will have to go
24 dig them out, which I --

25 MS. MARILYN KAPITANY: Would that be an

1 undertaking?

2 MR. ED WOJCZYNSKI: I will undertake to
3 find out my qualifications on the undertaking were.

4 MR. BYRON WILLIAMS: Mr. Williams might
5 be able to refresh Mr. Wojc -- Wojczynski's memory. I
6 -- I think this was a -- a question I had posed to Dr.
7 Shaffer, and I had asked if he would insert Plan 5 into
8 the analysis, and he said yes, and then there was some
9 discussion, because Mr. Wojczynski wanted to double-
10 check that the base information was available. Does --
11 does that refresh your memory at all, Mr. Wojczynski?

12 MR. ED WOJCZYNSKI: It's useful to have
13 people younger than me around, and that sounds right,
14 yes. Well, I don't believe we have a need for the
15 undertaking anymore.

16 MS. MARILYN KAPITANY: I agree. Thank
17 you.

18 MS. PATTI RAMAGE: Okay. And the
19 second document is -- is identified as Manitoba Hydro
20 Exhibit 104-10, and this is further information in
21 terms of the economic evaluation update. So that --
22 that'll be filed in the group with Exhibit 104.

23

24 --- EXHIBIT NO. MH-104-10: Further information on the
25 economic evaluation update

1 MS. PATTI RAMAGE: And next, Manitoba
2 Hydro has produced its book of documents in three (3)
3 parts. The first part is identified as LCA Volume I.
4 I would suggest that be made Manitoba Hydro Exhibit
5 167.

6
7 --- EXHIBIT NO. MH-167-1: First volume of Manitoba
8 Hydro's book of documents
9 identified as LCA Volume I

10

11 MS. PATTI RAMAGE: Then Volume II would
12 be one (1) -- and I guess I should say 167-1, and
13 Volume II would be 167-2.

14

15 --- EXHIBIT NO. MH-167-2: Volume II

16

17 MS. PATTI RAMAGE: Ms. Boyd wanted me
18 to point out that's the much thinner volume, and Volume
19 III, also Ms. Boyd's though, is -- is 167-3, and that
20 would be the financials. And the reason it's in a
21 separate volume is it has these fancy accordion tables
22 in here, so they've been reproduced in a large enough
23 form that they can actually be viewed with the naked
24 eye.

25

1 --- EXHIBIT NO. MH-167-3: Volume III

2

3 MS. PATTI RAMAGE: So the -- the plan
4 for this afternoon is that I will begin the cross and
5 work through Volume I. We will -- when I am complete,
6 Ms. Moroz, who you met earlier back when we were on
7 direct, she is our counsel who deals with all matters
8 transmission, and she has a few questions on her area
9 of practice, and then we'll be turning the mic over to
10 Ms. Boyd to -- to bring it home.

11 So you won't get -- well, I -- I am
12 satisfied you will get tired of me, but there is an end
13 in sight.

14

15 IEC LA CAPRA ASSOCIATES PANEL CONTINUED:

16 DANIEL PEACO, Previously Affirmed

17 JOHN ATHAS, Previously Affirmed

18 MARY NEAL, Previously Affirmed

19

20 CROSS-EXAMINATION BY MS. PATTI RAMAGE:

21 MS. PATTI RAMAGE: Good afternoon, Mr.
22 Peaco, Mr. Athas, and Ms. Neal. I don't think we've
23 actually formally been introduced, perhaps back in the
24 -- when we did the workshops, but I'm Patti Ramage,
25 counsel for Manitoba Hydro, and as you heard, Ms. Boyd

1 and Ms. Moroz will be also participating in the cross-
2 examination this afternoon.

3 If I could have you turn to the book of
4 documents, Volume I, and that's the document I'll be
5 dealing with, so the other two (2) can be set aside for
6 now. If we could turn to Tab 1 of that document? And
7 this would be Appendix 1, page 3 of your report, and
8 here we're dealing with Manitoba Hydro's planning
9 criteria.

10 And would you agree that the purpose of
11 the generation planning criteria is to ensure that
12 there are sufficient resources to meet Manitoba load
13 reliably, and it's used to determine when new resources
14 are required?

15 MR. DANIEL PEACO: Yes.

16 MS. PATTI RAMAGE: And you had an
17 exchange yesterday with Dr. Bel, and I just wanted to
18 clarify for the record. I think you and I are going to
19 be on the same page. I want to make sure that the
20 panel is on the same page with us. And at transcript
21 page 5,731, for the record -- it's not necessary to
22 turn there. Actually, it started with a question from
23 Dr. Bel, and he asked:

24 "I'm wondering if by changing that
25 constraint, it allows us to utilize

1 the existing hydro system more
2 efficiently."

3 And in your reply, you said the
4 following.

5 "In drought conditions, the import
6 capacity today limits the amount of
7 energy you can import in those
8 circumstances, so this gives you more
9 -- more division freedom..."

10 I think the word 'division' shouldn't
11 have been there. I'm going to read it without that
12 word.

13 "So this gives you more freedom in
14 order to take advantage of off-peak
15 prices to import and -- and manage
16 the reservoir differently than you
17 can with the limitations on the
18 import as it -- as it sits today."

19 Do you recall that exchange?

20 MR. DANIEL PEACO: Yes, and I think
21 it's probably the degrees of freedom.

22 MS. PATTI RAMAGE: Good. I was trying
23 to figure out what that word would have been. And I
24 just wanted to confirm that the comments you made
25 pertain only to the long-term planning of -- of

1 Manitoba Hydro, and that in the operational time
2 horizon, there are no restrictions on imports.

3 Would you agree with that? Restriction
4 on imports imposed by the planning criteria.

5 MR. DANIEL PEACO: Well, there -- there
6 are firm import limits on the system that would limit
7 the planning criteria. To the -- to the extent that
8 you wanted to rely on firm imports in excess of the
9 firm transfer limits, you'd be precluded from that.

10 MS. PATTI RAMAGE: Okay, we're in
11 agreement so far. So when we are in a drought -- just
12 to make it clear for the panel, when we're in a
13 drought, Manitoba Hydro can import as much as we can,
14 up to 100 percent of the capability of the line, and
15 the planning criteria would have no bearing on what we
16 do in that operational time frame?

17 MR. DANIEL PEACO: Right. The planning
18 criteria governs your planning choices.

19 MS. PATTI RAMAGE: Perfect. And
20 there's two (2) parts to the planning criteria,
21 correct, the capacity criterion and the energy
22 criterion?

23 MR. DANIEL PEACO: Yes.

24 MS. MARILYN KAPITANY: Could I just
25 ask, how does the 10 percent restriction that we talked

1 quite a bit, how does that relate to what we're talking
2 about here? The -- the import restriction is what I'm
3 referring to.

4 MR. DANIEL PEACO: That's -- that's
5 part of the -- the planning criteria, the energy
6 planning criteria, that Ms. Ramage is referring to.

7

8 CONTINUED BY MS. PATTI RAMAGE:

9 MS. PATTI RAMAGE: So, Mr. Peaco, when
10 our planners are making long-term plans, they use the
11 planning criteria to -- it places limitations around
12 their plans.

13 So one would be the 10 percent
14 limitation in the planning criteria, correct?

15 MR. DANIEL PEACO: Correct.

16 MS. PATTI RAMAGE: But when we're in
17 the real-time time frame and whether it's a drought or
18 high water conditions -- well, it would be a -- we're
19 going to talk about a drought if we're talking about
20 imports.

21 If Manitoba Hydro is looking to import,
22 in the real time frame, they can do whatever they like
23 --

24 MR. DANIEL PEACO: Sure.

25 MS. PATTI RAMAGE: -- in terms of

1 importing, subject only to the size of the line?

2 MR. DANIEL PEACO: Yeah, I was going to
3 say subject to the physical limits of the -- of the
4 transmission, yes.

5 THE CHAIRPERSON: Just drought or is
6 any of the other -- any time?

7

8 CONTINUED BY MS. PATTI RAMAGE:

9 MS. PATTI RAMAGE: To confirm any time
10 in the -- in -- in the -- in real time.

11 MR. DANIEL PEACO: Yeah. In -- in real
12 time the -- the ratings of the lines won't necessarily
13 -- just back up. Just -- maybe as -- as we may get --
14 get there. So let me just -- for purposes of
15 reliability planning, there'll be studies done to
16 determine a -- a firm transfer limit across an
17 interface, say between Manitoba, and so that -- that --
18 that's basic -- in shorthand is a -- is a rating where
19 you expect you can always count on having abil -- at
20 least that much transfer capability between systems.

21 But on certain weather conditions and
22 certain loading conditions, the -- the physical thermal
23 limits of the lines may -- may be much larger than that
24 number. And so there may be times where the lines can
25 actually move more power for a period of time, maybe on

1 an interruptible basis, but -- but larger than that
2 number. So if you're planning on capacity the, firm
3 transfer limits really are what you're -- what you're
4 looking at for reliability. But there may be times
5 where this -- the lines are actually -- can, at least
6 for a period of time, move more power than that.

7 Does that -- does that help?

8 MS. PATTI RAMAGE: I'm going to just
9 follow up a little more to make sure we're all on the
10 same page. The -- the planning criteria is used by Ms.
11 Flynn's group to establish the date of need for
12 generation, but it's -- and if you understand our
13 people it's not used by Mr. Cormie's group to establish
14 what we're going to do in the operational time frame.

15 MR. DANIEL PEACO: Yes, we're on the
16 same page.

17 MS. MARILYN KAPITANY: Yes, but then
18 when you described Plan 17 and one of the things you
19 said in there was to relax the 10 percent restriction,
20 in real life there is no 10 percent restriction then.

21 Is that what you're saying?

22 MR. DANIEL PEACO: No. In -- in the
23 planning criteria there's a restriction. So the amou -
24 - the amount to which the planning criteria will --
25 would allow Hydro to entertain a plan that relied firm

1 imports above that level would be precluded. So they -
2 - they'll only consider allowing that -- that much of
3 the portion of their firm system to be tied to -- to
4 imports, and the rest would need to be internal to the
5 system as -- as a planning choice.

6 And so in the -- in the case that we
7 looked at, we said relax that. So in terms of
8 determining when more capacity was needed, we --
9 they'll -- we basically allowed the system to contract
10 for import to a higher level as a planning decision as
11 part of setting up that case. Does that -- if that
12 makes -- if that helps.

13 MS. MARILYN KAPITANY: Yeah.

14 MR. DANIEL PEACO: So, yeah.

15

16 CONTINUED BY MS. PATTI RAMAGE:

17 MS. PATTI RAMAGE: I'm going to try to
18 break it up one -- a little bit closer. Manitoba Hydro
19 has a responsibility to ensure that its -- has -- has -
20 - to ensure for the safe and reliable provision of
21 power to Manitobans.

22 Is that your understanding of the
23 Corporation's mandate?

24 MR. DANIEL PEACO: Yes, you and every
25 other utility.

1 MS. PATTI RAMAGE: Yes. And when we
2 are planning, we plan -- for planning purposes we have
3 a long-term planning out -- outlook.

4 MR. DANIEL PEACO: Yes.

5 MS. PATTI RAMAGE: We can't plan for
6 tomorrow today or we will not have power likely, if all
7 of our plans were made in a twenty-four (24) hour
8 period. We need years ahead to make planning
9 decisions.

10 MR. DANIEL PEACO: Yes.

11 MS. PATTI RAMAGE: And so for planning
12 decisions, essentially the planning criteria -- and I'm
13 going to go out on a limb and these guys will probably
14 be shaking their heads.

15 MR. DANIEL PEACO: I see you're on a
16 short leash there.

17 MS. PATTI RAMAGE: Yeah. Hope is not a
18 plan for our planners, and therefore they need some
19 sort of limitations around what -- what they can plan
20 to. And so when Ms. Kapitany refers to the 10 percent,
21 a limitation that Manitoba Hydro has put on is that you
22 cannot -- you -- you cannot assume more than 10 percent
23 when you're planning and that that plan -- so that
24 you're planning -- you're going to assume 10 percent
25 and you have to design the system so that you only

1 assume 10 percent imports, because we need to know that
2 there is going to be energy available in this province.

3 That is very long. I'm just trying to -
4 - to make it clear.

5 THE CHAIRPERSON: So 10 percent of your
6 eggs in one (1) basket?

7

8 CONTINUED BY MS. PATTI RAMAGE:

9 MS. PATTI RAMAGE: I think you may have
10 it, for planning purposes. But when it comes to the
11 actual operational, if there's 50 percent of the eggs
12 in the basket and there's a drought, we can pull all
13 the eggs out.

14 Would that be a fair analogy following--

15 MR. DANIEL PEACO: Yeah, and again,
16 subject to the -- the -- to the limits of the
17 transmission system.

18 MS. PATTI RAMAGE: Okay. Now, we were
19 talking about the two (2) parts to the planning
20 criteria. And the first is the capacity criteria. And
21 it is reproduced on -- on page 1 of the book of
22 documents. And I will read it into the record. It's:

23 "Manitoba Hydro will plan to carry a
24 minimum reserve against breakdown of
25 plant, an increase in demand above

1 forecast of 12 percent of the
2 Manitoba forecast peak demand each
3 year plus reserve required by any
4 export contract in effect at the
5 time."

6 Now, did I read that correctly?

7 MR. DANIEL PEACO: Yes.

8 MS. PATTI RAMAGE: So the purpose of
9 the 12 percent reserve is to act as a safeguard so that
10 the lights stay on even if Manitoba Hydro experiences
11 plant breakdown or if demand exceeds forecast because
12 of extreme weather.

13 Would that be correct?

14 MR. DANIEL PEACO: That's correct.

15 MS. PATTI RAMAGE: And to do this, the
16 -- the capacity criteria requires Manitoba Hydro carry
17 a minimum reserve equal to 12 percent of the forecasted
18 Manitoba peak demand each year, together with a reserve
19 equal to the terms of any export contracts in effect at
20 that time.

21 Is that correct?

22 MR. DANIEL PEACO: That's what it says,
23 yes.

24 MS. PATTI RAMAGE: And La Capra
25 concluded that the capacity criterion is reasonable and

1 consistent with industry standards.

2 Is that fair?

3 MR. DANIEL PEACO: Yes, it's very
4 similar to what MISO uses, for example.

5

6 (BRIEF PAUSE)

7

8 MS. PATTI RAMAGE: Now, if we turn to
9 the energy criterion, it's also set out at Tab 1, and
10 I'm going to read it into the record:

11 "The Corporation will plan to have
12 adequate energy resources to supply
13 the firm energy demand in the event
14 that the lowest recorded coincident
15 water supply conditions are repeated.
16 Imports may be considered as
17 dependable energy resources, provided
18 they utilize firm transmission
19 service and are sourced from either
20 an organized power market or a
21 bilateral contract. The total
22 quantity of energy considered as
23 dependable energy from import shall
24 be limited to that which can be
25 imported during the off-peak period

1 and shall not exceed the quantity of
2 export contracts in effect at the
3 time, plus 10 percent of Manitoba
4 load."

5 So first off, can you confirm I read
6 that in correctly?

7 MR. DANIEL PEACO: You're doing well.

8 MS. PATTI RAMAGE: I've said it before,
9 I'm an excellent reader. Now, Appendix 1, page 17 of
10 your report, and it's not necessary to go there, you
11 indicate that requiring dependable resources to be
12 available in the event of a repeat of the driest flow
13 conditions is generally consistent with other hydro-
14 dependent systems.

15 Have I got that right?

16 MR. DANIEL PEACO: I don't have it in
17 front of me, but I'll -- I'll accept your
18 representation.

19 MS. PATTI RAMAGE: It's -- for the
20 record, if you wanted to check it's Appendix 1, page
21 17. But I -- if you accept that subject to check,
22 I'll...

23 MR. DANIEL PEACO: Split the screen and
24 put it up?

25 MS. PATTI RAMAGE: It's -- it's Tab 5

1 in the book of documents if you wanted to check.

2

3 (BRIEF PAUSE)

4

5 MR. DANIEL PEACO: Okay. So we're --
6 what was the passage you were referring to?

7 MS. PATTI RAMAGE: I'm essentially
8 narrowing down what we agree on and what we don't agree
9 on.

10 MR. DANIEL PEACO: Okay.

11 MS. PATTI RAMAGE: So what we agree on
12 is that requiring dependable resources to be available
13 in the event of a repeat of the driest flow conditions
14 is generally consistent with other hydro-dependent
15 systems?

16 MR. DANIEL PEACO: Yes.

17 MS. PATTI RAMAGE: But what you've
18 taken issue with is that Manitoba -- what -- is what
19 Manitoba Hydro's prepared to count on as dependable
20 energy. And as I understand it, you believe the
21 limitation to 10 percent of Manitoba load plus export
22 obligations is not supported by analysis. And you're
23 also of the view that limiting the amount of dependable
24 energy to that which can be imported during the off-
25 peak isn't supported. And those are the two (2)

1 concerns I -- I'd like to explore.

2 And if I could have you turn to Tab 3 of
3 the book of documents. Now, at Appendix 1, page 8 of
4 your report, you compare Manitoba Hydro's dependable
5 energy requirements to that of BC Hydro and Bonneville
6 Power Administration and state that, quote:

7 "Manitoba Hydro's approach to
8 determining dependable energy
9 requirements is largely similar to
10 other dependent -- hydro-dependent
11 systems."

12 Do you see where I've read that, the
13 first paragraph under the map, the top of it?

14 MR. DANIEL PEACO: Yes.

15 MS. PATTI RAMAGE: So would I be
16 correct that the three (3) utilities we're speaking of
17 -- BC Hydro, Bonneville Power, and Manitoba Hydro --
18 their dependable energy requirements are similar in
19 that all three (3) are large hydro, heavily dependent
20 on hydro resources, and they use the driest historical
21 flow year to determine the minimum dependable energy
22 available for its hydro generating units?

23 Is that correct?

24 MR. DANIEL PEACO: Yes.

25 MS. PATTI RAMAGE: Now, you go on to

1 assert that where these utilities differ is in their
2 treatment of out-of-system resources. For example, you
3 point to the fact that commencing in 2016, BC's
4 standard will require it to have domestic resources to
5 fill -- fulfill load during the average water
6 conditions.

7 Now, I'd like you to turn to Tab 7 of
8 the book of documents so we can compare the BC and
9 Manitoba Hydro systems. And here I'm looking for page
10 14 in that tab.

11

12 (BRIEF PAUSE)

13

14 MS. PATTI RAMAGE: Just to clarify, for
15 the record, it appears to me that somehow the numbering
16 system went wrong. It gos 14 -- page 14, 16. There is
17 no page missing.

18 Now, in this page we've included
19 Manitoba Hydro's rebuttal evidence. And I'm looking in
20 particular at page 53, Table 1 on that page.

21 In this table, the permitted energy
22 imports of BC Hydro are compared to Manitoba Hydro.
23 Are you familiar with the table?

24 MR. DANIEL PEACO: I think I've seen it
25 before, but I...

1 MS. PATTI RAMAGE: Okay. Well, let's -
2 - we'll walk through it. So if we start by looking at
3 the difference in domestic energy demand of Manitoba
4 versus BC, you'd agree that, according to the figures
5 on the table, the BC domestic energy demand net of DSM
6 in 2016/'17 is projected to be 58,874 gigawatt hours.

7 Do you see that? In the column under BC
8 Hydro, it's the fourth row down. And that 58,000 --

9 MR. DANIEL PEACO: Fifth row?

10 MS. PATTI RAMAGE: You are correct,
11 fifth row. I'm a better reader than a counter. So
12 it's the fifth row down. And that compares to Manitoba
13 Hydro load of 25,960 gigawatt hours?

14 MR. DANIEL PEACO: I see that.

15 MS. PATTI RAMAGE: And do you accept
16 those figures, subject to check?

17 MR. DANIEL PEACO: I'll accept your
18 figures.

19 MS. PATTI RAMAGE: Now, the table also
20 contains the permitted imports of the two (2)
21 utilities. And to make sure we're working from the
22 same page, by permitted imports, we are meeting imports
23 that the utilities are authorized to include in their
24 dependable energy calculation.

25 Can we agree on that?

1 MR. DANIEL PEACO: Say that again.

2 MS. PATTI RAMAGE: 'Permitted imports'
3 means the imports that the utilities are authorized to
4 include in their dependable energy calculation?

5 MR. DANIEL PEACO: Where do you see
6 that?

7 MS. PATTI RAMAGE: Well, I'll tell you
8 what. We'll -- I'll carry on. And that's my
9 understanding of it. That's how I'm using the term.

10 MR. DANIEL PEACO: I don't get it from
11 the -- from the document here, that's all.

12 MS. PATTI RAMAGE: We'll -- we'll walk
13 through and we'll -- we'll get there then. Now,
14 Manitoba Hydro indicates that -- that BC Hydro's
15 permitted imports are projected to be 4,100 gigawatt
16 hours, and you'll see that in the -- I'm going to call
17 it the third row down, and compared to Manitoba Hydro's
18 permitted imports of 3,068 gigawatt hours.

19 Do you see -- do you see that?

20 MR. DANIEL PEACO: I see those numbers,
21 yeah.

22 MS. PATTI RAMAGE: All right. And La
23 Capra itself calculated what I call the permitted
24 imports themselves at page 1-11 of your evidence.
25 That's at Tab 4, if you'd like to double check that

1 number.

2 MR. DANIEL PEACO: Yes. I see that.

3 MS. PATTI RAMAGE: Okay. And if we
4 could turn to Tab 8, we can -- we'll walk through how
5 BC Hydro's permitted imports are calculated. And this
6 is an excerpt from BC Hydro's Integrated Resource Plan.
7 It's Appendix 3C at page 1.

8 And here, BC Hydro defines the term
9 FELCC, and that's capital 'F', capital 'E', capital
10 'L', capital 'C', capital 'C', for the court reporter,
11 FELCC. It's an acronym for 'firm energy load carrying
12 capability'.

13 And you'll see on the page, it defines
14 FELCC as the maximum amount of annual energy that a
15 hydroelectricity system can produce under critical
16 water conditions.

17 Would you agree that the BC Hydro term
18 'FELCC' is what Manitoba Hydro refers to as dependable
19 energy?

20 MR. DANIEL PEACO: Yes. It looks -- it
21 looks to be the same definition.

22 MS. PATTI RAMAGE: And if I could have
23 you then turn the page to Tab 9 of the book of
24 documents, and here we're at page 21 of the same
25 report. And if you could look at the statement

1 beginning at line 6, and as you're reading it, I will
2 read it into the record:

3 "The FELCC of BC Hydro's heritage
4 hydro resources, including resource-
5 smart upgrades and the Waneta
6 transaction, is approximately 44,100
7 gigawatt hours per year in fiscal
8 2017. The difference between the
9 heritage hydro average energy
10 capability and FELCC is 4,100
11 gigawatt hours per year, which is the
12 average non-firm energy capability of
13 the hydro -- of the heritage hydro
14 resources. Reliant on this 4,100
15 gigawatt hours per year means that,
16 on an operational basis, if heritage
17 hydro water conditions are lower than
18 average, IPP non-firm energy/market
19 purchases may be required to replace
20 non-firm hydro."

21 Did you see that? And did I read it
22 correctly?

23 MR. DANIEL PEACO: You're on a roll.

24 MS. PATTI RAMAGE: And if I can try to
25 translate that now into English and see if you agree

1 with my non-engineering version of what that said, it's
2 -- a few moments ago we agreed that the BC energy
3 criterion is different from Manitoba Hydro's, because
4 BC requires its utility to have domestic resources to
5 fill -- fill load on an average flow year as opposed to
6 the dependable year.

7 MR. DANIEL PEACO: Sorry, where --
8 where are you?

9 MS. PATTI RAMAGE: I'm just -- I'm --
10 this is my interpretation of what that paragraph means.
11 I just want you to confirm that that's --

12 MR. DANIEL PEACO: I was trying to find
13 where you were reading, and I -- I missed the thread.

14 MS. PATTI RAMAGE: Well, what I'm
15 saying is, what this paragraph means is that the -- the
16 BC energy criteria requires it to have domestic
17 resources to fulfil load during an average flow year,
18 and that paragraph establishes that the difference
19 between the average energy and dependable energy is
20 4,100 gigawatt hours.

21

22 (BRIEF PAUSE)

23

24 MR. DANIEL PEACO: All right. Can you
25 try that one (1) more time?

1 MS. PATTI RAMAGE: So what that
2 paragraph establishes is that the difference between
3 average energy and dependable energy is 4,100 gigawatt
4 hours. It's the non-firm portion of average energy,
5 and it's the -- it would therefore be the maximum --
6 projected maximum amount of energy BC can look to to
7 obtain from the market to meet its energy criterion.

8 MR. DANIEL PEACO: I guess I don't see
9 that last phrase in this paragraph.

10 MS. PATTI RAMAGE: No, that's me. I'm
11 -- is that what you read from this paragraph?

12 MR. DANIEL PEACO: Well, everything up
13 to --

14 MS. PATTI RAMAGE: Oh --

15 MR. DANIEL PEACO: -- the last
16 paragraph.

17 MS. PATTI RAMAGE: -- I'm sorry. Okay.
18 I am paraphrasing now. I'm sorry. I wasn't trying to
19 quote from the paragraph at that point. I was just
20 trying to put it into English for the Board.

21 MR. DANIEL PEACO: All I'm saying is
22 that -- that the first two-thirds (2/3) of your
23 paraphrase, I was with you, but the last part of it, I
24 don't see where you get that.

25 MS. PATTI RAMAGE: You agree on the

1 forty-one hundred (4,100). And that's the difference
2 between dependable and average energy?

3 MR. DANIEL PEACO: Well, I don't know
4 because you interpreted the forty-one hundred (4,100)
5 in the last part of your statement. The forty-one
6 hundred (4,100) is the difference between the
7 dependable and their average. I agree with that.

8 MS. PATTI RAMAGE: Okay, good. That's
9 --

10 MR. DANIEL PEACO: I'm with you that
11 far.

12 MS. PATTI RAMAGE: Okay. Well, we'll
13 stop there then.

14 MR. DANIEL PEACO: Okay. So if we go
15 back to Tab 7, to page 14.

16

17 (BRIEF PAUSE)

18

19 MS. PATTI RAMAGE: You're -- so we've
20 now established Manitoba Hydro has permitted imports of
21 3,068 gigawatt hours.

22 MR. DANIEL PEACO: I'm -- I'm sorry,
23 what tab are you...?

24 MS. PATTI RAMAGE: Tab 7, page 14.

25

1 (BRIEF PAUSE)

2

3 MR. DANIEL PEACO: I'm there.

4 MS. PATTI RAMAGE: Right. So Manitoba
5 Hydro's permitted imports are 3,068 gigawatt hours on
6 projected demand of 25,960 gigawatt hours.

7 And would you represent that that
8 represents -- the 3,068 permitted imports represents 12
9 percent of -- of domestic demand?

10 MR. DANIEL PEACO: Twelve percent?

11 MS. PATTI RAMAGE: 3,069 gigawatt hours
12 divided by 25,960 gigawatt hours of -- of domestic
13 energy demand.

14

15 (BRIEF PAUSE)

16

17 MR. DANIEL PEACO: So it's 12 percent
18 of the forecasted demand. Are you saying that the
19 numbers were derived as a 12 percent criteria?

20 MS. PATTI RAMAGE: No, no. It's that
21 the permitted imports, that's the -- the amount
22 Manitoba Hydro, under its energy criteria, is permitted
23 to import, we've agreed is 3,068 gigawatt hours.

24 MR. DANIEL PEACO: Based upon the 10
25 percent criteria.

1 MS. PATTI RAMAGE: That's correct.

2 MR. DANIEL PEACO: Okay.

3 MS. PATTI RAMAGE: And that that 3,068,
4 based on the 10 percent criteria -- oh. I've been
5 corrected. It's based on the overall energy criteria,
6 which would include the 10 percent criteria, but it's
7 the overall energy criteria.

8 MR. DANIEL PEACO: Okay.

9 MS. PATTI RAMAGE: But that would be
10 3,068 gigawatt hours. And that would represent, for
11 planning purposes, 12 percent of the projected load?

12 MR. DANIEL PEACO: Okay.

13 MS. PATTI RAMAGE: And if we perform
14 that same calculation for British Columbia with
15 permitted imports of 4,100 gigawatt hours and projected
16 energy demand of 58,874 gigawatt hours, would you agree
17 that the 4,100 gigawatt hours represents 7 percent of
18 BC's energy demand?

19 MR. DANIEL PEACO: What tab was the BC
20 reference where the forty-one (41) came from?

21 MS. PATTI RAMAGE: That was Tab 9.

22

23 (BRIEF PAUSE)

24

25 MS. PATTI RAMAGE: It may help you, Mr.

1 Peaco, to look at lines 10 through 12 on that page.
2 Relying on this 4,100 gigawatt hours a year means that,
3 on an operational basis, if heritage hydro water
4 conditions are lower than average, IPP non-firm energy
5 market purchases may be required to replace --

6 MR. DANIEL PEACO: Yeah, I'm just not
7 reading in that paragraph anywhere that -- where that -
8 - that's more than a -- nothing more than a statement
9 of the -- the condition of their system at the time.
10 It doesn't articulate the criteria.

11 MS. PATTI RAMAGE: If you could go back
12 to Tab 8, you will see their FELCC criteria.

13

14 (BRIEF PAUSE)

15

16 MR. DANIEL PEACO: Well, FELCC is a
17 criteria that defines dependable energy. It doesn't
18 define the extent to which their system can rely on
19 energy other than that.

20

21 (BRIEF PAUSE)

22 MS. PATTI RAMAGE: Okay. We'll back
23 up. BC Hydro uses not -- includes average -- average
24 energy amounts in its energy criteria, correct? That's
25 --

1 MR. DANIEL PEACO: I don't -- I haven't

2 --

3 MS. PATTI RAMAGE: -- what -- I think--

4 MR. DANIEL PEACO: -- I haven't --

5 MS. PATTI RAMAGE: -- we've established
6 that.

7 MR. DANIEL PEACO: -- I haven't -- no.

8

9 (BRIEF PAUSE)

10

11 MR. DANIEL PEACO: I guess my point is
12 I haven't seen in the document you've shown me an
13 articulation of their planning criteria.

14

15 (BRIEF PAUSE)

16

17 MS. PATTI RAMAGE: Mr. Peaco, if I
18 could re -- refer you to the La Capra report, and
19 that's at Tab 5, page 6 of the book of documents. And
20 it was in this -- in this excerpt from the report, I
21 believe La Capra acknowledged and -- and, in fact, it
22 was La Capra who raised this issue, that BC Hydro self-
23 sufficiency standards requires it to have domestic
24 resources to fulfill load during an aver -- average
25 flow year.

1 MR. DANIEL PEACO: Yeah, that's
2 referring to a self-sufficiency standard, not a
3 reliability standard.

4 MS. PATTI RAMAGE: For energy, is that
5 not the same thing?

6 MR. DANIEL PEACO: Give me a second.

7

8 (BRIEF PAUSE)

9

10 MS. PATTI RAMAGE: Mr. Peaco, it may
11 also help if you turn to page 22 of the book of
12 documents.

13 MR. DANIEL PEACO: Page 22?

14 MS. PATTI RAMAGE: And that's --

15 MR. DANIEL PEACO: Tab?

16 MS. PATTI RAMAGE: -- in Tab 9. And at
17 page -- at line 23, it indicates in BC:

18 "By planning to rely upon some volume
19 of non-firm heritage hydro energy
20 supported by the market, BC Hydro
21 will need to continue to assess the
22 markets to ensure that this reliance
23 will result in adequate cost-
24 effective supply for customers. The
25 degree of reliance upon non-firm

1 heritage hydro energy backed by the
2 market is termed 'BC Hydro's non-firm
3 market allowance', about 4,100
4 gigawatt hours per year in fiscal
5 2017."

6 And does that assist you?

7 MR. DANIEL PEACO: Yes, that's helpful.
8 Thank you.

9

10 (BRIEF PAUSE)

11

12 MS. PATTI RAMAGE: And a fair bit of
13 flipping around, but if we could go back to page 14 of
14 Tab --

15 MR. DANIEL PEACO: Sorry, what tab?

16 MS. PATTI RAMAGE: That's Tab 7. And I
17 just want to confirm that BC Hydro then has permitted
18 imports of 4,100 gigawatt hours, which represents 7
19 percent of their -- of their domestic energy demand?

20 MR. DANIEL PEACO: I see that.

21 MS. PATTI RAMAGE: So relative to the
22 size of domestic load, Manitoba Hydro allows more
23 imports than BC Hydro.

24 Is that correct? It's --

25 MR. DANIEL PEACO: I -- I see that.

1 MS. PATTI RAMAGE: Now, if we pay --
2 stay on Tab 7, and we turn to the second page, it's --
3 it's page 16 in the book of documents, Table 2, and
4 we'll walk through this one too. We see here -- we've
5 established that BC Hydro's domestic energy demand, net
6 of DSM, in 2016/'17 is 58,874 gigawatt hours.

7 It's roughly two (2) times larger than
8 Manitoba Hydro's, at twenty-five thousand nine sixty
9 (25,960). And then looking down that table, are you
10 prepared to accept that Manitoba Hydro's average hydro
11 energy in 2016/'17 is projected to be 30,808 gigawatt
12 hours?

13 MR. DANIEL PEACO: I'll take your
14 representation.

15 MS. PATTI RAMAGE: And that dependable
16 -- Manitoba Hydro's dependable hydro energy is 22,754
17 gigawatt hours.

18 Can you accept that, subject to check?

19 MR. DANIEL PEACO: Yes.

20 MS. PATTI RAMAGE: And in this table,
21 Manitoba Hydro refers to the difference between average
22 hydro energy and dependable hydro energy as the
23 critical drought energy deficit, and given that
24 definition, would you agree that the critical drought
25 energy deficit in Manitoba is 8,054 gigawatt hours?

1 That's 30,808 gigawatt hours of average energy less
2 22,754 gigawatt hours of dependable energy, the
3 difference between average and dependable. Yes.

4 MR. DANIEL PEACO: Well, I guess, it's
5 the difference between average and dependable, yes.

6 MS. PATTI RAMAGE: And in practical
7 terms, the critical drought energy deficit of 8,054
8 gigawatt hours represents the amount of water that
9 dries off in -- dries up in Manitoba in a critical
10 drought year as compared to an average year?

11 Is that a fair characterization?

12 MR. DANIEL PEACO: It's the diff --
13 it's the difference between average and dry, yes.

14 MS. PATTI RAMAGE: And then looking
15 back at the chart, at Table 2, you would accept -- are
16 you prepared to accept that BC Hydro's resource plan
17 indicates that average hydro energy in BC is 48,200
18 gigawatt hours?

19 MR. DANIEL PEACO: I'll take your
20 representation.

21

22 (BRIEF PAUSE)

23

24 MS. PATTI RAMAGE: And I think we've
25 already covered this in some of the quotes, but

1 dependable energy in BC is 44,100 gigawatt hours.

2 Do you accept that?

3 MR. DANIEL PEACO: Okay.

4 MS. PATTI RAMAGE: So the critical
5 drought energy deficit in British Columbia is 4,100
6 gigawatt hours. That's the same number we've been
7 speaking of. It's the average hydro energy less
8 dependable energy.

9 And do you agree with that calculation?

10 MR. DANIEL PEACO: I see that.

11 MS. PATTI RAMAGE: And I read a quote
12 in -- from Tab 8, page 20 a moment ago, and I'm not
13 going to read it again, but based on what you've heard,
14 would you agree that Manitoba Hydro's critical drought
15 energy deficit is equivalent to what BC had referred to
16 in their report as BC Hydro's non-firm/market
17 allowance?

18 MR. DANIEL PEACO: Yeah. I guess the
19 thing that's troubling me is in Manitoba Hydro's
20 system, labelling a critical drought energy, your
21 planning basically has you assuring you can cover
22 domestic load and firm commitments with your -- with
23 your dependable energy. It looks to me like Hydro --
24 BC Hydro is -- is allowing its -- it's relying on the
25 forty-eight (48) to do the same thing.

1 (BRIEF PAUSE)

2

3 MS. PATTI RAMAGE: I think -- I think
4 we're saying the same thing. BC is backstopping its --
5 its --

6 MR. DANIEL PEACO: Right.

7 MS. PATTI RAMAGE: -- energy deficit
8 with market purchases.

9 MR. DANIEL PEACO: Right, but I -- if
10 I'm understanding their criteria right, they're --
11 they're saying -- they're basically -- where -- whereas
12 Manitoba Hydro's criteria would say, Dependable energy
13 covers the -- the fact that you've got 31 percent
14 energy above dependable energy does not correlate to
15 the fact that you're relying on 30 -- that 31 percent
16 energy from the market to cover your firm obligations,
17 which is what you're implying by comparing to BC Hydro
18 in this way.

19 MS. PATTI RAMAGE: The -- what we're
20 looking for is the relative size of the drought compare
21 -- and -- and how the two (2) utilities react to that.

22 MR. DANIEL PEACO: All right. I can
23 stipulate to that, but -- but that wasn't what you
24 represented.

25

1 (BRIEF PAUSE)

2

3 MS. PATTI RAMAGE: Okay. Let's see if
4 we can do it this way. If we look at the column for BC
5 Hydro and each of the numbers we've just gone through,
6 and we look at the critical drought energy deficit as a
7 percentage of domestic energy demand, and it's as a
8 percentage of domestic energy demand, that represents 7
9 percent of BC load.

10 Is that correct?

11 MR. DANIEL PEACO: The seven (7) -- the
12 difference between their dependable energy and their
13 average energy is 7 percent, correct.

14 MS. PATTI RAMAGE: Right. And in
15 Manitoba, the difference between --

16 MR. DANIEL PEACO: Dependable energy
17 and average energy is 31 percent.

18 MS. PATTI RAMAGE: That's right. So on
19 a relative basis, and we'll make sure the panel has
20 this, in a critical drought, the worst drought in
21 historic record, it -- it's a much more severe event in
22 Manitoba than for BC Hydro, when comparing 31 percent
23 to 7 percent.

24 MR. DANIEL PEACO: Okay. So what --
25 what this tells --

1 MS. PATTI RAMAGE: Is that correct?

2 MR. DANIEL PEACO: -- what this tells
3 me is you have much more variability in -- in stream
4 flow than BC Hydro does, but your planning criteria
5 ignores everything above dependable for purposes of
6 supply.

7 MS. PATTI RAMAGE: That's correct. And
8 can you advise the panel what storage BC Hydro has as
9 compared to Manitoba Hydro?

10 MR. DANIEL PEACO: I don't have the
11 numbers.

12 MS. PATTI RAMAGE: Would you accept,
13 relative to check, that BC Hydro's storage capability
14 is roughly double Manitoba Hydro's?

15 MR. DANIEL PEACO: I -- that -- I would
16 accept your representation on that.

17 MS. PATTI RAMAGE: And as we walked
18 through earlier, when expressed as a portion of
19 domestic load, Manitoba Hydro already allows a greater
20 degree of BC -- of imports than BC Hydro.

21 Is that correct?

22

23 (BRIEF PAUSE)

24

25 MR. DANIEL PEACO: From -- from Table

1 1?

2 MS. PATTI RAMAGE: That's right.

3 MR. DANIEL PEACO: Yeah. The

4 discussion we had before on Table 1.

5 MS. PATTI RAMAGE: Okay. Yes. Moving
6 to Tab 6 of the book of the documents, in the La Capra
7 report -- and here I'm referencing -- it's page 8 in
8 the book of documents, Tab 6 -- La Capra --

9 MR. DANIEL PEACO: I'm sorry, page --

10 MS. PATTI RAMAGE: Page 8 in Tab 6.

11 MR. DANIEL PEACO: I don't have a page
12 8.

13 MS. PATTI RAMAGE: Page number's on the
14 bottom right-hand corner. It's La Capra's page --

15 MR. DANIEL PEACO: Okay.

16 MS. PATTI RAMAGE: -- 1-57.

17 MR. DANIEL PEACO: Okay.

18 MS. PATTI RAMAGE: La Capra states here
19 that -- and I'm not going to quote directly, but,
20 Manitoba Hydro's energy criterion has some unique and
21 limiting features which restrict resource planning
22 options.

23 And I want to explore that comment,
24 because we've already established BC Hydro projects to
25 limit its reliance on non-firm energy -- non-firm

1 market energy to 4,100 gigawatt hours per year.

2 And I am assuming you're familiar with
3 hydro resources in the pacific northwest that you
4 referenced in your report earlier, and would you agree
5 that that region supplies 56 percent of its electricity
6 -- or I'm going to start over.

7 Would you agree that in the Pacific
8 Northwest, 56 percent of the region's electricity
9 generating capacity is supplied by hydro?

10 MR. DANIEL PEACO: I'll accept your
11 representation.

12 MS. PATTI RAMAGE: And according to the
13 2012 Columbia River Basin Annual Report, which is
14 referenced in Manitoba Hydro's rebuttal evidence, the
15 Pacific Northwest region has a winter peak load of
16 approximately 32,000 megawatts.

17 Would you accept that, subject to check?

18 MR. DANIEL PEACO: I take your
19 representation.

20 MS. PATTI RAMAGE: And the Pacific
21 Northwest region is connected to California, which is a
22 summer peaking region.

23 Is that correct?

24 MR. DANIEL PEACO: Yes, it is.

25 MS. PATTI RAMAGE: And if I could have

1 you turn to Tab 11 of the book of documents. That's
2 page 28.

3

4 (BRIEF PAUSE)

5

6 MS. PATTI RAMAGE: This is a
7 presentation from the Resource Adequacy Advisory
8 Committee of the Pacific Power and Conservation Council
9 Steering Committee, dated December 6, 2013. And I'm
10 looking at the top slide on the page. It's headed,
11 "Modified RA assessment."

12 Are you there?

13 MR. DANIEL PEACO: I am.

14 MS. PATTI RAMAGE: And if I could look
15 -- have you look at the bottom of the slide underneath
16 the graphical depiction, it says -- do you see where it
17 says, "Summer on-peak zero megawatts; off-peak 3,000
18 megawatts"?

19 MR. DANIEL PEACO: I see that.

20 MS. PATTI RAMAGE: And do you see in
21 the column circled in red that transfer capability is
22 up to 5,000 megawatts in some months?

23

24 (BRIEF PAUSE)

25

1 MS. PATTI RAMAGE: It's the column to
2 the right of the one circled in red. I'm sorry.

3

4 (BRIEF PAUSE)

5

6 MR. DANIEL PEACO: I'm sorry. I -- I
7 was looking at the wrong place. Your question again?

8 MS. PATTI RAMAGE: Was -- in the
9 column to the right of the column circled in red under
10 'average', do you see that transfer capability is up to
11 5,000 megawatts in some months?

12 MR. DANIEL PEACO: I see the number,
13 yeah.

14 MS. PATTI RAMAGE: And you would agree
15 that that means that in a manner similar to what
16 Manitoba Hydro's assumed, the Pacific Northwest region
17 considers no on-peak summer imports and up to 3,000
18 megawatts in the off-peak period, which is not 100
19 percent of their transfer capability?

20

21 (BRIEF PAUSE)

22

23 MR. CHRISTIAN MONNIN: Sorry, Ms.
24 Ramage, the Steering Committee meeting dated December
25 6th, 2013, you know, this -- this is -- this is my

1 first rodeo, as they say.

2 Who are these people and where -- what -
3 - where was this presentation?

4 MS. PATTI RAMAGE: These are the people
5 who your client referenced in their report on page 1-8
6 as being comparable to Manitoba Hydro. And this is --
7 when Manitoba Hydro followed up on that to see how the
8 comparison worked, this is the information that was in
9 our rebuttal evidence, and I'm just walking through it.

10 MR. CHRISTIAN MONNIN: Okay. And the
11 slide that you're referring to, this one here on the
12 screen, which is on page 28, seems to be analyses, but
13 do you have any backup data for this, or just the
14 slides? This is all you have?

15 MS. PATTI RAMAGE: I -- I'm not sure
16 this is the time for us to be responding to Information
17 Requests. This information was filed in our rebuttal
18 evidence as -- to deal with the evidence of La Capra.
19 So I'll -- I'll --

20 MR. CHRISTIAN MONNIN: And I don't
21 think I'm treading over there. I'm just -- this is the
22 first time that we've seen this particular document.
23 And I'm just inquiring of the nature of it.

24 MS. PATTI RAMAGE: Yeah, I -- I don't
25 have anything with me. It shouldn't be the -- it -- it

1 was referenced in the rebuttal evidence.

2 MR. CHRISTIAN MONNIN: Okay. Could --
3 maybe we can do that offline, but perhaps you can show
4 me where it's referenced in your rebuttal evidence,
5 because this is the first time this document has been
6 seen.

7

8 (BRIEF PAUSE)

9

10 MS. PATTI RAMAGE: It is referenced in
11 Manitoba Hydro's rebuttal evidence on page 51. And the
12 reference to the Pacific Northwest region is referenced
13 in the La Capra report on page 1-8.

14

15 (BRIEF PAUSE)

16

17 MR. CHRISTIAN MONNIN: So are you
18 referring to -- would that be Footnote 23?

19

20 (BRIEF PAUSE)

21

22 MS. PATTI RAMAGE: Yes.

23 MR. CHRISTIAN MONNIN: And so there's a
24 typo. It -- it's -- that's referring to November 20th
25 and this is December 6th, 2013. The -- the slide deck

1 that you have is December 6th, 2013, and the footnote
2 refers to November 20th, 2013.

3 MS. PATTI RAMAGE: I'm advised by Mr.
4 Hunter that it is the same document. It's a -- if --
5 if there's a difference, it's a typo.

6 MR. CHRISTIAN MONNIN: Thank you.

7

8 (BRIEF PAUSE)

9

10 MS. PATTI RAMAGE: And hopefully maybe
11 to move things along --

12 MR. CHRISTIAN MONNIN: Mr. Peaco has
13 one (1) further point on that. And I believe it's page
14 1-8 of their report. Mr. Peaco, if you want, you --

15 MR. DANIEL PEACO: No, that's fine. I
16 -- I was just -- you called my attention to 1 -- 1-8.
17 And I see that we -- we indicate that BC Hydro was in
18 the Pacific Northwest. Is that the reference you were
19 talking about?

20

21 CONTINUED BY MS. PATTI RAMAGE:

22 MS. PATTI RAMAGE: Yes.

23 MR. DANIEL PEACO: All right. So you
24 weren't pointing to a specific document that we
25 referred to?

1 MS. PATTI RAMAGE: No, I'm not. It was
2 just the -- the general comparison between the regions
3 --

4 MR. DANIEL PEACO: All right. I wasn't
5 understanding the --

6 MS. PATTI RAMAGE: -- we were following
7 up on.

8 MR. DANIEL PEACO: -- the connection to
9 what you were referring to. I don't have enough on
10 this -- I haven't seen this document and I don't have
11 enough on this page to know what it's doing.

12 MS. PATTI RAMAGE: You can confirm you
13 were provided with a copy of Manitoba Hydro's rebuttal
14 evidence, correct?

15 MR. DANIEL PEACO: Yes.

16 MS. PATTI RAMAGE: And that rebuttal
17 evidence also provided examples of some sort of
18 limitation on the consideration of external supply as a
19 resource in the cases of Ontario Hydro, Hydro-Quebec,
20 and the Maritimes region. And in the interest of time
21 I'm hoping not to have to walk through each one.

22 But would you agree that these examples
23 are not fundamentally different than the BC Hydro or
24 pacific northwest examples we've walked through and
25 that limitations of this type are not unique?

1 MR. DANIEL PEACO: Yeah, and I think
2 we've established -- we stated that in our report.

3

4 (BRIEF PAUSE)

5

6 MS. PATTI RAMAGE: If you could go to
7 Tab 6 of the report. And that is page 8. The tab --
8 I'm sorry, Tab 6 of the book of documents, which
9 reproduces page 1-57 of your report. And I'm reading
10 from the -- the third paragraph under the letter 'A':

11 "Manitoba Hydro's energy criteria
12 conversely has some unique and
13 limiting features which restrict the
14 resource planning options."

15 And so I am suggesting to you, sir, that
16 Manitoba Hydro's energy criterion, based on the review
17 of the utilities we have just done, of hydro utilities,
18 is not unique?

19 I will agree it is limiting, because
20 that's the intent of a criterion, but it is not unique?

21 MR. DANIEL PEACO: Right, but we -- you
22 also read eloquently from one (1) of my other -- other
23 reports that we stated that your criteria was similar
24 to these other systems that you just talked about. So
25 the -- the statement here is not a statement specific

1 to those. It's unique relative to the broader
2 industry.

3

4 (BRIEF PAUSE)

5

6 MS. PATTI RAMAGE: Okay. And I think
7 where our disagreement then comes -- because if I
8 continue reading in that paragraph, what La Capra has
9 indicated:

10 "There is a lack of analytical
11 support for limitations of the criterion
12 -- limitations the criterion places
13 on dependable energy from imports,
14 and overall the criterion does not
15 fully consider the modern system with
16 high transfer capability with -- with
17 Manitoba Hydro's neighbours."

18 And I took from that that the -- the
19 unique feature was the -- the limitations that are
20 placed with the energy criterion.

21 Was I mistaken?

22 MR. DANIEL PEACO: You're not mistaken,
23 but I guess the question is you made the assumption
24 that that was -- that was referring simply to the
25 universe of other hydro systems.

1 MS. PATTI RAMAGE: Help me by
2 explaining what is unique about Manitoba Hydro's energy
3 criterion.

4 MR. DANIEL PEACO: What's unique about
5 it? It's -- a hydro system has -- has different
6 criterion than other systems would.

7 MS. PATTI RAMAGE: So it's not unique
8 among hydro systems; it is unique as compared to a --

9 MR. DANIEL PEACO: Yeah, as I said
10 before --

11 MS. PATTI RAMAGE: -- a thermal system,
12 is that what you mean?

13 MR. DANIEL PEACO: -- that statement is
14 in our report, and you read it.

15 MS. PATTI RAMAGE: If you could clarify
16 for me. Is it -- you're saying it's not unique amongst
17 hydro systems but hydro systems are unique as compared
18 to, for example, a thermal system.

19 MR. DANIEL PEACO: Right.

20 MS. PATTI RAMAGE: Is that what you
21 mean?

22 MR. DANIEL PEACO: Exactly.

23 MS. PATTI RAMAGE: Now, if I could have
24 you turn back to Tab 1, and that's page 1. And I want
25 to move to the capacity criterion for a moment.

1 And can you confirm that Manitoba
2 Hydro's capacity criterion includes a minimum reserve
3 against breakdown of plant and increases in demand
4 above forecast?

5 MR. DANIEL PEACO: Yes.

6 MS. PATTI RAMAGE: And you'd also agree
7 that the energy criterion -- that's the energy
8 criterion does not include any reference to a minimum
9 reserve against breakdown of plant or increase in
10 demand above forecast.

11 Is that correct?

12

13 (BRIEF PAUSE)

14

15 MR. DANIEL PEACO: Could you state the
16 question again?

17 MS. PATTI RAMAGE: You'd acknowledge
18 that Manitoba Hydro's energy criterion does not include
19 any reference to a minimum reserve against breakdown of
20 plant or increase in energy demand above forecast?

21 MR. DANIEL PEACO: Well, it builds in
22 reserves by -- by tying to dependable energy. It isn't
23 initially tied to breakdowns, but the unavailability
24 due to water supply. And it does not say anything
25 about load forecast, it just says it shall -- shall

1 supply firm energy demand.

2 MS. PATTI RAMAGE: So, no, it does not
3 con -- does not include any reference to minimum
4 reserves against breakdown or -- of plant or increase
5 in energy demand above forecast, correct?

6 MR. DANIEL PEACO: Apart from water
7 shortage.

8 MS. PATTI RAMAGE: If I could have you
9 go to Tab 10 then, that's page 26 in the book of
10 documents. And this is an excerpt from Manitoba
11 Hydro's 2012 electric load forecast. It's page 57 from
12 that forecast.

13 Do you see where it is stated -- and I'm
14 talking, it's the fifth paragraph down, middle of the
15 page.

16 MR. DANIEL PEACO: I'm sorry, what
17 page?

18 MS. PATTI RAMAGE: We're on page 57 in
19 Tab 10.

20 MR. DANIEL PEACO: Okay.

21 MS. PATTI RAMAGE: It's -- it's page 57
22 of the forecast, 26 of the book of documents. And I'm
23 looking -- it's the fifth paragraph down, middle of the
24 page.

25 Do you see where it's stated that

1 Manitoba -- that the Manitoba Hydro load forecast is
2 prepared assuming normal weather?

3 MR. DANIEL PEACO: I see that.

4 MS. PATTI RAMAGE: And if you turn the
5 page back to page 44 of the -- from the load forecast,
6 which is page 25 in the book of documents, do you see
7 the statement at the top of the page that says:

8 "A record cold winter will increase
9 load 4 percent, and a record warm
10 winter will decrease it 3 percent.
11 An additional 2 percent load increase
12 is possible due to a record hot
13 summer, and a 1 percent decrease is
14 due to a record cool summer."

15 Do you see that on the page?

16 MR. DANIEL PEACO: I see that
17 statement, yes.

18 MS. PATTI RAMAGE: Yes. And would you
19 agree that extremely long and cold winters are possible
20 in Manitoba?

21 MR. DANIEL PEACO: I've never heard of
22 that.

23 MS. PATTI RAMAGE: I was trying to see
24 if I could say it with a straight face. And still on
25 page 44 of the load forecast, if we look at the table

1 on the page, we see the effect of weather due to winter
2 extremes on gross firm energy.

3 And it's the -- and here we're looking
4 at the -- the difference between the twenty-five
5 thousand eight hundred eighty-two (25,882) of record
6 cold.

7 Do you see that on the right-hand side?

8 MR. DANIEL PEACO: I'm sorry, where --
9 what --

10 MS. PATTI RAMAGE: I -- I'm in the box
11 on the right-hand side, top box --

12 MR. DANIEL PEACO: Okay.

13 MS. PATTI RAMAGE: -- under "Effective
14 weather due to winter extremes." And it says, "Record
15 cold," and then in gigawatt hours, it indicates 25,882
16 gigawatt hours for a record cold.

17 MR. DANIEL PEACO: I see that.

18 MS. PATTI RAMAGE: Yeah. And do you
19 see under, "Record warm," it indicates 24,120 gigawatt
20 hours? And would you agree that's a difference
21 of 921 gigawatt hours?

22 MR. DANIEL PEACO: Is that -- are we
23 doing the math, or is that on the table here somewhere?

24 MS. PATTI RAMAGE: It's not on the
25 table. We're doing the math. The difference between

1 our record cold and our record warm is nine hundred and
2 twenty (920) --

3 MR. DANIEL PEACO: Am I -- are we
4 looking at the twenty-five eight eight two (25,882) and
5 the twenty-five four eight nine (25,489)?

6 MS. PATTI RAMAGE: You know what, I've
7 just been corrected. I am working from normal, not
8 record warm. So the difference between a normal winter
9 and a record cold winter is -- that is the 921 gigawatt
10 hours. That would be why you can't work my math.

11 MR. DANIEL PEACO: Okay. So -- so the
12 two (2) numbers we're comparing are -- the -- the
13 record cold I have at twenty-five (25) --

14 MS. PATTI RAMAGE: -- thousand eight
15 hundred and eighty two (882) and the normal on the
16 left-hand side of the box.

17 MR. DANIEL PEACO: Twenty-four nine
18 sixty-one (24,961)?

19 MS. PATTI RAMAGE: And that difference,
20 which represents the difference between normal and
21 extreme cold, is 921 gigawatt hours.

22 And do you agree with that?

23 MR. DANIEL PEACO: Yeah, that looks --
24 yeah. I can -- I can imagine that that's close to the
25 answer in that -- on that one.

1 MS. PATTI RAMAGE: You can only
2 imagine, right?

3 MR. DANIEL PEACO: I've learned never
4 to do math on the stand.

5 MS. PATTI RAMAGE: You're familiar with
6 the fact that Manitoba Hydro maintains two (2) CTs in
7 Brandon, and they provide 2,354 gigawatt hours of
8 dependable energy, or 1,177 gigawatt hours per unit?

9 Does that sound right, the --

10 MR. DANIEL PEACO: But is that on the
11 page here or something?

12 MS. PATTI RAMAGE: No, it's not on the
13 page. I'm -- I'm jumping to just a comparison of what
14 that means. So I can take you there if you'd like to --

15 MR. DANIEL PEACO: No.

16 MS. PATTI RAMAGE: -- see that for
17 confirmation.

18 MR. DANIEL PEACO: I --

19 MS. PATTI RAMAGE: Will you accept,
20 subject to tec -- check -- that the Brandon turbines
21 each are 1,177 gigawatt hours per unit?

22 MR. DANIEL PEACO: As long as I don't
23 have to do a math operation on the number over here.

24 MS. PATTI RAMAGE: Oh, okay. And we
25 all know that generating units fail from time to time,

1 and that the failure rate is -- it's known as a forced
2 outage rate, and for thermal units, that rate can be in
3 the range of 5 to 10 percent, or even higher,
4 potentially.

5 Would you agree with that?

6 MR. DANIEL PEACO: I accept that.

7 MS. PATTI RAMAGE: And so, on a normal
8 basis, one might expect outages in the 5 to 10 percent
9 range, but it's also possible that we could have
10 catastrophic outages, the outages like the one at
11 Sherco in Minnesota, which put their CT out for -- I
12 think it was twenty-two (22) months.

13 Those sort of things do happen, correct?

14 MR. DANIEL PEACO: Correct.

15 MS. PATTI RAMAGE: Yeah, the -- their
16 coal plant. Sorry, I -- and should such a catastrophic
17 outage occur in Brandon, it would result in the loss of
18 1,177 gigawatt hours per year of dependable energy to
19 Manitoba Hydro.

20 Is that correct?

21 MR. DANIEL PEACO: I'll take your
22 representation.

23 MS. PATTI RAMAGE: Yeah. So would you
24 agree, then, that energy contingency events such as
25 extreme winter or an extended outage of a thermal unit

1 or, you know, a drought worse than the drought of
2 record can occur, and none of those events are
3 explicitly considered in Manitoba Hydro's energy
4 criterion?

5 MR. DANIEL PEACO: I didn't -- it
6 doesn't -- the criterion doesn't articulate that, no.

7 MS. PATTI RAMAGE: And next I want to
8 move on to talking about the No New Generation Plan.
9 And if I understood your exchange with Dr. Bel
10 yesterday, I concluded that the No New Generation
11 concept was effectively an opportunity to test Manitoba
12 Hydro's planning criteria, as well as the value of
13 imports.

14 Is that fair?

15 MR. DANIEL PEACO: Yes.

16 MS. PATTI RAMAGE: And it's not a plan,
17 per se, that you would suggest has been developed to,
18 for example, compete with the Preferred Development
19 Plan at this time?

20 MR. DANIEL PEACO: It was a scenario we
21 analyzed to test the economics of certain combinations
22 of options that were in our -- in our scope of work.

23 MS. PATTI RAMAGE: But it's not -- it's
24 -- you're not putting up -- it up as a -- as a
25 competitor to the Preferred Development Plan, are you?

1 MR. DANIEL PEACO: As a plan, per se?

2 No. I mean, it's -- it's an economic study at this
3 point, but it points to some things that may -- may
4 well ultimately warrant being considered in a plan.

5 MS. PATTI RAMAGE: And -- and that
6 concept is then -- as I understand it, it's premised on
7 three (3) things: it's lower net load achieved through
8 DSM and fuel switching savings, the construction of a
9 750 megawatt import line in service in 2029, and it's
10 relaxing Manitoba Hydro's planning criteria to allow
11 for imports up to 20 percent.

12 Is that correct?

13 MR. DANIEL PEACO: Yes. Oh, I'm sorry.

14 MS. PATTI RAMAGE: It's -- it's
15 premised on lower net load achieved through DSM and
16 fuel switching savings first. Second, the construction
17 of a 750 megawatt import line in service in 2029. And
18 third, relaxing Manitoba Hydro's planning criteria to
19 allow for imports up to 20 percent of Manitoba Load.

20 Is --

21 MR. DANIEL PEACO: That's correct.

22 MS. PATTI RAMAGE: Do I have the three
23 (3) key components?

24 MR. DANIEL PEACO: That's correct.

25 MS. PATTI RAMAGE: Now, you indicated

1 during Monday's presentation that your analysis assumes
2 DSM at a 150 percent of reference case assumptions,
3 which you indicated is far less than Manitoba Hydro's
4 Level 2 DSM, which is four (4) times the reference case
5 assumption.

6 Is -- do I recall that correctly?

7 MR. DANIEL PEACO: Yes.

8 MS. PATTI RAMAGE: And you treat fuel
9 switching as separately from DSM. Is that correct?

10 MR. DANIEL PEACO: Well, not -- I mean,
11 the discussion we had to put that case together, we --
12 we specifically wanted to look at -- at a fuel
13 switching component to the -- to the plan. And so that
14 was the discussion. And -- and it is a form of DSM,
15 but specifically one that -- one that we wanted to
16 understand be -- the impacts of.

17 MS. PATTI RAMAGE: But when you
18 referred to the 150 percent, did that include fuel
19 switching?

20 MR. DANIEL PEACO: My understanding,
21 the way it was represented to us, is that the
22 assumptions would be put together using 150 percent of
23 DSM plus a fuel switching program.

24 MR. JOHN ATHAS: Just to make some --
25 just to make sure, the -- the label of 150 percent is

1 something that we are using for Manitoba Hydro. I
2 mean, La Capra Associates didn't do any analysis to say
3 whether that -- whether that's an approximate, whether
4 that's -- whatever that is.

5 The scenario that you -- that was
6 postulated and tested within the NFAT is a hundred --
7 is called the one point five (1.5) times base level
8 DSM, which is embedded in the load forecast. So some
9 of the questions sounded like we derived the label.

10 MS. PATTI RAMAGE: The purpose of my
11 question was just to make sure the Board understands
12 that when we're talking about 150 percent we're talking
13 about DSM fuel switching is -- would be in addition to
14 that.

15 And that's correct, correct?

16 MR. DANIEL PEACO: That's correct.

17 MS. PATTI RAMAGE: Now, with respect to
18 the 750 megawatt import line, would I be correct in
19 saying that the primary driver for the need for this
20 line would be additional firm energy supply from
21 external regions into Manitoba?

22 MR. DANIEL PEACO: Yes.

23 MS. PATTI RAMAGE: And in response to
24 the Information Request Manitoba Hydro/LCA 7a2, it's at
25 Tab 15, if the parties wish to turn there. I don't

1 think it's necessary, but it looks like everyone will.

2 In that response, La Capra indicated
3 that it expected that new transmission built to the US
4 to accommodate imports to Manitoba would require
5 permitting approval, but LCA has no basis to conclude
6 that this is a major impediment to pursuing such
7 transmission.

8 Do you recall that response?

9 MR. DANIEL PEACO: Yes.

10 MS. PATTI RAMAGE: And based on
11 Monday's evidence, I take it that you're prepared to
12 accept that an import line from Minnesota is not
13 feasible.

14 Would -- would that be correct?

15 MR. DANIEL PEACO: Could you refresh me
16 what specifically you're referring to?

17 MS. PATTI RAMAGE: You know what? I
18 don't have the reference right now, so I'll ask the
19 question. Are you prepared to accept that -- that a
20 line from Minnesota -- based on the evidence you've
21 heard in the hearing thus far, in particular the report
22 and testimony of Eric Swanson, are you prepared to
23 accept that an import line from Minnesota is not
24 feasible?

25 MR. DANIEL PEACO: I didn't -- I don't

1 think I testified to the feasibility or the
2 infeasibility of a line from Minnesota. I said that it
3 wasn't necess -- necessarily a condition of the case
4 that we were testing.

5 MS. PATTI RAMAGE: Okay. If we assume
6 -- we accept that you haven't testified to it, having
7 heard the evidence you've heard thus far, would you be
8 prepared to say that a line from Minnesota is feasible?

9 MR. DANIEL PEACO: I don't have any
10 basis to know whether it is or isn't feasible.

11 MS. PATTI RAMAGE: And what I recall
12 you -- again from your evidence, and I don't think I
13 have the transcript rever -- reference here, which I
14 should.

15 But I understood that you said that if
16 you're really of -- of the mind-set to build an import
17 line, you would look for a different point than you
18 would if you were building a transmission line for
19 export.

20 Does -- does that sound like I'm
21 correctly restating the evidence?

22 MR. DANIEL PEACO: Yes, I recall that.

23 MS. PATTI RAMAGE: Yeah. And that
24 would be because you're looking for a region that has
25 surplus when you're importing, correct?

1 MR. DANIEL PEACO: You would -- you
2 would consider the market that you -- that you're --
3 you're tapping into. If you're -- if you were
4 intending to rely on that for imports, then you would
5 want to go to places where that would be the most
6 lucrative opportunity.

7 MS. PATTI RAMAGE: You suggested, I
8 thought -- I thought I heard you suggested that North
9 Dakota might be an option.

10 Is that correct?

11 MR. DANIEL PEACO: Yeah.

12 MS. PATTI RAMAGE: Okay. And are you
13 aware that load in North Dakota is growing due to oil
14 development --

15 MR. DANIEL PEACO: I am.

16 MS. PATTI RAMAGE: -- and the state --
17 yeah. And the state is looking for new resources in --
18 in the order of a thousand (1,000) megawatts of base
19 load?

20 MR. DANIEL PEACO: I'm not familiar
21 with the numbers, but...

22 MS. PATTI RAMAGE: And you haven't
23 retained counsel or otherwise investigated the
24 requirements of a Certificate of Public Convenience
25 from the State of North Dakota.

1 Would that be correct?

2 MR. DANIEL PEACO: That's correct.

3 MS. PATTI RAMAGE: And are you aware of
4 Mr. Swanson's evidence that while the North Dakota
5 statutory and regulatory scheme is somewhat different
6 from Minnesota's, there's -- there would still be an
7 issue of needing to get regulatory approvals for a line
8 that would not be providing native load benefits?

9 Do you recall that -- have you seen that
10 evidence or read it?

11 MR. DANIEL PEACO: It was my
12 understanding Mr. Swanson wasn't in a position to
13 testify about North Dakota.

14 MS. PATTI RAMAGE: Mr. Swanson did, in
15 fact, testify about North Dakota and that was a quote
16 from his evidence

17 So were you aware of it?

18 MR. DANIEL PEACO: The quote again?

19 MS. PATTI RAMAGE: He indicated that
20 North Dakota statutory regulatory scheme is somewhat
21 different from Minnesota. There would still be an
22 issue of needing to get those regulatory approvals for
23 a line that would not be providing native load benefit.

24 And I have to say -- I can pull out the
25 transcript -- that maybe my --

1 MR. DANIEL PEACO: Well --

2 MS. PATTI RAMAGE: -- paraphrase. I
3 haven't put quotes around it in my notes, so.

4 MR. DANIEL PEACO: I -- I recall a
5 statement to that effect, and I don't disagree with
6 that statement.

7 MS. PATTI RAMAGE: And if we look to
8 our neighbours to the west, you're aware that
9 Saskatchewan has signed an MOU with Manitoba Hydro to
10 discuss up to 500 megawatts of new supply?

11 MR. DANIEL PEACO: I'm aware of that.

12 MS. PATTI RAMAGE: So it would appear
13 Saskatchewan is not in a surplus situation?

14 MR. DANIEL PEACO: Is it -- that MOU is
15 -- is the evidence for that?

16 MS. PATTI RAMAGE: I'm suggesting that
17 a -- a province that is -- is looking for 500 megawatts
18 from Manitoba is not likely to be in a surplus
19 situation.

20 MR. DANIEL PEACO: Okay. I'll take
21 your representation on that.

22 MS. PATTI RAMAGE: And our neighbours
23 to the east, Ontario, is a large, sparsely populated
24 area with a proportionally small peak load of 750
25 megawatts, with hydro resources that depend upon the

1 same rivers as Manitoba Hydro, or many of them.

2 And would that likely to be a source of
3 major new supply in the long term for Manitoba Hydro?

4 MR. DANIEL PEACO: I'm not aware that
5 it would be.

6 MS. PATTI RAMAGE: And Ms. Saunders
7 this morning, she's -- was counsel for MMF, she raised
8 the possibility of importing capacity from a number of
9 American markets. One was PJM, and for the record, you
10 can confirm that PJM -- the region is Pennsylvania, New
11 Jersey, and Maryland.

12 Is that correct?

13 MR. DANIEL PEACO: That's what PJM
14 stands for, but their market footprint is bigger than
15 that.

16 MS. PATTI RAMAGE: Okay. Could you
17 confirm there's no firm transmission pathway between
18 Manitoba Hydro and PJM?

19 MR. DANIEL PEACO: That's -- would be
20 my understanding, yes.

21 MS. PATTI RAMAGE: Yeah. The other
22 region that was put to you by Ms. Saunders was SPP, the
23 Southwest Power Pool, and I understand that includes
24 Arkansas, Louisiana, Mississippi, New Mexico, and
25 Oklahoma.

1 Is that correct?

2 MR. DANIEL PEACO: Amongst some other
3 places, yes.

4 MS. PATTI RAMAGE: And can you confirm
5 that there's no firm transmission pathway between
6 Manitoba Hydro and SPP?

7 MR. DANIEL PEACO: Other than as a --
8 as a -- in agreement with MISO. So they're -- it'll be
9 accessed through MISO.

10 MS. PATTI RAMAGE: Thank you.

11 THE CHAIRPERSON: I think it's probably
12 an appropriate time for us to take a break. We've been
13 at it for over an hour and a half. So let's take ten
14 (10) minutes, and resume after that.

15

16 --- Upon recessing at 2:27 p.m.

17 --- Upon resuming at 2:21 p.m.

18

19 THE CHAIRPERSON: I believe everyone's
20 in position. We can resume the proceedings.

21

22 (BRIEF PAUSE)

23

24 MS. PATTI RAMAGE: Mr. Chair, just --
25 Mr. Simonsen spoke to me on the break. In terms of

1 timeframe, I am moving as quickly as I can. I am -- I
2 understand we're ending at 5:00. The suggestion was we
3 wouldn't be back on tomorrow. I am concerned about
4 that, because Ms. Boyd has some important topics to
5 address as well.

6 I can advise the panel that Manitoba
7 Hydro has very little in terms of CSI, so that that
8 time can hopefully be carried over. We do note,
9 however, that Intervenors were provided extended times,
10 and that's created more cross, but we will try to make
11 it up by keeping CSI to a -- an absolute bare minimum,
12 and -- and our view is almost nothing on CSI. I won't
13 say nothing, but very, very little.

14 THE CHAIRPERSON: If it helps, the
15 panel is prepared to sit later than 4:30 tomorrow, but,
16 you know, keep in mind that the paperwork tends to
17 expand to fill the briefcase. So although we're
18 offering more time, I would like to make sure that we
19 don't use it frivolously, so.

20 MS. PATTI RAMAGE: I like to think we
21 never use it frivolously.

22

23 CONTINUED BY MS. PATTI RAMAGE:

24 MS. PATTI RAMAGE: If I could now take
25 you to Tab 18 of the book of documents, and I'm looking

1 at page 47. This is a response to an Information
2 Request. It's Information Request PUB/LCA-20.

3 And in this request, the PUB had noted
4 that La Capra had identified various scenarios where
5 changed assumptions could result in the deferral of
6 Keeyask and Conawapa, and the PUB asked La Capra to
7 prepare a matrix.

8 And this is the matrix you've prepared,
9 correct? It's on the top half of page 47?

10 MR. DANIEL PEACO: I see that.

11 MS. PATTI RAMAGE: The first column
12 identifies the assumption that is being made or changed
13 from Manitoba Hydro's Preferred Development Plan.

14 Is that correct?

15

16 (BRIEF PAUSE)

17

18 MS. PATTI RAMAGE: I'm sorry, it's from
19 no new resources. I was corrected.

20 MR. DANIEL PEACO: I'm sorry, I just
21 wanted to make sure I was familiar with what the
22 response was. So your question again?

23 MS. PATTI RAMAGE: I just wanted to
24 confirm that the first column deals with the -- the
25 changes being made from the Manitoba Hydro baseline.

1 MR. DANIEL PEACO: Yes.

2 MS. PATTI RAMAGE: The second column is
3 the year new capacity will be required in the event of
4 that particular -- or with that particular assumption,
5 and the third column is new dependable energy, the year
6 it will be required under the particular assumption.

7 Is that correct?

8 MR. DANIEL PEACO: Yes.

9 MS. PATTI RAMAGE: And the first row
10 indicates the year of need established by Manitoba
11 Hydro, based on its generation planning criteria and
12 the 2013 reference case assumptions.

13 Is that correct?

14 MR. DANIEL PEACO: That's correct.

15 MS. PATTI RAMAGE: And if we skip a few
16 lines and look down to the diversity contract
17 extension, can you confirm that under the assumptions
18 La Capra made regarding diversity contract extensions,
19 the year of need for winter peak capacity is deferred
20 to 2031/'32?

21 MR. DANIEL PEACO: Yes.

22 MS. PATTI RAMAGE: And under the same
23 line, the year of need for dependable energy is marked
24 as N/A, which I interpret as not applicable.

25 To confirm, does this mean that La Capra

1 believes there is no need for dependable energy under
2 this assumption?

3 Or maybe easier, would I be correct that
4 extending the diversity contract would have no impact
5 on the year that dependable energy is required, such
6 that the year should remain at 2023/'24?

7 MR. DANIEL PEACO: Yeah, I -- I guess
8 my understanding is it -- it had no impact on the -- on
9 the energy year of need.

10 MS. PATTI RAMAGE: So it's 2023/'24,
11 and if I go through each one separately under the
12 capacity side, I'm trying to move along, where we see
13 the notation, "N/A", that means the year of capacity
14 need has not changed, and would remain at 2026/'27.

15 Is that correct?

16 MR. DANIEL PEACO: Yes. Yes, correct.

17 MS. PATTI RAMAGE: And still looking at
18 that table, I'd like to quickly just review with you
19 the assumptions made under, "Relax import limitations."
20 And there, what you're referring to is relaxing the
21 generation planning criteria.

22 Is that correct?

23 MR. DANIEL PEACO: Yes.

24 MS. PATTI RAMAGE: And based on the
25 double asterisk footnote, it's my understanding that

1 -- would it be correct that La Capra has included
2 imports on the existing 700 megawatts of firm
3 transmission service twenty-four (24) hours of every
4 day of each year as dependable energy?

5 MR. DANIEL PEACO: I think it's only
6 the off-peak hours.

7 MS. PATTI RAMAGE: Okay.

8 MR. DANIEL PEACO: All -- all hours,
9 I'm sorry. You're correct.

10 MS. PATTI RAMAGE: And that -- the
11 import limit referred -- or the 10 percent import limit
12 has also been ignored. Is that correct?

13

14 (BRIEF PAUSE)

15

16 MR. DANIEL PEACO: This has no
17 consideration to the limit of -- of 10 percent.

18 MS. PATTI RAMAGE: And on the last line
19 of that chart, it indicates, "Use of average hydro
20 supply." If that was used, the year of energy need
21 would be moved to 2046/'47, and the graph below on the
22 page is intended to illustrate that conclusion.

23 Is that correct?

24 MR. DANIEL PEACO: That's correct.

25 MS. PATTI RAMAGE: Now, on that graph,

1 the grey upward sloping line on the graph, that
2 represents Manitoba Hydro's 2013 net load together with
3 exports.

4 Is that correct?

5 MR. DANIEL PEACO: I'm sorry?

6 MS. PATTI RAMAGE: The grey up -- the
7 grey upward sloping line, it's a solid line, that's the
8 2013 net load together with exports?

9 MR. DANIEL PEACO: Yes.

10 MS. PATTI RAMAGE: And the blue line is
11 the same thing, only it's 2012 load, correct?

12 MR. DANIEL PEACO: Yes.

13 MS. PATTI RAMAGE: The solid maroon
14 line represents available dependable energy, assuming
15 no new generation, correct?

16 MR. DANIEL PEACO: Yes.

17 MS. PATTI RAMAGE: And then the dashed
18 maroon line represents the available supply assuming
19 the average of all flow conditions for hydro resources
20 rather than dependable hydro supply.

21 Is that correct?

22 MR. DANIEL PEACO: Correct.

23 MS. PATTI RAMAGE: And where those
24 supply lines intersect with the load lines, that
25 indicates the year that new supply is required,

1 correct?

2 MR. DANIEL PEACO: Yes.

3 MS. PATTI RAMAGE: So if we assume the
4 2013 load, the grey line, and apply Manitoba Hydro's
5 current generation planning criteria which is based on
6 dependable energy resources to determine the need date,
7 you'd agree that the year of energy need is 2023/'24.

8 Do you see where the lines intersect
9 there?

10 MR. DANIEL PEACO: Yes.

11 MS. PATTI RAMAGE: Okay. And again,
12 assuming the 2013 load but applying average flow
13 conditions for hydro resources, the date of need is the
14 2046/'47 that was identified by La Capra, correct?

15 MR. DANIEL PEACO: Yes.

16 MS. PATTI RAMAGE: Now, if I look at
17 that line, that's the supply with average hydro
18 generation. That would include 3,068 gigawatt hours of
19 imports.

20 Is that correct?

21 MR. DANIEL PEACO: I'm sorry, which
22 line?

23 MS. PATTI RAMAGE: The -- the average -
24 - the supply with average hydro generation?

25

1 (BRIEF PAUSE)

2

3 MR. DANIEL PEACO: We'll have to check
4 that.

5 MS. PATTI RAMAGE: Well, let's -- let
6 me walk through it. So this table is intended to
7 detail Manitoba Hydro's total dependable power
8 resources and total energy demand from 2013/'14 to
9 2030/'31, correct?

10 Oh, I'm sorry. I've jumped ahead. I'm
11 talking about one table and I've -- I've missed taking
12 you there. I'd like you to get to the -- if we could
13 turn back a page to page 44. And this is the --

14 MR. DANIEL PEACO: Just to be -- to be
15 clear --

16 MS. PATTI RAMAGE: Yeah.

17 MR. DANIEL PEACO: -- was that -- was -
18 - the question you were asking me, was it -- was it
19 related to this table or no?

20 MS. PATTI RAMAGE: Yes, it was. I'm
21 going to walk through. I asked you whether the --
22 whether 3,068 gigawatt hours were included in the --
23 the average hydro generation amount in -- in addition
24 to the difference between dependable and average. I --
25 I'm adding that to the question to clarify.

1

2

(BRIEF PAUSE)

3

4

MR. DANIEL PEACO: Why don't you ask
5 your question and we'll find it.

6

MS. PATTI RAMAGE: Yeah, I'm going to
7 try to shortcut it then. Do you recognize that
8 included in the -- now I'm going to change my question
9 to try to shortcut this -- that included in the
10 dependable supply shown of -- of 30,000 gigawatt hours,
11 that's the red line at the bottom, that would include
12 roughly 3,000 gigawatt hours of imports?

13

MR. DANIEL PEACO: That would be a
14 derivation of the dependable energy supply.

15

MS. PATTI RAMAGE: That's correct.

16

MR. DANIEL PEACO: Yes. Okay.

17

MS. PATTI RAMAGE: Okay. And the
18 difference between the dependable line and the average
19 line in a -- in a drought year would also be -- be
20 covered through imports, correct? And that would
21 represent 8,000 gigawatt hours roughly?

22

MR. DANIEL PEACO: The difference
23 between --

24

MS. PATTI RAMAGE: Dependable and
25 average. Your --

1 MR. DANIEL PEACO: Would be covered by
2 imports?

3 MS. PATTI RAMAGE: In a drought year,
4 the -- the red solid line is the -- is -- is drought
5 energy.

6 MR. DANIEL PEACO: Well, that would be
7 a reduction of exports, but it wouldn't be imports
8 because you -- your firm load is served by dependable
9 energy.

10 MS. MARY NEAL: If I may say something
11 about this chart. So the -- the figure up on the
12 screen, I mean, it's simply moving the solid red line
13 to the dashed red line. That's simply adding to the
14 average hydro supply in the dependable energy table.

15 So you have -- instead of using
16 dependable energy, you're just using the average
17 energy. So that moves it up about eight thousand
18 (8,000) and that's all that it is.

19 MS. PATTI RAMAGE: And in a drought
20 year that eight thousand (8,000) would have to be
21 covered by -- through imports, correct?

22 MR. DANIEL PEACO: No.

23 MS. MARY NEAL: That's not what it's
24 saying.

25

1 (BRIEF PAUSE)

2

3 MS. PATTI RAMAGE: Okay. My
4 understanding of this is where you're asking -- or
5 you're -- this is indicating that we're going to use
6 average hydro supply. That's what we are going to plan
7 to, correct? Average hydro supply. And that would be
8 the -- somewhere, I'm going to say, 30 -- 38,500
9 gigawatt hours in 2013/'14.

10 MR. DANIEL PEACO: I -- I see what your
11 question is. So you're saying the dash line were the -
12 - were the criterion then you'd be relying on those
13 imports.

14 MS. PATTI RAMAGE: That's right. And
15 Ms. Flynn points out it's probably easiest if you
16 looked at the dash line at 2046/'47, you're relying on
17 37,500 gigawatt hours to meet average --

18 MR. DANIEL PEACO: That's correct.

19 MS. PATTI RAMAGE: And at the same time
20 the dependable energy flow, which is the amount you
21 will actually receive in a drought is something less
22 than thirty thousand (30,000). That's the red line
23 below that.

24 That's correct?

25 MR. DANIEL PEACO: Yes.

1 MS. PATTI RAMAGE: And so as per our
2 earlier discussion, if we are in a drought and we are
3 actually -- we have changed our planning criteria to
4 use average, we will have to recover the difference
5 between the solid red line and the dotted red line and
6 where we will go for that is in imports. Because we
7 have changed the criteria as it relates to imports,
8 correct?

9 MR. DANIEL PEACO: Definitely, yeah.

10 MS. PATTI RAMAGE: So we would recover
11 8,000 gigawatt hours roughly from imports in this case?

12 MR. DANIEL PEACO: If that were -- if
13 that were the criteria, that's right.

14 MS. PATTI RAMAGE: And what I'm asking
15 you is that then you recognize that in addition to that
16 there are three thousand (3,000) roughly, gigawatt
17 hours included in dependable energy such that we would
18 be recovering a total of 11,000 gigawatt hours in
19 imports.

20 MR. DANIEL PEACO: Okay.

21 THE CHAIRPERSON: So where's the three
22 thousand (3,000) coming from?

23

24 CONTINUED BY MS. PATTI RAMAGE:

25 MS. PATTI RAMAGE: The -- the thousand

1 (3,000) we had established earlier this afternoon that
2 as part of dependable energy and using the curr -- the
3 criteria of Manitoba Hydro presently, Manitoba Hydro
4 can import, under the current limits, 3,000 gigawatt
5 hours within its dependable energy criteria.

6 So with this suggestion of use of
7 average flow, we're now up to 11,000 gigawatt hours of
8 dependable energy in 2046/'47, correct? Shortfall.
9 That will be recovered in imports. Just to make sure
10 the panel's --

11 MR. DANIEL PEACO: Yeah.

12 MS. PATTI RAMAGE: -- with us.

13 MR. DANIEL PEACO: Yeah.

14 MS. PATTI RAMAGE: Okay.

15 MR. DANIEL PEACO: Yeah, we're on the
16 same page.

17 MS. PATTI RAMAGE: Now, if I could get
18 you to go to page 49 in this document, we're still in
19 Tab 18. This is a response La Capra provided to a PUB
20 IR, and it's PUB/LCA-22B. And if we look to the
21 response, my understanding of La Capra's calculation is
22 that here La Capra is confirming that Manitoba Hydro's
23 physical import capability on its existing firm
24 interconnection is 6,443 gigawatt hours.

25 Is that correct?

1 MR. DANIEL PEACO: Yes.

2 MS. PATTI RAMAGE: And if we turn back
3 to page 2047, I should say, we'd establish that the
4 supply with average hydro generation line is based on
5 the assumption that during the critical drought period
6 Hydro needs a total of 11,000 gigawatt hours in order
7 to achieve average energy production.

8 MR. DANIEL PEACO: Yes.

9 MS. PATTI RAMAGE: So if Hydro's
10 physical import capability on its existing firm
11 interconnection is only 6,443 gigawatt hours per year
12 but it needs to rely on 11,000 gigawatt hours of firm
13 imports during a critical drought, would you agree it's
14 simply not feasible in these circumstances? And in
15 fact it would be reckless for a resource planner to
16 plan to a 2046/'47 energy need date?

17 MR. DANIEL PEACO: Yes.

18

19 (BRIEF PAUSE)

20

21 MS. PATTI RAMAGE: And would you agree
22 then that the year of energy need date would be much
23 earlier than 2046/'47 in -- in this circumstance?

24 It be would whenever it hit the 6,000
25 gigawatt hours?

1 MR. DANIEL PEACO: Yeah, you would have
2 to have expanded import capability in order to even
3 contemplate something of that nature.

4 MS. PATTI RAMAGE: So that -- that
5 number at the bottom of that chart is incorrect?

6 MR. DANIEL PEACO: Which number are you
7 referring?

8 MS. PATTI RAMAGE: Twenty-four -- the
9 year of 2046/'47 is incorrect. The year of energy need
10 would be much earlier than that?

11 MR. DANIEL PEACO: With -- with the
12 existing transmission system, yes.

13 MS. PATTI RAMAGE: And to confirm, all
14 of the numbers on this table are based on the existing
15 transmission system, correct?

16 MR. DANIEL PEACO: Yes, I believe
17 that's correct.

18 MS. PATTI RAMAGE: If we can now turn
19 to Tab 19 of the book of documents. Here we have slide
20 35 from your presentation yesterday on the next page.
21 There's also a page contained in -- it's page 26
22 through 28 of your report.

23 And it describes La Cap -- La Capra
24 describes Manitoba Hydro's assumptions on wind
25 projects?

1 MR. DANIEL PEACO: Yes.

2 MS. PATTI RAMAGE: And on each of these
3 pages -- I think it's a bit of overkill maybe on our
4 part to have included them all -- La Capra has
5 identified Manitoba Hydro's wind capital cost as being
6 twenty-four hundred dollars (\$2,400) per kilowatt.

7 Is that correct?

8 MR. DANIEL PEACO: Which pages are you
9 referring to?

10 MS. PATTI RAMAGE: Well, page 50, which
11 is page -- slide 35 of yours. You'll see that --

12 MR. DANIEL PEACO: You said each of
13 these pages. And I was just --

14 MS. PATTI RAMAGE: Oh, I'm sorry. I'm
15 saying your capital costs on page 50 are -- Manitoba
16 Hydro's capital costs are referred to as twenty-four
17 hundred dollars (\$2,400) on page 50 of the book of
18 documents, and again on page 51 of the book of
19 documents, which is Appendix 3, page 26, of the La
20 Capra report.

21 MR. DANIEL PEACO: Yes.

22 MS. PATTI RAMAGE: It's, again, twenty-
23 four hundred dollars (\$2,400) on that page?

24 MR. DANIEL PEACO: I see that.

25 MS. PATTI RAMAGE: You see that?

1 MR. DANIEL PEACO: Yes.

2 MS. PATTI RAMAGE: Now, if we -- while
3 you're there -- or if you turn to page 52, which is
4 Manitoba Hydro's response to GAC/Manitoba Hydro First
5 Round 1c, Manitoba Hydro confirms that the twenty-four
6 hundred dollars (\$2,400) per kilowatt is not correct
7 and the updated number is twenty-one hundred dollars
8 (\$2,100) per kilowatt.

9 Do you see that?

10

11 (BRIEF PAUSE)

12

13 MR. DANIEL PEACO: I don't.

14 MS. PATTI RAMAGE: If you see on page
15 52, at the bottom there's three (3) bullets with three
16 (3) -- at each one there's a reference case of twenty-
17 one hundred dollars (\$2,100) indicated.

18 Do you see that?

19 MR. DANIEL PEACO: I guess I don't see
20 the language about the correction.

21

22 (BRIEF PAUSE)

23

24 MS. PATTI RAMAGE: If you read actually
25 in the response as identified in Manitoba Hydro's

1 letter to the Public Utilities Board on September 13th,
2 2013, and posted on Manitoba Hydro's external website,
3 and then it goes on, and that correction was made in --
4 in that correspondence and confirms that that is the
5 correct, do you see, and that the reference case is in
6 fact twenty-one hundred dollars (\$2,100) per kilowatt?

7 MR. DANIEL PEACO: Okay. And this is
8 referring to the levelized cost analysis?

9

10 (BRIEF PAUSE)

11

12 MS. PATTI RAMAGE: Mr. Miles updated --
13 advises me that this what gave the updated economics
14 and that this is what the capital cost was of wind.

15 MR. DANIEL PEACO: Well, my question
16 was, if -- if you're talking about the -- the response
17 seems to be referring to the levelized cost analysis
18 from the screening as opposed to the economic analysis
19 of the case.

20

21 (BRIEF PAUSE)

22

23 MS. PATTI RAMAGE: I'm going to try to
24 move things along faster. Is it your understanding
25 that the economic analysis is based on the figure

1 twenty-two hundred dollars (\$2,200) per kilowatt for
2 the capital cost of wind?

3 MR. DANIEL PEACO: I would have to
4 check, but my recollection is that the numbers were
5 different in the two (2) analysis and I'd -- I would
6 have to check those.

7 MS. PATTI RAMAGE: Would you accept the
8 twenty-two hundred dollars (\$2,200) subject to -- per
9 kilowatt an hour, or an hour, per kilowatt for the
10 capital cost of wind --

11 MR. DANIEL PEACO: I guess I --

12 MS. PATTI RAMAGE: -- subject to check?

13 MR. DANIEL PEACO: -- I wouldn't,
14 because I -- my recollection is the person in our shop
15 that worked on this found mismatches in the analysis,
16 and so we ended up using twenty-four (24). And my --
17 and my belief, but I don't have the verification was
18 that was what was in the economic analysis that we were
19 comparing to. I'd have to check that.

20 So I guess I'm not willing to stipulate
21 to your representation just yet.

22 MS. PATTI RAMAGE: And the difference
23 between the twenty-four hundred dollars (\$2,400) you're
24 speaking of and the twenty-two hundred dollars (\$2,200)
25 I'm speaking of is major transmission.

1 Is that correct?

2 MR. DANIEL PEACO: That may be.

3 Because the number we have is -- includes transmission,
4 so we -- my understanding is in -- the number we have
5 here is what we understand that the costs were with
6 transmission in the analy -- economic analysis.

7

8 (BRIEF PAUSE)

9

10 THE CHAIRPERSON: Mr. Peaco, even with
11 a relatively optimistic scenario that you have
12 described here of lower cost, higher life -- lifetime,
13 and so on, you're still showing that a -- a preferred
14 case is better than the Wind/Gas scenario.

15 Is that -- that's the inference I can
16 draw from that -- from the graph there?

17 MR. DANIEL PEACO: Yeah, that -- yes,
18 and that's based upon --

19 THE CHAIRPERSON: It's -- I mean, after
20 all these adjustments it's still -- the Wind/Gas
21 scenario is still less economic than the Preferred
22 Plan?

23 MR. DANIEL PEACO: Yeah, on -- on 2012
24 assumptions. That's correct.

25

1 (BRIEF PAUSE)

2

3 CONTINUED BY MS. PATTI RAMAGE:

4 MS. PATTI RAMAGE: Mr. Peaco, La Capra
5 has used the figure of seventeen hundred and fifty
6 dollars (\$1,750) per kilowatt for its capital cost of
7 wind.

8 Is that correct?

9 MR. DANIEL PEACO: Yes.

10 MS. PATTI RAMAGE: And that includes
11 interconnection costs, correct?

12 MR. DANIEL PEACO: Yes.

13 MS. PATTI RAMAGE: It does not include
14 transmission costs, correct?

15 MR. DANIEL PEACO: You mean --

16 MS. PATTI RAMAGE: Of major
17 transmissions?

18 MR. DANIEL PEACO: Just some
19 reenforcements?

20 MS. PATTI RAMAGE: Yes.

21 MR. DANIEL PEACO: No.

22 MS. PATTI RAMAGE: And Manitoba Hydro's
23 figure of twenty-four hundred dollars (\$2,400) that
24 you're referring to in -- included that major
25 transmission, correct?

1 MR. DANIEL PEACO: It wasn't clear
2 exactly what that did include.

3 MS. PATTI RAMAGE: Okay. If I could
4 have you to move to what I think is -- well, to page
5 54. And in this IR response, which is Manitoba
6 Hydro/La Capra 14a, La Capra was asked for the source
7 of the seventeen fifty (1,750) per kilowatt. And La
8 Capra answered that the source is the 2012 Wind
9 Technologies Market Report by the US Department of
10 Energy. La Capra attached the ninety-two (92) page
11 report and referred the reader to page 37 of Figure 23.

12 Do you see that response?

13 MR. DANIEL PEACO: Yes.

14 MS. PATTI RAMAGE: Now, portions of
15 that report is -- are included in this tab. And if I
16 could get you to turn to page 56 of the book of
17 documents. And I'm looking in the middle of the
18 paragraph that is in the middle of the page, and it
19 says:

20 "The interior region with both the
21 largest sample and the fewest
22 outliers was the lowest cost region
23 on average, with average costs of
24 \$1,760 per kilowatt."

25 Do you see where I'm reading that --

1 MR. DANIEL PEACO: I do.

2 MS. PATTI RAMAGE: -- on the page?

3 And on the next page, if we turn that
4 page to page 57, I think it's page 57 of our book of
5 documents, page 37 of that report, you will see a
6 figure, it's Figure 24, and it's labelled:

7 "Regional Boundaries Overlayed on a
8 Map of Average Annual Wind Speeds at
9 80 Metres."

10 Can you confirm that this chart, though,
11 identifies boundaries of the regions used in the
12 report?

13 MR. DANIEL PEACO: Yes.

14 MS. PATTI RAMAGE: And do you see the
15 interior region in the centre of Figure 24, and can you
16 confirm that that interior region includes the
17 following 13 States: North Dakota, Minnesota, South
18 Dakota, Iowa, Montana, Wyoming, Colorado, Nebraska,
19 Kansas, Oklahoma, New Mexico, Missouri, and Texas?

20 MR. DANIEL PEACO: Yes.

21 MS. PATTI RAMAGE: And Figure 23 on the
22 top of this page, and that's on the left-hand side,
23 you'll see the interior region is demonstr -- what --
24 what is going on in the interior region is graphically
25 depicted, and it indicates that forty-two (42) projects

1 installed in 2012 are included in the capital cost
2 review for the interior region.

3 MR. DANIEL PEACO: Yes.

4 MS. PATTI RAMAGE: Each one of those
5 little disks represents a -- a cost of those -- the
6 capital costs of those projects. And would you agree
7 the capital costs roughly fall between -- in the range
8 of fifteen hundred dollars (\$1,500) per kilowatt and
9 twenty-four hundred dollars (\$2,400) per kilowatt?

10 MR. DANIEL PEACO: It's below fifteen
11 hundred (1,500), but -- probably more like thirteen
12 (13) to -- to twenty-three (23).

13 MS. PATTI RAMAGE: If I was bargaining
14 with you, I'd say fourteen (14), but we'll move on.

15 MR. DANIEL PEACO: Okay.

16 MS. PATTI RAMAGE: Are you able to
17 identify which specific states in the interior region
18 each of these projects is located in?

19 MR. DANIEL PEACO: From this data, no.

20 MS. PATTI RAMAGE: Do you have the
21 data?

22 MR. DANIEL PEACO: We -- we -- we are
23 familiar with some individual projects.

24 MS. PATTI RAMAGE: But you can't -- you
25 couldn't tie each for -- one (1) of the forty-two (42)?

1 MR. DANIEL PEACO: No.

2

3 (BRIEF PAUSE)

4

5 MS. PATTI RAMAGE: Are you suggesting
6 that the 1,750 kilowatts -- seventeen hundred dollars
7 (\$1,700) -- seventeen hundred dollars (\$1,700) -- seven
8 (7). I'm going to have trouble. Start over. There's
9 too many numbers here.

10 The one thousand seven hundred and fifty
11 dollars (\$1,750) per kilowatt is representative of the
12 current cost of building wind in Manitoba?

13 MR. DANIEL PEACO: It's -- it's the
14 number from this database that's most representative,
15 because there are a number of projects that are in
16 states neighbouring Manitoba, but it's not the Manitoba
17 data.

18 MS. PATTI RAMAGE: It -- for example,
19 it doesn't take into account costs like transportation
20 and duty?

21 MR. DANIEL PEACO: Correct.

22 MS. PATTI RAMAGE: Wouldn't have cold
23 weather packages, likely.

24 MR. DANIEL PEACO: I would imagine
25 projects in North Dakota would be similar to what you

1 would need in Manitoba.

2 MS. PATTI RAMAGE: Now, if I could take
3 you to page 60 of the book of documents? Here we have
4 a map of the United States, and it's described as:

5 "Figure 4: Location of wind power
6 development in the United States."

7 MR. DANIEL PEACO: Yes.

8 MS. PATTI RAMAGE: And for each state,
9 do you see there's two (2) numbers provided? The top
10 number is the cumulative installed wind capacity in the
11 state, and the bottom number is the annual addition in
12 2012.

13 Are you with me?

14 MR. DANIEL PEACO: Yes.

15 MS. PATTI RAMAGE: And would it be fair
16 to recognize that Texas dominated wind additions to the
17 region in 2012 with 1,826 megawatts, and that would be
18 more than seven (7) times the wind additions in North
19 Dakota of 235 megawatts?

20 MR. DANIEL PEACO: Okay.

21 MS. PATTI RAMAGE: Yeah. And if you
22 look back to the -- there's a page on your left-hand
23 side, and you see Figure 31, which compares capacity
24 factors by region.

25 Do you see that?

1 Do you see that?

2 MR. DANIEL PEACO: Yes.

3 MS. PATTI RAMAGE: And here, the
4 interior region is on the right-hand side of the graph,
5 and this compares forty-eight (48) projects.

6 Is that right?

7 MR. DANIEL PEACO: Yes.

8 MS. PATTI RAMAGE: And you'd agree that
9 the majority of wind projects in the interior region
10 had capacity factors that fall somewhere between
11 roughly 30 percent and 50 percent?

12 MR. DANIEL PEACO: Yes.

13 MS. PATTI RAMAGE: And at the bottom of
14 page 58, top of page 59, if I can read -- and you're
15 going back a page -- it indicates that:

16 "Generation-weighted average capacity
17 factors are the highest in the
18 interior region, 37 percent."

19 Do you see that?

20 MR. DANIEL PEACO: I see that.

21 MS. PATTI RAMAGE: And if we're guided
22 by the 2012 report, then 37 percent is a reasonable
23 capacity factor for the interior region, and both
24 Manitoba Hydro and La Capra have used more optimistic
25 outlooks.

1 Is that not correct?

2 MR. DANIEL PEACO: Correct.

3 MS. PATTI RAMAGE: La Capra is
4 suggesting 43 percent?

5 MR. DANIEL PEACO: Yes.

6 MS. PATTI RAMAGE: And Manitoba Hydro
7 is suggesting 40 percent?

8 MR. DANIEL PEACO: Right.

9 MS. PATTI RAMAGE: Versus an average of
10 37 percent. And you haven't done any analysis on the
11 site-specific characteristics in Manitoba, have you?

12 MR. DANIEL PEACO: No, we have not.

13

14 (BRIEF PAUSE)

15

16 MS. PATTI RAMAGE: My last topic, I
17 think -- and I apologize. It's not in the book of
18 documents. We've stuck some pages in -- in the back of
19 the book of documents, and I forgot to identify them
20 specifically. It is La Capra's -- an -- an excerpt
21 from La Capra Appendix 5.

22

23 (BRIEF PAUSE)

24

25 MS. PATTI RAMAGE: Does everybody have

1 this? It's page -- it begins at page 5-14. I don't
2 believe it needs to be marked, because it's already
3 part of the record. I -- we just gave it for -- yeah,
4 it's not part of the bound part, and it's part of the
5 record, so I think we'll just refer to it as if we were
6 pulling up the actual report.

7 And if I could have you turn to page --
8 what's marked as 19 in this -- this section of the La
9 Capra report? I'm -- I'm looking at figure 5-7, and if
10 I understand correctly, this figure is looking to test
11 how the Preferred Development Plan performs relative to
12 the All Gas Plan under a sequen -- sequence of below-
13 average flow years.

14 Is that correct?

15 MR. DANIEL PEACO: Yes.

16 MS. PATTI RAMAGE: And for the purpose
17 of Figure 5-7, you selected a consecutive sequence of
18 flow years beginning in 2007, and then going back to
19 the beginning of the flow record in 2012, so as to
20 create a thirty-four (34) year sequence.

21 Is that correct?

22 MR. DANIEL PEACO: That's correct.

23 MS. PATTI RAMAGE: So the flow record,
24 then, includes all of the very low-flow years through
25 the 1930s and 1940s, correct?

1 MR. DANIEL PEACO: Yes.

2 MS. PATTI RAMAGE: And the blue shading
3 on the graph represents the percent of average water
4 year, and am I correct that the average water year is
5 the average of all flow years in Manitoba Hydro's
6 ninety-nine (99) year flow record?

7 MR. DANIEL PEACO: Yes.

8 MS. PATTI RAMAGE: Yeah. As opposed to
9 -- it's not suggesting it's the average of the thirty-
10 four (34) years. It's the ninety-nine (99) year flow
11 record.

12 MR. DANIEL PEACO: Exactly.

13 MS. PATTI RAMAGE: All right. And the
14 black line lab -- labelled average water year is tied
15 to the axis on the right, and it's flat at 100 percent,
16 so that the blue shading, when it's above that line, it
17 represents above-average water year, and when the blue
18 shading is below, it means it's a below-average water
19 year, correct?

20 MR. DANIEL PEACO: Correct.

21 MS. PATTI RAMAGE: And the red line
22 that's labelled, "Preferred Plan Minus All Gas," refers
23 to the annual net revenue, and it shouldn't be mistaken
24 for a percentage of average water flow year, correct?

25 MR. DANIEL PEACO: Yes. That -- that

1 data goes to the -- the dollar axis on the left.

2 MS. PATTI RAMAGE: And can you confirm,
3 then, that this is the case, what I've just described,
4 for all of the simil -- similar figures in this
5 section? And here I'm referring to Appendix 5-8, 5-10,
6 5-11, 5-13, and 5-14?

7 MR. DANIEL PEACO: Yeah.

8 MS. PATTI RAMAGE: Now, would I be --
9 the -- correct in suggesting that the analysis in this
10 section from pages 5-14 through 5-29 accounts for
11 revenue from opportunity sales only, and does not
12 include the fixed revenues from the sale of dependable
13 energy for each of these plans?

14

15 (BRIEF PAUSE)

16

17 MR. DANIEL PEACO: Yeah, I believe it's
18 -- it's plotting the data that's the output from
19 SPLASH, so it's -- it's tracking the data that's
20 changing from case to case -- or -- or flow year --
21 flow condition to flow condition.

22 MS. PATTI RAMAGE: But that -- but that
23 data would not include the dependable energy, correct -
24 - or, I'm -- I'm sorry, the fixed-end revenue? Ignore
25 what I just said. And that data, therefore, it doesn't

1 -- does not include the revenue from dependable sales?

2 MR. DANIEL PEACO: Yes, because that's
3 outside of the SPLASH. These are just SPLASH results,
4 so it's -- it would be outside of that.

5 MS. PATTI RAMAGE: You would agree that
6 to the extent that the Preferred Plan has incremental
7 revenue from dependable sales, that line would shift
8 upwards if the revenues from dependable sales were
9 included?

10 MR. DANIEL PEACO: That would shift,
11 but -- yes.

12 MS. PATTI RAMAGE: And it would shift
13 upward quite significantly, correct?

14 MR. DANIEL PEACO: Yes, but we we're --
15 yeah. Yeah, if you were to do that calculation, that's
16 what it would show.

17 MS. PATTI RAMAGE: And if we were to
18 look at, for example, Figure 5-8, the same thing would
19 happen. If dependable revenues were also included,
20 that would be a more -- it -- it's a more optimistic
21 flow record, but at the same time, if dependable
22 revenues were included, the line would shift up --

23 MR. DANIEL PEACO: Yes.

24 MS. PATTI RAMAGE: -- right? And
25 similarly, the same for all of the figures in this

1 section, correct?

2 MR. DANIEL PEACO: That's correct.

3 MS. PATTI RAMAGE: And I'm going to
4 quickly do one (1) more quick area, because that went
5 faster than I thought. And just because our friends
6 from climate change came upstairs -- came to watch to
7 hear their topic, I hate to make them miss it, and I
8 just want to quickly ask you.

9 I -- I wanted to confirm, with your
10 conversation with Ms. Van Iderstine the other day, that
11 -- that La Capra is not claiming expertise in the area
12 of modelling quantitavit -- quantitative climate
13 change, or climate change impacts, or hydro climol --
14 climatology or hydrology, correct?

15 MR. DANIEL PEACO: Correct.

16 MS. PATTI RAMAGE: But in your scope of
17 work, you were asked to comment on climate change
18 sensitivity analysis, correct?

19 MR. DANIEL PEACO: Correct.

20 MS. PATTI RAMAGE: And your review of
21 Manitoba Hydro's work on climate change was based on
22 the materials contained in the NFAT filing, the
23 responses that Hydro provided to your IR request, as
24 well as multiple technical presentations and meetings
25 and teleconferences with staff from Manitoba Hydro,

1 correct?

2 MR. DANIEL PEACO: Yes.

3 MS. PATTI RAMAGE: And in your review
4 of the climate change sensitivity analysis, you
5 identified two (2) key limitations, and -- but would
6 you agree that Manitoba Hydro had identified and
7 recognized those limitations during the various
8 discussions and exchanges you had with them?

9 MR. DANIEL PEACO: Yes. Our report is
10 -- is simply identifying those -- those things that
11 Hydro had already identified.

12 MS. PATTI RAMAGE: And just to confirm,
13 you're not aware of any other generation developers
14 similar to Manitoba Hydro who've undertaken more
15 extensive analysis or advanced modelling of climate
16 change impacts in a resource planning application.

17 Is that correct?

18 MR. DANIEL PEACO: Right.

19 MS. PATTI RAMAGE: Mr. Peaco, I
20 appreciate your answers. I'm now off the mic. You get
21 a fresh face.

22 MR. DANIEL PEACO: Unfortunately, your
23 side does not. Maybe you do. Maybe you get John next
24 time.

25 MS. PATTI RAMAGE: I think Ms. Moroz is

1 going to take over for a moment, and then followed by
2 Ms. Boyd. So I'm going to clear out of here very
3 quickly. We'll -- perhaps if we could just have a --
4 literally, a one (1) minute break, I think.

5

6 (BRIEF PAUSE)

7

8 THE CHAIRPERSON: Before you start, I
9 should welcome you to the proceedings. I don't think
10 I've ever seen you before at one (1) of these
11 proceedings, so.

12 MS. JENNIFER MOROZ: Thank you, Mr.
13 Chairman.

14 THE CHAIRPERSON: I just want to make
15 sure I pronounce your name properly.

16 MS. JENNIFER MOROZ: Moroz, M-O-R-O-Z.
17 It means 'frost' in Ukrainian.

18 MS. PATTI RAMAGE: Mr. Moroz -- or, Mr.
19 Moroz, Mr. Chair, if I could just tell the Board, it's
20 Patti Ramage back here, a quick story, Ms. Moroz was
21 supposed to be the regulatory lawyer for Manitoba Hydro
22 twenty (20) years ago, and she was going on mat leave,
23 and there was two (2) files, a PUB file, or this little
24 thing called MISO Map, and we decided MISO Map would be
25 a quick one (1) she could finish off, and I would do

1 regulatory and she would do transmission, and so she
2 hasn't been back for twenty (20) years.

3 MS. JENNIFER MOROZ: So I ask your
4 indulgence given that fact.

5

6 CROSS-EXAMINATION BY MS. JENNIFER MOROZ:

7 MS. JENNIFER MOROZ: We're ready to
8 proceed? Thank you. Well, good afternoon, Mr. Peaco
9 and other members of La Capra.

10 MR. DANIEL PEACO: Good afternoon.

11 MS. JENNIFER MOROZ: I'm hoping to
12 provide some more questions in the nature of short
13 snappers for you, as opposed to Ms. Ramage's questions,
14 hopefully, and I will be -- sorry?

15 MR. DANIEL PEACO: Your predecessors
16 have -- have used that.

17 MS. JENNIFER MOROZ: I am going to be
18 concentrating on just three (3) issues, and they are
19 all based on La Capra's Technical Appendix 8 on
20 transmission, which is Exhibit number 11, which I
21 believe will be coming up on the screen at some point.

22 And the first issue that I wanted to
23 canvass with you was some comments that you had made
24 about the MISO Wind Synergy study, and you deal with
25 that issue starting on page 25 of Appendix 8.

1 Now, the MISO Wind Synergy study, just
2 to do a -- a brief overview, that was a study conducted
3 by MISO and various stakeholders over the course of
4 three (3) years, from 2011 to 2013.

5 Is that correct?

6 MR. DANIEL PEACO: That's my
7 understanding, yes.

8 MS. JENNIFER MOROZ: And one (1) of the
9 purposes of that study, I understand from your report,
10 was to look at the potential advantages or benefits of
11 a new transmission interconnection between an area that
12 operates hydro generation in conjunction with large
13 concentrations of wind.

14 Is that accurate?

15 MR. DANIEL PEACO: That's my
16 understanding, yes.

17 MS. JENNIFER MOROZ: And based on my
18 understanding of that Wind Synergy study, there were
19 three (3) different possible transmission
20 interconnections that were analyzed.

21 Is that correct?

22 MR. DANIEL PEACO: Yes, I believe
23 that's right.

24 MS. JENNIFER MOROZ: And they were all
25 for a 500 kV line?

1 MR. DANIEL PEACO: Yeah.

2 MS. JENNIFER MOROZ: Okay.

3 MR. DANIEL PEACO: I -- I believe so,
4 but I -- I don't have the study memorized for details,
5 but if you want to point me to something I can verify,
6 or I -- I'll accept your representation.

7 MS. JENNIFER MOROZ: Thank you. The
8 options that were studied, then, as I understand it,
9 were an eastern option, and that was essentially
10 running from Manitoba Hydro's Dorsey substation to
11 Minnesota, terminating at the Blackberry station.

12 Is that correct? That was the east
13 option. Perhaps I can point you to, I think it's page
14 29 or 30 of your report, where you start referring to
15 the various options.

16 MR. DANIEL PEACO: Maybe it's twenty-
17 six (26)?

18 MS. JENNIFER MOROZ: Yes, that's
19 probably it.

20

21 (BRIEF PAUSE)

22

23 MR. DANIEL PEACO: Talk about two (2)
24 of them -- two (2) options studied there.

25 MS. JENNIFER MOROZ: Correct. And the

1 east option is the one that I was referring to that
2 runs essentially from Manitoba Hydro's Dorsey
3 substation to Minnesota, terminating at Blackberry.

4 Is that correct?

5 MR. DANIEL PEACO: Yes.

6 MS. JENNIFER MOROZ: And then you have
7 the western option as well. That was, again,
8 originating from Dorsey and terminating in North Dakota
9 at Barnesville Station near Fargo.

10 Is that correct?

11 MR. DANIEL PEACO: Right.

12 MS. JENNIFER MOROZ: And I mention
13 these different nomenclature, because MISO apparently
14 changed how they referenced these studies over the
15 course of three (3) years.

16 And then finally, I don't know if you're
17 familiar that they canvassed a third option, which they
18 referred to as a central option?

19 MR. DANIEL PEACO: I recall that. One
20 (1) -- I think they eventually had three (3), and then
21 they focussed on these two (2) in the study, or
22 something to that effect.

23 MS. JENNIFER MOROZ: Thank you. And
24 would you agree that the east option is essentially the
25 international power line that Manitoba Hydro has

1 proposed in its preferred Development Plan --

2 MR. DANIEL PEACO: Essentially, yes.

3 MS. JENNIFER MOROZ: Thanks.

4 I'd like to refer you, then, to page 8-
5 30 of your report, and at the top of the page, you've
6 drawn an observation or conclusion from the MISO Wind
7 Synergy study. And to quote, it states that:

8 "In addition, the study found that
9 after the new hydro Conowapa and
10 Keeyask is operational, and the new
11 transmission interconnection is
12 completed, the interface flow from
13 Manitoba Hydro to MISO is only
14 increased on average by 358
15 megawatts. This indicates a less
16 than optimal transfer on the Manitoba
17 Hydro to US intertie."

18 And Mr. Peaco, when LCA was asked for
19 the basis for that figure of 358 megawatts, LCA had
20 referenced a MISO presentation that's available on its
21 website with respect to that study.

22 Is that correct?

23 MR. DANIEL PEACO: Is that an IR
24 response?

25 MS. JENNIFER MOROZ: Yes.

1 MR. DANIEL PEACO: Okay.

2 MS. JENNIFER MOROZ: In IR Manitoba
3 Hydro/LCA 043a, which referenced PUB/LCA 073c, you
4 referenced MISO's November 5th, 2012 presentation.

5 MR. DANIEL PEACO: Wha -- what was the
6 number of the 'I' -- the IR?

7 MS. JENNIFER MOROZ: The initial IR was
8 Manitoba Hydro/LCA 043, where you asked Manitoba Hydro
9 to please see the response to PUB/LCA 073c, and that,
10 in turn, referenced the November 5th, 2012, MISO
11 presentation.

12 MR. DANIEL PEACO: Okay. But which
13 response has the -- actually has the --

14 MS. JENNIFER MOROZ: The latter. The
15 PUB/LCA 073c.

16 MR. DANIEL PEACO: Thank you.

17 MS. JENNIFER MOROZ: Mr. Peaco, are you
18 aware that that average 358 megawatt increase in
19 interface flow was averaged over a time period of a
20 full year, as opposed to, say, a day or a week?

21 MR. DANIEL PEACO: Can I take a minute
22 to refresh?

23 MS. JENNIFER MOROZ: Yes.

24

25 (BRIEF PAUSE)

1 MR. DANIEL PEACO: Okay.

2 MS. JENNIFER MOROZ: Would you agree
3 that a new interconnection such as the ones that were -
4 - were being studied in the Wind Synergy Study would
5 connect to power systems that had different generation
6 mixes, and as well, different seasonal loads?

7 MR. DANIEL PEACO: You're talking about
8 the difference in the connection points between the two
9 (2) terminals of the two (2) lines?

10 MS. JENNIFER MOROZ: No, I was talking
11 about the fact that a proposed new interconnection of
12 the kind that was being studied by nice -- by MISO
13 would be in essence connecting one (1) power region or
14 one (1) system that had a different generation mix and
15 different seasonal loads than the one in the adjacent
16 MISO region to which it would be connecting?

17 MR. DANIEL PEACO: Referring to
18 Manitoba and MISO?

19 MS. JENNIFER MOROZ: Correct.

20 MR. DANIEL PEACO: Yes.

21 MS. JENNIFER MOROZ: Thank you. And
22 would you also agree that such a proposed
23 interconnection would have bi-directional flows that
24 would vary both on a daily basis and a seasonal basis?

25 MR. DANIEL PEACO: Yes.

1 MS. JENNIFER MOROZ: Now, in view of
2 those facts, would you agree that using the average
3 interface flow, meaning averaged over a full year,
4 would not be the best method in order to determine the
5 increased capacity that would be gained from a new
6 interconnection?

7 MR. DANIEL PEACO: Yes.

8 MS. JENNIFER MOROZ: And if I could
9 have you look at Tab 22 of Volume I of Manitoba Hydro's
10 book of documents.

11

12 (BRIEF PAUSE)

13

14 MR. CHRISTIAN MONNIN: Page -- page 87?

15 MS. JENNIFER MOROZ: Yes.

16

17 CONTINUED BY MS. JENNIFER MOROZ:

18 MS. JENNIFER MOROZ: So this chart
19 entitled, 'Manitoba Hydro MISO Interface Flow', is
20 taken from that same November 5th, 2012, presentation
21 that you had referenced in your responses to IRs. And
22 I would like to just go through this chart with you,
23 just in terms of orienting the panel to this chart.

24 If you look at the legend at the bottom,
25 the sort of dark aqua colour, that shaded colour on the

1 graph represents the baseline transmission capacity of
2 the existing Manitoba-to-US interconnection.

3 Is that right?

4 MR. DANIEL PEACO: I'm sorry?

5 MS. JENNIFER MOROZ: Is it correct that
6 the aqua shaded portions of the chart, as indicated on
7 the legend below, where it says, "base case," that
8 those aqua portions indicate the baseline transmission
9 capacity of the existing Manitoba-to-US interconnection
10 -- or interface?

11 MR. DANIEL PEACO: I would have to look
12 back at the study. I'm not sure what -- what was in
13 the base case.

14 MS. JENNIFER MOROZ: Is it clear to you
15 that the lime green shaded area above that aqua colour
16 represents the additional transmission capacity from
17 the east option?

18 MR. DANIEL PEACO: Yes.

19 MS. JENNIFER MOROZ: And if we assume
20 that the aqua shaded portion is actually the baseline
21 capacity of the existing Manitoba-to-US interface,
22 would you agree that the increase in capacity
23 represented by this chart is more in the nature of 750
24 megawatts for the east option?

25 MR. DANIEL PEACO: I guess -- from the

1 -- the size of the --

2 MS. JENNIFER MOROZ: Correct.

3 MR. DANIEL PEACO: -- shading, yes.

4 MS. JENNIFER MOROZ: The next issue I'd
5 like to canvass with you is MISO's multi-value
6 projects, which you have referred to in again the
7 Technical Appendix 8, starting at about page 8-23. So
8 based on your report, I understand that you're familiar
9 with the concept of a MISO multi-value project.

10 Is that correct?

11 MR. DANIEL PEACO: That's correct.

12 MS. JENNIFER MOROZ: And in a nutshell,
13 a MISO multi-value project allows those facilities that
14 are being -- sorry, being constructed to be cost-shared
15 among multiple users of that transmission facility, and
16 as well possibly among various regions within MISO.

17 Is that accurate to say?

18 MR. DANIEL PEACO: Yes.

19 MS. JENNIFER MOROZ: And that would be
20 in contrast to, say, a transmission project that was
21 built under Module B of MISO's tariff, which is the
22 transmission service module, whereby the transmission
23 service customer who initiates a request normally is
24 the one who would pay for any additional facilities
25 that would be required to meet the service request.

1 MR. DANIEL PEACO: That's correct.

2 MS. JENNIFER MOROZ: I would now like
3 to refer you to the direct evidence of Dr. David
4 Jacobson. And that is found in Exhibit 95, page 82 of
5 that exhibit.

6

7 (BRIEF PAUSE)

8

9 In that direct evidence, Dr. David --
10 sorry, Dr. Jacobson testified that MISO had approved
11 roughly \$2 billion worth of upgrades that were
12 categorized as multi-value projects in order to
13 facilitate renewable integration and that these
14 facilities would increase the Minnesota to Wisconsin
15 transfer capability before 2020.

16 Were you familiar with that evidence?

17 MR. DANIEL PEACO: Yes.

18 MS. JENNIFER MOROZ: And Dr. Jacobson's
19 view is that that represents a window of opportunity
20 and that the transmission service request that Manitoba
21 Hydro has submitted for exports to Wisconsin will be
22 able to capitalize on that additional capacity and yet
23 have the costs of those facilities shared regionally.

24 Would you agree that that is a window of
25 opportunity for Manitoba Hydro?

1 MR. DANIEL PEACO: Yes. And I
2 understand the -- the testimony on the position and the
3 -- and the request for transmission for transmission
4 service gives that opportunity.

5 MS. JENNIFER MOROZ: Thank you. And
6 the final issue that I wanted to canvass with you was
7 contingency reserves. And there's some commentary
8 about Manitoba Hydro's use of contingency reserves on
9 page 8-57 of Appendix 8.

10

11 (BRIEF PAUSE)

12

13 MS. JENNIFER MOROZ: I'm sorry.
14 Appendix 8 is Exhibit 11, I believe. And if we scroll
15 down just a little bit, I would like to quote from page
16 857, in which you stated that, sorry:

17 "The MISO system in the South might
18 be able to provide coverage for such
19 an event by the adequate reserves and
20 available capacity over the
21 interconnection. Manitoba Hydro did
22 not provide any documentation or
23 information that exhibited this
24 ability."

25 And when you were referring to such an

1 event, my understanding is that you were referring to
2 the loss of a Bipole.

3 Is that correct?

4 MR. DANIEL PEACO: Correct.

5 MS. JENNIFER MOROZ: Are you aware that
6 Manitoba Hydro provided rebuttal evidence on this issue
7 of contingency reserve arrangements with MISO?

8 MR. DANIEL PEACO: Yes.

9 MS. JENNIFER MOROZ: So referring to
10 Exhibit 85 at page 81, lines 12 to thre -- 12 through
11 17, Manitoba Hydro referenced that it does have a
12 coordination agreement with Mani -- sorry, with MISO
13 and that pursuant to the obligations in that agreement,
14 MISO is obligated to provide Manitoba Hydro, on
15 request, with up to 1,850 megawatts of contingency
16 reserves in the event of a contingency. And that's on
17 a firm basis.

18 Now, in view of that rebuttal evile --
19 evidence, do you still have any concerns about the
20 availability of MISO's contingency reserves?

21 MR. DANIEL PEACO: We have this
22 testimony and the cross-examination that Mr. Monnin did
23 in -- in -- of your witnesses in -- in the hearings.
24 And I've subsequently provided a response to IR,
25 indicating we now have the explanation as to how that

1 scheme works and -- and we're -- and we now understand.

2 MS. JENNIFER MOROZ: And you no longer
3 have any concerns about it?

4 MR. DANIEL PEACO: We now understand
5 how -- how it's configured, yes. Unfortunately, we
6 would -- we would hope to get the information on that
7 some time ago.

8 MS. JENNIFER MOROZ: Understandable.
9 Thank you. I have no further questions.

10 THE CHAIRPERSON: Thank you, Ms. Moroz.
11 That didn't appear so bad, was it?

12 MS. JENNIFER MOROZ: I don't know. Let
13 me think about it.

14

15 (BRIEF PAUSE)

16

17 THE CHAIRPERSON: We probably should
18 take a five (5) minute break for the benefit of the
19 participants.

20

21 --- Upon recessing at 3:44 p.m.

22 --- Upon resuming at 3:52 p.m.

23

24 THE CHAIRPERSON: I believe that
25 everybody is in position to resume to proceedings, so

1 I'll turn the microphone over to you, Ms. Boyd.

2 Welcome back, by the way.

3 MS. MARLA BOYD: Thank you, Mr. Chair.

4 Good afternoon. Good afternoon, panel.

5 MR. DANIEL PEACO: Good afternoon.

6

7 CROSS-EXAMINATION BY MS. MARLA BOYD:

8 MS. MARLA BOYD: You may already know

9 I'm Marla Boyd. And I'm going to start this afternoon
10 with LA Volume II, which is Manitoba Hydro Exhibit 167-
11 2.

12 And looking at Tab 1, are you familiar
13 with the finance textbook that's included in Manitoba
14 Hydro's book of documents? It's by Stephen Ross,
15 Randolph Westerfield, and Jeffery Jaffrey, called
16 'Corporate Finance'?

17 MR. JOHN ATHAS: I -- I believe that I
18 noticed that it was in -- that the title once or twice,
19 but I'm not sure that I am very familiar with it at
20 all.

21 MS. MARLA BOYD: And do you recall that
22 Manitoba Hydro's expert witness, Dr. Borison, reviewed
23 this text in his evidence?

24 MR. JOHN ATHAS: Yes.

25 MS. MARLA BOYD: And on page 11 of

1 Schedule 3 of Manitoba Hydro's rebuttal evidence, which
2 is Manitoba Hydro Exhibit number 85. Navigant refers
3 to page 186 of that textbook as support for the use of
4 the net present value as a primary metric for the
5 economic evaluation of alternative development plans.

6 Do you aca -- recall reviewing that?

7 MR. JOHN ATHAS: Yes, I recall
8 discussion about the net present value.

9 MS. MARLA BOYD: And would you agree
10 that net pres -- present value is the primary measure
11 of the economics of resource plans?

12 MR. JOHN ATHAS: I would agree that
13 it's a -- it's a metric that's produced in almost all
14 resource planning. The primary metric is a question on
15 how the decision is made.

16 MS. MARLA BOYD: I'm sorry, it's the
17 primary metric, or...?

18 MR. JOHN ATHAS: It -- prime -- whether
19 it's primary or not is depending upon the decision
20 criteria that's being applied to all the metrics.

21 MS. MARLA BOYD: And you'd accept that
22 it's used predominantly in evaluating resource plans?

23 MR. JOHN ATHAS: It is used in some
24 manner, yes.

25 MS. MARLA BOYD: Thank you. At Tab 3

1 of our book of documents, LA provided valuation advice
2 to the New Hampshire Public Utilities Commission on the
3 valuations of the Public Service Company of New
4 Hampshire. That's a report that's dated March 31st of
5 2014.

6 Is that correct?

7 MR. JOHN ATHAS: Yeah, that's correct.

8 MS. MARLA BOYD: And did any of you
9 participate in the preparation of that report?

10 MR. DANIEL PEACO: No.

11 MS. MARLA BOYD: Are you familiar with
12 the contents of the report?

13 MR. DANIEL PEACO: I'm familiar the
14 report was done, but it was done by another project
15 team.

16 MS. MARLA BOYD: And I've included some
17 excerpts of the report in our book of documents. I'd
18 just ask you to turn to them. To quote from page 19 of
19 this report, "La Capra Associates" -- it's at the top:

20 "La Capra Associates's determination
21 of the value of the generation assets
22 is based primarily on a discounted
23 cash flow, or DCF, analysis of the
24 anticipated future costs and
25 revenues."

1 Do you see that?

2 MR. DANIEL PEACO: Yes, we do.

3 MS. MARLA BOYD: Does that mean that La
4 Capra used net present value as your primary method?

5 MR. JOHN ATHAS: For the valuation of
6 existing assets, yes.

7

8 (BRIEF PAUSE)

9

10 MS. MARLA BOYD: In your direct
11 evidence this week, you also addressed the use of
12 internal rate of return, or IRR, and cumulative present
13 value, CPV, as additional helpful tools to supplement
14 decision making.

15 Is that correct?

16 MR. JOHN ATHAS: Yes.

17 MS. MARLA BOYD: And I correct in
18 understanding that CPV considers the present value of
19 costs and revenues up to a particular point in time?

20 MR. JOHN ATHAS: That's correct.

21 MS. MARLA BOYD: And CPV ignores all
22 cash flows, either positive or negative, that occur
23 beyond that point in time?

24 MR. JOHN ATHAS: By definition.

25 MS. MARLA BOYD: And if I were to take

1 a CPV at, say, thirty-five (35) or fifty (50) years and
2 add back in the residual value at that point, that
3 would essentially get me back to the seventy-eight (78)
4 year NPV analysis, would it not?

5 MR. JOHN ATHAS: Yes, it would mean I
6 wasted my time in calculating the thirty-five (35) year
7 in the present CPV.

8 MS. MARLA BOYD: Thank you. The New
9 Hampshire work did use either IRR or CPV, did it?

10 MR. CHRISTIAN MONNIN: Ms. Boyd,
11 they've been quite clear that their team was not
12 involved in preparing the New Hampshire report. So
13 you're asking them to speak to a report that they had
14 no involvement with.

15 MS. MARLA BOYD: Are you aware of the
16 contents of the report?

17 MR. DANIEL PEACO: I'm -- I'm generally
18 aware of the contents of the report, but I have been
19 quite engaged in preparing for another case.

20 MS. MARLA BOYD: Understandably. You
21 did indicate to Ms. Van Iderstine on Monday that when
22 representatives of your firm were giving evidence, that
23 you knew what they were working on and what the
24 evidence was about.

25 Is that correct?

1 MR. DANIEL PEACO: Yes, and I knew that
2 the team was working on this and I know what the
3 evidence is about.

4 MS. MARLA BOYD: And are -- are you
5 able to comment on whether or not the IRR or CPV
6 metrics were used in that work?

7 MR. DANIEL PEACO: Our discounted cash
8 flow analysis does a -- an internal rate of return
9 merchant calculation, so to that extent it does.

10 MS. MARLA BOYD: And that would be
11 where you used the interest rate and then solve for the
12 purchase price.

13 Is that correct?

14 MR. DANIEL PEACO: That's correct.

15 MS. MARLA BOYD: And in essence is that
16 not also considered NPV in most circles?

17 MR. DANIEL PEACO: Yeah, you -- you
18 result in a present value.

19 MS. MARLA BOYD: Thank you.

20 In your Appendix 9A on page 24, you
21 state that it's common practice in evaluating utility
22 investments to look at year-by-year effects. Do you
23 recall that?

24 MR. JOHN ATHAS: Yes.

25 MS. MARLA BOYD: You then indicated

1 that LCA undertook this analysis using cumulative
2 present values truncated at different points in time,
3 correct?

4 MR. JOHN ATHAS: That's correct.

5 MS. MARLA BOYD: And you go on to state
6 in the report at page 25 that LCA believes it's more
7 appropriate to look at how each plan's incremental
8 costs translate into ratepayer impacts in a revenue
9 requirement analysis.

10 Is that correct?

11 MR. JOHN ATHAS: That's correct.

12 MS. MARLA BOYD: Turning to the use of
13 a seventy-eight (78) year time frame, would you agree
14 that it's important to try and capture the full
15 economic value of the assets when comparing options?

16 MR. JOHN ATHAS: To calculate the NPV
17 metric, I think that's correct.

18 MS. MARLA BOYD: So by way of a simple
19 example, if I or my boss were looking at buying a
20 future retirement property down south and comparing
21 buying a house to buying a trailer, I'd certainly want
22 to recognize the shorter life of the trailer, wouldn't
23 I?

24 MR. JOHN ATHAS: Not if you were
25 worried about how much money was in the bank and you

1 hadn't the sold the house yet. The residual value is
2 like -- it's not cash, it's resi -- it's value that if
3 you dispose of the asset or you do something, you can
4 realize it. In a cash flow analysis it's not cash,
5 it's --

6 MS. MARLA BOYD: And at the end --
7 sorry. Were you finished?

8 MR. JOHN ATHAS: It's a value.

9 MS. MARLA BOYD: It's a value. At the
10 end of the day, don't I have to consider the residual
11 value?

12 MR. JOHN ATHAS: It should be
13 considered; that's one (1) reason why we -- NPV is in
14 our analysis. I -- I just point out that it's not a --
15 as with the CPVs that are there, it is -- it is not a
16 cash flow at that -- at the year 78. So if you're
17 worried about what the situa -- how the cash flow is by
18 a certain period of time, it is irrelevant.

19 MS. MARLA BOYD: And the house that
20 your referred to me selling, I could sell for cash,
21 could I not?

22 MR. JOHN ATHAS: Yes, you could.

23 MS. MARLA BOYD: What would be the
24 interest in focussing on cash flow in an economic
25 analysis?

1 MR. JOHN ATHAS: If -- if the -- at the
2 point -- at the end of -- of some -- of a -- asset's
3 useful life that's a good point to stop. There are
4 many resources in the -- in a resource plan, not all
5 have the exact end-of-life. Hopefully, they don't have
6 -- all have the same end of life as one (1) particular
7 year so that the -- so that calculating the -- the --
8 looking at the cash flow, to me, is very relevant,
9 especially in the shorter periods of time because there
10 are different parties that have con -- liabilities
11 involved with the support of an asset or a plan.

12 There are different people that have
13 paid electric bills only up to that point in time. And
14 since they're not going to get a cheque in the mail if
15 they -- if they -- for the business at the end of --
16 year 35, it's, I think -- for instance, it's a pretty
17 relevant parameter for them.

18 MS. MARLA BOYD: The goal of the
19 economic analysis is deter -- to determine which option
20 makes the most sense, correct?

21 MR. JOHN ATHAS: Exactly.

22 MS. MARLA BOYD: And the cash flow
23 analysis determines whether or not you can afford that
24 option?

25 MR. JOHN ATHAS: A financial analysis

1 would determine whether you could afford that option
2 for the -- on -- on the company's books.

3 MS. MARLA BOYD: So the first step in
4 your process is to determine whether or not you're
5 making the best economic choice, correct?

6 MR. JOHN ATHAS: It would be to
7 determine if there is a -- an economic value at the end
8 of seventy-eight (78) years that you think might be
9 worth going after.

10 MS. MARLA BOYD: Thank you.

11

12 (BRIEF PAUSE)

13

14 MS. MARLA BOYD: Turning to page 24 of
15 Appendix 9A, you stated in your report:

16 "It is common for decision makers to
17 place much less weight on long-term
18 forecasts of long-term benefits."

19 Do you recall that?

20 MR. JOHN ATHAS: That's correct.

21 MS. MARLA BOYD: And discounting an NPV
22 analysis gives less weight to future events than those
23 that are closer in time, correct?

24 MR. JOHN ATHAS: Yes.

25 MS. MARLA BOYD: And if I could turn

1 you to page 16 of your Appendix 9A, about halfway down
2 the page? Thank you. You have analyzed -- or,
3 outlined the characteristics of an unleveraged cashflow
4 analysis, and we just reviewed those, that there's no
5 finance-related costs?

6 MR. JOHN ATHAS: Correct.

7 MS. MARLA BOYD: And all annual costs
8 during the development construction of any capital
9 project are treated the same as if they were expense
10 cash requirements?

11 MR. JOHN ATHAS: Yes.

12 MS. MARLA BOYD: And there is no
13 corresponding capitalization to include elements such
14 as interest during construction?

15 MR. JOHN ATHAS: Yes.

16 MS. MARLA BOYD: And this approach does
17 not translate capital expenditures into the series of
18 annual revenue requirement dollars that would be
19 included in annual cost of service totals for rate-
20 making purposes?

21 MR. JOHN ATHAS: That's correct.

22 MS. MARLA BOYD: And just to clarify,
23 these are standard characteristics for this type of
24 analysis, correct?

25 MR. JOHN ATHAS: In resource planning,

1 most -- I would -- more often than not, I would
2 actually see some sort of revenue requirement
3 translation.

4 MS. MARLA BOYD: The unleveraged
5 cashflow methodology or analysis includes all of these
6 characteristics typically, correct?

7 MR. JOHN ATHAS: I believe these are
8 characteristics that it doesn't include.

9 MS. MARLA BOYD: Okay. You flipped my
10 question around, but yes, these are things that are
11 typical of that type of analysis, or -- or typically
12 not included in that analysis?

13 MR. JOHN ATHAS: That's correct.

14

15 (BRIEF PAUSE)

16

17 MS. MARLA BOYD: You indicated in your
18 second last response to me that you'd expect some type
19 of revenue requirement analysis. Did I -- did I get
20 you correctly?

21 MR. JOHN ATHAS: That's correct.

22 MS. MARLA BOYD: And you're aware that
23 Manitoba Hydro completed that in Chapter 11 of its --
24 its appendix -- it -- its filing?

25 MR. JOHN ATHAS: Yes, financial

1 analysis.

2 MS. MARLA BOYD: Thank you. If I can
3 turn to page 92 of 9A? Looking at the first paragraph
4 under the discount rate sensitivity, you've indicated
5 that LCA assigned a zero probability to the Manitoba
6 Hydro low discount rate case of 3.35 percent in real
7 terms?

8 MR. JOHN ATHAS: Yes.

9 MS. MARLA BOYD: And are you aware that
10 the 3.35 real discount rate has an embedded long Canada
11 bond rate of 2.3 percent?

12 MR. JOHN ATHAS: That sounds correct.

13 MS. MARLA BOYD: And if you need a
14 reference, it's in CAC/Manitoba Hydro 1-127. If I
15 could refer you to Manitoba Hydro's rebuttal evidence,
16 that's Exhibit 85, page 126, lines 27 to 30? Manitoba
17 Hydro indicated in this response that:

18 "Real interest rates have been at or
19 below the rates that underlie our
20 load case for 17 percent of the time
21 since April of 2008."

22 Do you recall reviewing that?

23 MR. JOHN ATHAS: Yes.

24 MS. MARLA BOYD: And given that, how
25 can you conclude that there is zero possibility that

1 such rates would occur?

2 MR. JOHN ATHAS: For seventy-eight (78)
3 years, I don't necessarily get convinced from that --
4 from that twelve (12) of the last sixty-nine (69)
5 months.

6 MS. MARLA BOYD: But it's not zero
7 possibility, is it? There's a demonstration in front
8 of you that it's occurred.

9 MR. JOHN ATHAS: You -- you -- there's
10 -- well, there's definitely not zero probability of the
11 -- the absolute extremes of any distribution, but when
12 you're doing the -- when you're doing a -- a decision
13 analysis and certainty analysis, you don't nece --
14 necessarily run with the -- with the last -- with the -
15 - with the most extreme value of the -- of the curves,
16 but you would have -- so my -- my question -- my -- my
17 response is that it wasn't necessary to assign any
18 probability to that in order to represent what we
19 believe is a -- a more appropriate distribution.

20 MS. MARLA BOYD: So Manitoba Hydro had
21 assigned probabilities of 15 percent low, 50 percent
22 reference, and 35 percent high.

23 Is that correct?

24 MR. JOHN ATHAS: Excuse me, if you
25 could repeat the question? I'm sorry.

1 MS. MARLA BOYD: Sure. Manitoba Hydro
2 had assigned probabilities of 15 percent to the low dis
3 -- discount rate, 50 percent to the reference discount
4 rate, and twenty 20 -- 35 percent to the high discount
5 rate.

6 Do you recall that?

7 MR. JOHN ATHAS: That's correct.

8 MS. MARLA BOYD: And LCA has changed
9 those probabilities to zero percent for low, 50 percent
10 for reference, and 50 percent for high?

11 MR. JOHN ATHAS: That's correct.

12 MS. MARLA BOYD: And so could you
13 explain why you would choose to shift the probabilities
14 to the 50:50 ref and high?

15

16 (BRIEF PAUSE)

17

18 MR. JOHN ATHAS: We hadn't had a very
19 detailed discussion on probability of the -- of those
20 two (2) remaining scenarios by themselves with -- with
21 MPA at the time, and I used 50:50 as just a -- as a --
22 as the point that you would use when you don't have any
23 better information.

24 MS. MARLA BOYD: Why wouldn't you use
25 thirty-three (33), thirty-three (33), thirty-three

1 (33)?

2 MR. JOHN ATHAS: Because I already
3 eliminated the -- the probability of -- of being too
4 extreme of the -- the low interest rate scenario. With
5 some testing, the ability to -- testing, what happens
6 if you had a perspective that you're eliminating the
7 low interest rate scenario. I used it -- used the -- a
8 lot of analysis here with the Manitoba Hydro
9 probabilities.

10 MS. MARLA BOYD: But you didn't
11 eliminate the 50 percent high. If you were eliminating
12 extremes, you only eliminated the low extreme.

13 Is that fair?

14 MR. JOHN ATHAS: That's correct.

15

16 (BRIEF PAUSE)

17

18 MS. MARLA BOYD: Have you undertaken
19 any analysis of the assignment of probabilities?

20 MR. JOHN ATHAS: No.

21 MS. MARLA BOYD: And are you aware that
22 Manitoba Hydro undertook an analysis of that to -- to
23 derive its probabilities? That's Appendix 9.3.

24 MR. JOHN ATHAS: Yes, I'm aware that
25 there was an -- that there was an analy -- analytical

1 exercise starting with opinions about probabilities at
2 one (1) point to -- to arrive at the final
3 probabilities.

4 MS. MARLA BOYD: And you didn't do any
5 similar analysis?

6 MR. JOHN ATHAS: For sensitivities,
7 it's not always -- it's not -- it wasn't necessarily
8 trying to prove the other one wrong. It's providing a
9 sensitivity of -- of metric with information as to what
10 -- as to how it might be if it was -- if people
11 considered that appropriate.

12 MS. MARLA BOYD: So the zero, 50:50 is
13 not LCA's assessment of what's appropriate? It's a
14 sensitivity?

15 MR. JOHN ATHAS: Sensitivity.

16 MS. MARLA BOYD: And did you look at
17 what the interest rates had been over the last sixty-
18 nine (69) months?

19 MR. JOHN ATHAS: No.

20 MS. MARLA BOYD: You knew that it
21 hadn't occurred that -- that two point three (2.3) had
22 occurred in the last sixty-nine (69) months twelve (12)
23 times?

24 MR. JOHN ATHAS: I believe my
25 conversation with MPA representatives was that this is

1 the lowest that it's -- it's been -- the lowest it's
2 ever been at that level that that was assumed for a few
3 -- for several months recently, but that it would be
4 extremely improbable that it could be a -- an interest
5 rate that would prevail the seventy-eight (78) years.

6 MS. MARLA BOYD: Had you looked at how
7 many, if any, months there had been a high interest
8 rate in the last sixty-nine (69) months?

9 MR. JOHN ATHAS: Nope.

10 MS. MARLA BOYD: You didn't look at it?

11 MR. JOHN ATHAS: No.

12 MS. MARLA BOYD: Would it surprise you
13 to know that there were zero?

14 MR. JOHN ATHAS: It wouldn't surprise
15 me that they could be zero.

16

17 (BRIEF PAUSE)

18

19 MS. MARLA BOYD: LCA also did some work
20 for the Massachusetts Department of Energy Resources,
21 September 30th of 2013. I have that at Tab 2 of the
22 book of documents.

23 MR. JOHN ATHAS: Yes.

24 MS. MARLA BOYD: Are you familiar with
25 that work?

1 MR. JOHN ATHAS: Somewhat, yes.

2 MS. MARLA BOYD: I just want to bring
3 your attention to the key assumptions that are on page
4 5 of that report. That's page 4 of the book of
5 documents. LCA's assessment at that point was use of a
6 5 percent nominal rate and assumption and a real
7 discount rate of approximately 2.4 percent.

8 Is that correct?

9 MR. CHRISTIAN MONNIN: Again, Ms. Boyd,
10 I just want to bring attention to the panel that none
11 of the representatives of La Capra were involved with
12 writing this report.

13 MS. MARLA BOYD: I'm sorry, I believe
14 Mr. Athas just told me he was somewhat familiar with
15 it.

16 MR. CHRISTIAN MONNIN: He might be
17 familiar, but he did not write the report is what I
18 said.

19

20 CONTINUED BY MS. MARLA BOYD:

21 MS. MARLA BOYD: Fair enough. If he
22 can't answer the question, that's fine.

23 MR. JOHN ATHAS: Many of the
24 assumptions in this report reflect the -- the
25 perspective of the Department of Energy in

1 Massachusetts and not necessarily the perspective of La
2 Capra Associates.

3 MS. MARLA BOYD: Perhaps I read the
4 footnote wrong, but it seemed to me that it was
5 explaining that LCA used 2.4 percent, and in fact that
6 was higher than what the AESC study used at 1.36
7 percent. I thought the message was that LCA was being
8 conservative in using 2.4 percent.

9 Is that not right?

10 MR. JOHN ATHAS: That's absolutely
11 correct that we used that. It doesn't say anything
12 about whether that was our endorsement or the -- or the
13 Department of Energy's consideration.

14 THE CHAIRPERSON: Ms. Boyd, could you
15 repeat the reference to the document that you're
16 discussing?

17 MS. MARLA BOYD: Yes, it's in our
18 Volume II book of documents at Tab 2.

19 THE CHAIRPERSON: Thank you.

20 MS. MARLA BOYD: It's a Massachusetts
21 Department of Energy Resources, and on page 4 of the
22 book of documents there's a list of key assumptions.

23 Footnote 7 at the bottom includes the 5
24 percent nominal rate, two point five (2.5) inflation,
25 and the discount rate of 2.4 percent.

1 (BRIEF PAUSE)

2

3 MS. MARLA BOYD: Mr. Chair, your mic.

4 THE CHAIRPERSON: Sorry.

5

6 CONTINUED BY MS. MARLA BOYD:

7 MS. MARLA BOYD: Thanks. I'm going to
8 move on to Tab 4. Yesterday La Capra presented figures
9 such as the one that's shown at Tab 4 in your direct
10 evidence, showing uncertainty analysis of alternatives
11 using an All Gas as a baseline.

12 And in page 67 of your report, which is
13 at page 10 of our book of documents, the dotted red
14 line represents the All Gas scenario, the vertical
15 line, correct?

16 MR. JOHN ATHAS: That's correct.

17 MS. MARLA BOYD: And Dr. Grant asked
18 you about the effects of these figures or on these
19 figures of changing the baseline from All Gas to the
20 Preferred Development Plan.

21 Do you recall that?

22 MR. JOHN ATHAS: That's correct.

23 MS. MARLA BOYD: And when you answered
24 that question, Mr. Athas, you referred to that figure,
25 contrasting the LCA uncertainty analysis approach with

1 the Manitoba Hydro uncertainty analysis approach.

2 And in that case, the blue dotted line
3 is showing the LCA approach to the Preferred
4 Development Plan, correct?

5 MR. JOHN ATHAS: That's correct.

6 MS. MARLA BOYD: And on that table, the
7 -- the top figure -- or the top table in the figure
8 provides statistics for the two (2) alternatives using
9 what's described as the LCA approach?

10 MR. JOHN ATHAS: That's correct.

11 MS. MARLA BOYD: And, for example, in
12 that case the -- the All Gas Plan has no variation,
13 it's all zeros?

14 MR. JOHN ATHAS: It was --

15 MS. MARLA BOYD: Do you see that?

16 MR. JOHN ATHAS: -- zeroes in the base
17 case, that's correct.

18 MS. MARLA BOYD: And the Preferred
19 Development Plan varies from the 10th percentile of
20 negative 1.9 billion, or one nine one three (1.913), to
21 what's described as a 90th percentile reward of fifty-
22 eight sixty-two (5862).

23 Do you see that?

24 MR. JOHN ATHAS: That's correct.

25 MS. MARLA BOYD: And as I understand

1 it, the fifty-eight sixty-two (5862) is actually the
2 95th percentile and that number should have been
3 corrected to fifty-five sixty-seven (5567).

4 Do you recall that? I believe you've
5 corrected it elsewhere.

6 MR. JOHN ATHAS: Yes, there's a few
7 times we haven't caught the fact that when we picked up
8 the software it had 95 percent --

9 MS. MARLA BOYD: Okay. So --

10 MR. JOHN ATHAS: -- for Manitoba Hydro.

11 MS. MARLA BOYD: -- fifty-five sixty-
12 seven (5567) is the correct number?

13 MR. JOHN ATHAS: Yeah.

14 MS. MARLA BOYD: And you indicated in
15 your -- in your response to Dr. Grant that changing the
16 baseline with the LCA approach would effectively be to
17 flip the graphic, as you described it, whereby the
18 position of the two (2) alternatives would be switched.
19 The Preferred Development Plan would become the
20 vertical line and the All Gas would be the S-curve
21 showing the variation.

22 Is that correct?

23 MR. JOHN ATHAS: I -- I think we had a
24 kind of corner-to-corner flip, yeah, something to that
25 effect.

1 MS. MARLA BOYD: Well, actually
2 Manitoba Hydro has taken the liberty at Tab 5 of
3 providing a flipped figure.

4 MR. JOHN ATHAS: Thank you.

5 MS. MARLA BOYD: Through the magic of
6 technology. So do you -- just to walk through that.
7 This provides the same statistics with the changed
8 baseline. So in this case the Preferred Development
9 Plan has no variation. It's all zeroes.

10 Do you see that?

11 MR. JOHN ATHAS: That's correct.

12 MS. MARLA BOYD: And the All Gas varies
13 from the 10th percentile of negative fifty-five sixty-
14 seven (5567) to the 90th percentile of nineteen
15 thirteen (1913).

16 Do you agree?

17 MR. JOHN ATHAS: Looks right.

18 MS. MARLA BOYD: It appears that with
19 the All Gas baseline, the All Gas alternative has no
20 risk and the Preferred Development Plan has
21 considerable risk. However, when you flip the graph
22 and the Preferred Development Plan becomes the
23 baseline, it appears to have no risk while the All Gas
24 Plan has considerable risk.

25 Do you agree?

1 MR. JOHN ATHAS: I -- I believe you
2 could make the same inferences from the prior chart as
3 well, because we -- our chart shows whether the --
4 whether the -- when the All Gas Pla -- how many -- what
5 percentiles or what -- on percentage points the All Gas
6 Plan would be higher cost than the -- than the
7 Preferred Plan. And I can read those numbers right off
8 that -- right off of this curve. So I don't believe it
9 changes perspective. It just -- it just changes lens.

10 MS. MARLA BOYD: For the purposes of
11 the uncertainty on that analysis, is there any
12 particular reason that you have to choose, or should
13 choose, All Gas as the baseline?

14 MR. JOHN ATHAS: No, we have several
15 charts in our -- in our figures that we actually choose
16 other ones as baselines. We were following the
17 convention set forth by the -- Manitoba Hydro in the
18 NFAT.

19 MS. MARLA BOYD: Well, to be fair,
20 Manitoba Hydro used All Gas ref/ref/ref rather than the
21 twenty-seven (27) different scenarios as its baseline,
22 correct?

23 MR. JOHN ATHAS: Yes, but they -- they
24 -- that's because Manitoba Hydro -- well, at expected
25 value they also -- you also subtract the -- the Gas

1 case. And so it's -- so when the -- you didn't
2 calculate the information that we calculated, which is
3 one of the economics at the different points of one (1)
4 -- of one (1) plan versus the All Gas.

5 MS. MARLA BOYD: On Monday, at
6 transcript page 5,669, LCA indicated that the primary
7 value of these figures...

8

9 (BRIEF PAUSE)

10

11 MR. JOHN ATHAS: One (1) -- one (1)
12 correction then -- then I'm going to have to ask you to
13 repeat your question, because I was --

14 MS. MARLA BOYD: Sure.

15 MR. JOHN ATHAS: There are some tables
16 in the -- in the NFAT filing where the -- where the --
17 each of the plans were subtracted from the -- their
18 corresponding branch of the -- of -- of the All Gas
19 Plan. So there -- there's a quilt with all zeroes in
20 there for All Gas, much like we did. The difference is
21 there hasn't -- there's hasn't -- it -- it's never been
22 plotted in a risk profile.

23 MS. MARLA BOYD: Thank you. So I was
24 turning you to transcript page 5,669. And you
25 indicated on Monday that the primary value of these

1 figures -- and I'm referring to the two (2) that are in
2 the book of documents -- or the one (1) that's in the
3 book of documents, the type of figure that you had done
4 at Tab 4, that the values of those figures is to
5 demonstrate that the plans perform differently under
6 different conditions.

7 Is that right?

8 MR. JOHN ATHAS: That's correct.

9 MS. MARLA BOYD: So what would you
10 advise the Board to be taking from this regarding the
11 risk of various alternatives?

12 MR. JOHN ATHAS: I believe they could
13 look at the -- the potential benefits and the potential
14 penalties of choosing one (1) plan over the All Gas
15 Plan on a probabilistic distribution basis.

16 And -- and since this -- as we had a
17 discussion with -- many times about the issue of
18 liability and merchant versus utility and -- and other
19 things, this is the -- since there is no -- a do
20 nothing base case that's around as a -- as a real
21 option that you have to plan the system, as was
22 mentioned earlier today, to a liability criteria. To
23 me that is a very good expression of value.

24 MS. MARLA BOYD: Would you agree that
25 when Manitoba Hydro compares to the All Gas ref/ref/ref

1 that display of risk is not sensitive to the baseline,
2 there's only one (1) view, the ref/ref/ref view?

3 MR. JOHN ATHAS: Well, I might as well
4 make it clear, I believe that when you show your risk
5 profile all compared to ref/ref/ref, you're essentially
6 showing the variation in your cost, not the variation
7 in your benefits. It's -- because it -- it has the
8 variation of the cost of that plan if it was enacted.
9 And it doesn't necessarily show anything about whether
10 I would have -- whether I would have -- if I -- if I
11 wanted to favour that, but a particular branch, whether
12 I would have made a decision in a different manner.

13 MS. MARLA BOYD: You understand
14 Manitoba Hydro's analysis to be an NPV, correct? It
15 includes both costs and benefits?

16 MR. JOHN ATHAS: Yes, but the only
17 thing that varies when you go across the profile is
18 cost.

19

20 (BRIEF PAUSE)

21

22 MR. JOHN ATHAS: Maybe I could be
23 helpful to explain what I might have lip synced to be
24 some doubt. That the -- I believe it was testified by
25 the Manitoba Hydro panel that -- that you could have

1 taken a difference of any value to produce the -- the
2 risk profiles that were -- that Manitoba Hydro elected
3 to put into the NFAT, and make some observations and
4 conclusions of that.

5 What -- what the -- what we are -- what
6 -- what I believe we have done is completely consistent
7 with the information that's the primary information
8 that was discussed within the -- within the NFAT, which
9 is to say, What is the economic comparison between
10 plans.

11 And in that NFAT analysis, all of
12 Chapter 9 go -- goes through and says, Let me -- let me
13 talk about the value of a -- of a plan under these
14 reference conditions by comparing it to my lowest cost
15 investment plan, All Gas.

16 That tells me -- that calculates a value
17 number. As a matter of fact, it's talked about a lot,
18 1.696 million is probably etched in everybody's brain,
19 and it's the last thing they think about before they go
20 to sleep at night.

21 That number is the same number that I
22 calculate for each of the branches on -- on a -- on a
23 conceptual basis. Therefore, I believe it's
24 determining -- just it -- it is -- I'm estimating the
25 value of a plan versus the base case chosen under the -

1 - under the different conditions of the plan.

2 The only thing that varies when you
3 calculate your other points of the quilt is the cost of
4 the particular plan, and it doesn't give me any
5 indication of whether the cost of the base case plan
6 changed more or less. That's why I kind of tried to
7 conceptualize what didn't make any sense to me as a
8 cost profile.

9 MS. MARLA BOYD: The NPV includes
10 benefits and costs, correct?

11 MR. JOHN ATHAS: The NPV that is in the
12 other -- it's not a -- okay, let -- let's -- let me --
13 let's back up. The steps, I understand, from the
14 process, is you've calculated an NPV of a plan when you
15 include revenue for export sales. That, I believe, is
16 an interim calculation before you start talking about
17 whether a plan's good or not. It's all related to net
18 costs of a plan. I don't believe it's a net benefit of
19 a plan, I believe it's a net cost to choosing that
20 plan.

21 You -- you -- in Chapter 9, all the
22 discussions of net benefit are derived by subtracting
23 the costs of that particular plan under reference
24 conditions from the cost of the all gas parameter of
25 the reference conditions and thus, the one point six-

1 nine-six (1.196) and all the other numbers that you
2 compare to.

3 MS. MARLA BOYD: Thank you. I'm going
4 to move on to Tab 6 of Manitoba Hydro's book of
5 documents. Page 12 of the book of documents shows
6 slide 29 from your direct evidence on Monday.

7 MR. JOHN ATHAS: Yes.

8 MS. MARLA BOYD: This is the case that
9 you reviewed a little bit earlier that -- it includes
10 DSM, which was increased to be 150 percent of the base
11 DSM, correct?

12 MR. JOHN ATHAS: Correct.

13 MS. MARLA BOYD: And it also
14 incorporates a reduction to the load forecast due to
15 fuel switching.

16 MR. JOHN ATHAS: Correct.

17 MS. MARLA BOYD: And you, in your
18 request to Manitoba Hydro to make adjustments for the
19 LCA no generation load line, made two (2) adjustments
20 to the 2012 net load forecast, correct?

21 MR. JOHN ATHAS: Those were the two (2)
22 requested changes to the load forecast.

23 MS. MARLA BOYD: That is the reduction
24 of the load forecast to be equivalent to the 2013 load
25 forecast and incorporating Level 1 DSM?

1 MR. JOHN ATHAS: No. The -- the -- I
2 didn't think we were going to revisit this again. We
3 wanted to see what exactly it says here. Some DSM
4 that's more than in the base case, some fuel switching
5 that also helps mitigate the capacity need in the
6 winter to go along with the -- the -- something that
7 just perhaps -- like the transmission that reduces the
8 dependable energy requirements.

9 In the course of that discussion, we
10 were -- there was a lot of discussion that -- that
11 said, Perhaps you should use the 2013 numbers. And --
12 and -- but -- and if the -- and there was a time when
13 it was thought that we would be comfortable with using
14 the 2013 numbers in the 2012 analysis if it was a good
15 proxy and was going to save effort for the Manitoba
16 Hydro staff.

17 MS. MARLA BOYD: You had a discussion
18 this morning with Mr. Hacaault where you discussed the
19 Level 2 DSM, which includes fuel switching, being
20 similar in nature to the -- the No Generation LCA
21 option, correct?

22 MR. JOHN ATHAS: The understanding is
23 that the -- the load level represented by the 2013 load
24 forecast with the Level 2 DSM is fairly close to the
25 loads that were used by the -- by the -- in the -- by

1 Manitoba Hydro when they ran this No -- No New
2 Generation case for us.

3 Naturally, it's fairly close to the
4 subjective and fairly -- and it's averaged over a
5 longer curve. It is not as close in the early years as
6 it is in the later years.

7 MS. MARLA BOYD: And Mr. Wojczynski
8 provided you or your counsel yesterday with the
9 document that's at page 18 of our book of documents.
10 Do you have that? That's the one. Thank you.

11 I think this visually demonstrates what
12 you were just talking about, that if you look at the
13 black line, that's the LCA adjusted load.

14 MR. JOHN ATHAS: It's exactly what I
15 was picturing in my mind when I was describing it.

16 MS. MARLA BOYD: Great. And the orange
17 line then is the level 2 DSM that we've been
18 discussing. You can see that it runs under and then
19 crosses over.

20 Is that right?

21 MR. JOHN ATHAS: Yes, assuming that --
22 assuming it says that the -- that's all to the 2013
23 load forecast.

24 MS. MARLA BOYD: Turning over the page
25 to page 19 of our book of documents, this is slide

1 number 32 from your direct evidence. I just wanted to
2 spend a minute reviewing the discussion you had with
3 Dr. Bel yesterday regarding the economics of that No
4 Generation case.

5 In fairness, I think, just to be clear,
6 your position is not that you're advancing this as a
7 viable plan, but that it's a hypothetical plan that
8 demonstrates the potential benefits from increasing
9 DSM, a larger interconnection, and relaxed import
10 limits.

11 Is that fair?

12 MR. JOHN ATHAS: That's fair, and the
13 converse is also true: that it -- that it demonstrates
14 that there's no penalty by trying to pursue a plan that
15 delays the -- the introduction of generation into the
16 Manitoba Hydro system.

17 MS. MARLA BOYD: Okay. Well, we'll
18 talk about that one, but -- this graph shows at the
19 right-hand side that the -- the No Generation case is
20 the black line along the top, correct?

21 MR. JOHN ATHAS: That's correct.

22 MS. MARLA BOYD: And at the -- at the
23 far right side of the graph, the -- that case seventy-
24 eight (78) -- the No Generation case seventy-eight (78)
25 year NPV is almost as good as the Preferred Plan.

1 Is that right?

2 MR. JOHN ATHAS: That's correct.

3 MS. MARLA BOYD: The Preferred -- the
4 Preferred Plan is the blue line?

5 MR. JOHN ATHAS: Yeah, but the number
6 is -- I prefer to make an observation that the number
7 is lower than the blue line and not necessarily say
8 good.

9 MS. MARLA BOYD: Okay. Now, that No
10 Generation case included the benefits of expanding DSM,
11 including fuel-switching, correct?

12 MR. JOHN ATHAS: That's correct.

13 MS. MARLA BOYD: And the Preferred Plan
14 economics that are shown on this graph do not include
15 expanded DSM.

16 Is that correct?

17 MR. JOHN ATHAS: That's correct.

18 MS. MARLA BOYD: So would you agree
19 that the Preferred Plan economics would improve
20 relative to the No Generation case if it also included
21 the benefits of expanding DSM?

22 MR. JOHN ATHAS: Not if you put the --
23 the DSM in the All Gas case as well.

24 MS. MARLA BOYD: Well, if you compare
25 it to the No Generation case, the Preferred Plan would

1 be higher, correct? The line would be higher.

2 MR. JOHN ATHAS: I -- I don't know
3 that. I mean, you -- you're talking about, Maybe we
4 should have done a -- maybe we should have done an
5 analysis that we had have discussed with the -- with
6 Manitoba Hydro people at the time is -- why don't we
7 put DSM in all the cases? And we said, Go ahead, run
8 them, if you -- but please, run our case first, because
9 you don't seem to have a lot of time to run them.

10

11 (BRIEF PAUSE)

12

13 MS. MARLA BOYD: Are you able to
14 comment if we were to put the DSM in all of the -- the
15 plans, the -- the No Gen and -- sorry, in the Preferred
16 Plan and the All Gas, that they would -- they would
17 both improve?

18 MR. JOHN ATHAS: In -- on a cost side,
19 yes.

20 MS. MARLA BOYD: I'm sorry?

21 MR. JOHN ATHAS: From -- they would
22 both have lower costs.

23 MS. MARLA BOYD: Lower costs.

24 MR. RICHARD BEL: Can I ask what did
25 you mean by, It shows no penalty from delaying?

1 MR. JOHN ATHAS: Well, I -- I guess we
2 took from the scope of work, and I've seen this is in
3 other -- other jurisdictions as well -- where -- where
4 the -- as a matter of fact, it's corresponding to
5 legislation in -- in Connecticut for IRP, but it -- I -
6 - we took it as the -- that the -- because the -- the
7 scope of work item was to examine a case with gener --
8 with no new generation or generation significantly
9 delayed. I forget the actual choice of words.

10 So with that, it sounded to me like --
11 like -- because everyone is talking about putting in
12 generation, that maybe we -- that someone has the
13 perspective of -- that said, How bad would it be if we
14 didn't put in generation if we did everything else?
15 And that's kind of akin to the Connecticut legislation,
16 which says that IRP, which they had to do at the time,
17 had to consider a case where they put in as much DSM as
18 it took to -- to defer the need for generation past ten
19 (10) years.

20 They did not categorize it as being
21 limited by all economic on some screening testing or
22 anything, they just said, Tell us what this case looks
23 like. And -- and so -- and -- and there I get the --
24 you know, by definition, if you believe that the --
25 everything is nice and coordinated, and it -- and

1 you're -- that's asking for more DSM that might be
2 technically deemed economic, there -- in that case,
3 they kind of wondered about, How bad does it get if I
4 do that?

5 And so -- so that's why I said that the
6 -- there's a lot to be learned from our -- from a No
7 New Gen case. As Mr. Peaco explained, there's -- you
8 know, you can look at the value of the components, you
9 can look at the value of the components and then decide
10 that -- that maybe they should be in other plans, like
11 we're discussing here.

12 But they -- one (1) of the things it
13 says is that you -- that you -- even if you ended up on
14 a No Gen case and never pursued the hydros, you're
15 probably not exactly going down a bad path.

16

17 CONTINUED BY MS. MARLA BOYD:

18 MS. MARLA BOYD: If I could ask you to
19 turn to page 20 of our book of documents? This is
20 Slide 129 from Manitoba Hydro Exhibit 95, our direct
21 evidence, and it shows the benefits of DSM in various
22 plans.

23 MR. JOHN ATHAS: Yes.

24 MS. MARLA BOYD: Do you see that under
25 the Preferred Development Plan, there's a \$285 million

1 benefit going from base DSM to Level 1 DSM?

2 MR. JOHN ATHAS: That's correct.

3 MS. MARLA BOYD: And do you see that
4 there's a further \$737 million going from Level 1 DSM
5 to Level 2 DSM?

6 MR. JOHN ATHAS: That's correct.

7 MS. MARLA BOYD: So therefore, the
8 benefit of going from the base DSM to Level 2 DSM is
9 just over a billion dollars. Do you agree?

10 MR. JOHN ATHAS: The cost reduction is
11 that much. If you start to try to compare apples to
12 apples, and you want to put the -- put the -- the DSM
13 Level 2 into the -- into the All Gas case, I think the
14 numbers on this page say that the economics get worse.

15 MS. MARLA BOYD: Yes, the -- the All
16 Gas Plan, you could do the same thing, right, it's
17 there base to Level 1, five thirty-five (535), Level 1
18 to Level 2, eight sixteen (816)?

19 MR. JOHN ATHAS: That's right. That's
20 why I kind of -- in my frame of mind I like to think of
21 it as an isolation at lowered cost. If you put it in
22 the other case it reduced the -- it made it actually
23 less beneficial, or -- or potentially worse than the --
24 than the All Gas case. And that was -- that was one
25 (1) of the boxes that was used on the slide in our

1 presentation by -- by Mr. Peaco.

2 MS. MARLA BOYD: So if I look back to
3 page 19, your slide number 32, if the Preferred Plan
4 line were re -- redrawn to include the DSM benefits
5 that are in the No Gen case, that line would move up by
6 approximately a billion dollars, correct?

7 MR. JOHN ATHAS: No. It -- it goes --
8 the blue line goes down by \$329 million at the end
9 based on your own numbers, the one (1) on the page we
10 were just looking at. I can't tell you how the black
11 line moves because you didn't run that case. I can
12 tell you that the blue line versus All Gas moves down
13 by \$329 million.

14 MS. MARLA BOYD: And both of them would
15 be above the No Gen case?

16 MR. JOHN ATHAS: I don't know that.
17 Let's -- let me -- me be clear. You -- we talked about
18 how there -- the loads might be similar. Well, in the
19 2000 -- in the 2013 start analysis and other things,
20 some of that load -- well, in -- in our analysis we
21 kind of had to pay for all the load reduction. Some of
22 that -- some of the load reduction that's in the -- in
23 these analysis that you're referring to comes from
24 reduction in the load forecast for 213 -- 2013, so it's
25 free.

1 I don't -- that's why I don't think it's
2 apples to apples.

3

4 (BRIEF PAUSE)

5

6 MS. MARLA BOYD: The No Gen case on
7 slide 32 has the benefit of load reduction. We've
8 already reviewed that, correct?

9 MR. JOHN ATHAS: Has the benefit of
10 load reduction at a cost.

11 MS. MARLA BOYD: And if you were to
12 take the same load reduction into the Preferred
13 Development Plan at the costs that are shown on slide
14 129, it would move that line up \$1 billion relative to
15 the No Gen case, correct?

16 MR. JOHN ATHAS: I don't know that.
17 You -- you're asking me the same question about four
18 (4) different ways. The analy -- DSM by the -- if you
19 turn to your own page, right here, on page 20 of the --
20 of the document, you are demonstrating that DSM has
21 different effects on the cost reduction to different
22 plans.

23 And you're asking me to speculate on it
24 -- on how if you actually made a No New Gen case, a
25 2013 case, with Level 2 DSM and -- and so I didn't have

1 to pay for some of the load reduction because it --
2 because it came, I -- if the black line would be
3 identically to black line, I doubt it.

4

5 (BRIEF PAUSE)

6

7 MS. MARLA BOYD: If we were to work
8 with the All Gas Plan and to put the \$1.3 billion
9 that's shown in the move from the base to the Level 2
10 DSM on your graph, that would move the No Gen line and
11 the All Gas line closer together, correct?

12 MR. JOHN ATHAS: If the -- if I was
13 compar -- if the -- if you made the assumption that the
14 black line would be the No Gen case that would come out
15 of a 2013 analysis, even if I don't put the DSM in,
16 that's what -- that's what would happen.

17 But I don't -- but if I put the 2013
18 loads in, the first thing I'd have to do is take away
19 some of the DSM costs that were put in to get me the
20 load -- the cost reduc -- the load reduction.

21 MS. MARLA BOYD: You understand all
22 those costs are included in all of the figures that are
23 on page 20?

24 MR. JOHN ATHAS: Yeah. But I don't see
25 the All -- the No Gen case.

1 MS. MARLA BOYD: Okay. The No Gen case
2 is in the email that's on page 14 of our book of
3 documents. And it confirms that the No Gen case
4 includes the -- at line 13 of page 2 of 3 of the
5 response, includes the 2013 NFAT planning assumptions?

6 MR. JOHN ATHAS: Let me make sure I'm
7 looking at the right spot.

8 MS. MARLA BOYD: Sure. It's your
9 response to Manitoba Hydro LCA-16A. And you included
10 in that response the text of an email, which was the
11 confirmation of the planning assumptions included in
12 the No Gen case. And on line 13, page 2 of 3, the
13 assumption is the 2013 NFAT planning assumptions.

14

15 (BRIEF PAUSE)

16

17 MR. JOHN ATHAS: We went through -- we
18 went through a rather lengthy discussion in the first
19 week of December at the offices of Manitoba Hydro. We
20 wanted to see the -- the No New Generation case under
21 conditions of uncertainty that didn't exist in the 2013
22 assumptions.

23 So subsequent to this memo dated in
24 November we asked for the 2012-based analysis for No
25 New Generation under the twenty-seven (27) branches of

1 the uncertainty analysis that was done.

2 I know at that -- one point in that
3 discussion I said, I don't really care how you estimate
4 the loads, if you start from a 2013 number or other
5 stuff, but I want -- we want the 2012 uncertainty
6 analysis. And we -- we were under the assumption that
7 that's what we got because we didn't see -- we've never
8 seen a 2013 vintage uncertainty analysis.

9 So we didn't think that you -- that it
10 was created specifically for the -- for the purposes of
11 this. If it's -- if it's still -- if we were still
12 delivered an analysis under 2013 assumptions, then
13 we've been mislead.

14 MR. CHRISTIAN MONNIN: Ms. Boyd, I just
15 -- I'm sorry for introduce -- sorry, interrupt your --
16 at quarter to 5:00, but your document, slide 129, page
17 20, which you're putting to -- to the witness, I'm just
18 curious if that include -- that's right, yes.

19 And I apologize if this has been out
20 there already, but does this include the updated
21 capital costs?

22 MS. MARLA BOYD: Yes, I'm advised it
23 does.

24

25 (BRIEF PAUSE)

1 CONTINUED BY MS. MARLA BOYD:

2 MS. MARLA BOYD: So before I leave
3 slide 32 of your presentation I want to talk about the
4 third adjustment that was made. That No Generation
5 case includes the relaxation of the dependable energy
6 import planning criteria by increasing the reliance on
7 imports to 20 percent of Manitoba load rather than 10,
8 correct?

9 MR. JOHN ATHAS: Yes. Yes.

10 MS. MARLA BOYD: And you're aware of
11 Manitoba Hydro's view on that. But would you agree
12 that, if that were done, hypothetically, that the
13 Preferred Plan economics would improve relative to the
14 No Gen case if it also included a relaxation of the
15 import criteria?

16 MR. DANIEL PEACO: I don't think we
17 know that. The planning is just designed primarily for
18 export. It's not clear how much impact that would have
19 on the case.

20 MR. JOHN ATHAS: One (1) of the
21 questions that we'd need to know, are you going to move
22 -- are you -- change the timing of any of the -- of the
23 other generation additions in the Preferred Plan or
24 roll with them as they were. If it's roll with them as
25 they were, I don't think it changes anything.

1 MS. MARLA BOYD: Well, it's a
2 hypothetical because Manitoba Hydro, of course, does
3 not view relaxing the imports to 20 percent as an
4 appropriate thing.

5 But regardless of that, the plan as it's
6 laid out here would have all of the benefits that you
7 talked about in your evidence, right? We'd be able to
8 sell more energy at long-term firm price?

9 Do you agree?

10 MR. JOHN ATHAS: Yes. You'd -- you'd
11 be able to sell -- you'd have additional -- after the
12 trans -- after the constraint was changed, the criteria
13 was changed, you'd have additional dependable energy so
14 you'd sell more energy under firm contracts or short-
15 term firm contracts.

16 MS. MARLA BOYD: And we'd be able to
17 import instead of running Brandon or Selkirk under low-
18 flow conditions?

19 MR. JOHN ATHAS: I think we testified -
20 - we had a lot of discussion about how in prior -- in
21 prior cross-examination by your -- by your earlier
22 colleague that said changing the criteria does not do
23 anything to change the operation, so that I don't think
24 it would have any change at all to whether you wanted
25 to import at low -- low-flow conditions.

1 We're talking about having the same
2 hardware in fact and changing the planning criteria.
3 So I think the change is zero.

4 MS. MARLA BOYD: And the planners would
5 assume that they could run Brandon and Selkirk under
6 low flows instead of -- I'm sorry, that they could
7 import instead of running Brandon and Selkirk under low
8 flows.

9 MR. JOHN ATHAS: I believe that -- that
10 SPLASH would do a pretty good job of determining
11 whether it should import or -- or run Brandon. And I
12 believe that in -- that in the short term, the
13 operating people probably do the same kind of -- just -
14 - questions.

15

16 (BRIEF PAUSE)

17

18 MS. MARLA BOYD: Are we clear that in
19 relaxing these criteria in this hypothetical, that the
20 SPLASH model would be modified to relax the criteria to
21 20 percent? I just want to make sure we're on the same
22 page.

23 MR. JOHN ATHAS: And -- well, let me
24 just explain how I think it probably works. The
25 criteria would change in the SPLASH model. I believe

1 that in an instance of a low flow -- of a drought
2 calculation, that the -- well, you posed the example:
3 Would that -- would that allow -- would the change in
4 criteria allow more imports instead of running Brandon
5 at low -- at low flow?

6 My understanding from the points being
7 made by -- by your attorney earlier today was to make
8 sure that it was clear to everybody in the room that
9 that's only a planning decision criteria to see what
10 hardware gets bou -- or what gets put in place, and
11 that the actual operation would not be affected by the
12 20 percent criteria.

13 So for that element of the question that
14 you asked, I think SPLASH would come up with the same
15 answer.

16 MS. MARLA BOYD: So what we're looking
17 at is what happens in the evaluation. And the question
18 -- my question to you was not, What would they do
19 operationally but would -- if you relaxed that
20 assumption, would the Preferred Development Plan also
21 benefit from that relaxation in the same way that the
22 No Generation case benefited in the evaluations?

23 MR. JOHN ATHAS: It -- it depends on --
24 depends on what capital changes you make for this
25 assumption, and it -- and to say benefits are the same,

1 it -- when there's a different set of resources, just
2 like we see in DSM, the next resource that you add has
3 -- has different effects from -- depending on the
4 starting point.

5 So I -- it won't be the same. I have --
6 I don't know whether it will be close, but it won't --
7 by definition, it will not be the same.

8 MS. MARLA BOYD: Would you accept that
9 the Preferred Development Plan would also benefit from
10 the other benefits that you looked at with the No Gen
11 case, that the imports could be used instead of running
12 gas turbines, that you'd defer the in-service date of
13 Conawapa, and that you'd import more for export and
14 take advantage of the arbitrage potential?

15 MR. JOHN ATHAS: Sounds like a really
16 good idea. Glad you thought of it.

17 MS. MARLA BOYD: The question, though
18 is: Would the Preferred Development Plan benefit in
19 the same way as the No Gen case?

20 MR. JOHN ATHAS: I don't know. I
21 haven't moved -- I didn't move a hydro plant around in
22 the No Gen case.

23 MS. MARLA BOYD: Could I have slide 37
24 of LCA Exhibit 45, please. Slide 37.

25 I understand that your evidence was that

1 you created an approximation of a scenario in which the
2 in-service date for Keeyask is delayed five (5) years.

3 Is that right?

4 MR. DANIEL PEACO: That's correct.

5 MS. MARLA BOYD: And you called this
6 plan '2A' in your description?

7 MR. DANIEL PEACO: Yes.

8 MS. MARLA BOYD: And according to your
9 evidence at transcript page 5640, you concluded that on
10 the 2012 reference case basis the net present value of
11 Plan 2 and 2A were exactly the same, so it really had
12 no cost effect overall on the plan if you did that.

13 Do you recall that?

14 MR. DANIEL PEACO: I do.

15 MS. MARLA BOYD: Have you reviewed
16 Manitoba Hydro's response to LCA Manitoba Hydro 1-336?
17 Could I ask that we have that brought, please? LCA
18 Manitoba Hydro 336. First round.

19

20 (BRIEF PAUSE)

21

22 MS. MARLA BOYD: It's 336, sorry.

23 This is an Information Request that you
24 posed to Manitoba Hydro asking for documentation and
25 analysis related to our evaluation of a gas Keeyask

1 Development Plan.

2 Do you recall that?

3 MR. DANIEL PEACO: Not in particular,
4 but...

5 MS. MARLA BOYD: I take it that means
6 you didn't review our response?

7 MR. DANIEL PEACO: No, it's been --
8 I've reviewed a lot of responses, so.

9 MS. MARLA BOYD: It just didn't stick
10 in your mind.

11 MR. DANIEL PEACO: I don't have the
12 entire case committed --

13 MS. MARLA BOYD: Fair enough.

14 MR. DANIEL PEACO: -- to memory.

15 MS. MARLA BOYD: Neither do I.

16 MR. DANIEL PEACO: And I don't have it
17 -- don't have the memory of the -- the numbers
18 correlating with the information either, so.

19 MS. MARLA BOYD: Could we go to page 2
20 of this response, please? That's good.

21 Manitoba Hydro's evidence in that
22 response is that advancing Keeyask ahead of gas -- so
23 Keeyask 22 gas, is favourable to the gas first plan
24 which puts gas in 22 and Keeyask in 28, with an
25 incremental MPV that's \$178 million higher.

1 Do you see that?

2

3

4 (BRIEF PAUSE)

5

6 MR. DANIEL PEACO: I see that.

7 MS. MARLA BOYD: And do you accept

8 Manitoba Hydro's conclusion that the difference between

9 those plans is 178 million?

10 MR. DANIEL PEACO: Well, we never

11 received the case behind that, so far as I know.

12 MS. MARLA BOYD: Do you have any reason

13 to dispute it?

14 MR. DANIEL PEACO: I don't, but I just

15 -- we haven't see -- we have -- we weren't provided

16 with the backup for that case.

17 MS. MARLA BOYD: And this would suggest

18 that there is an economic penalty for delaying Keeyask,

19 correct?

20 MR. DANIEL PEACO: \$178 million is --

21 that would be more or less consistent with our result;

22 that's a fairly small change.

23 MS. MARLA BOYD: But it is a change;

24 it's not exactly the same?

25 MR. DANIEL PEACO: Right.

1 MS. MARLA BOYD: Mr. Chair, I have
2 another area to go through that I fear is going to be a
3 little bit of a tough sled, to be perfectly candid. It
4 is five to 5:00. I'm wondering if you'd prefer that we
5 adjourn now and do that in the morning or if you'd like
6 to carry on?

7 THE CHAIRPERSON: Can you give us an
8 estimate of how long you would take?

9 MS. MARLA BOYD: I'm going to guess
10 about thirty (30) minutes.

11 THE CHAIRPERSON: I think we'll do it
12 tomorrow morning. We had committed to leaving -- to
13 finishing today at five o'clock. So yeah, it would be,
14 I think, more appropriate to start tomorrow morning.

15 I'm starting to wonder -- I'm starting
16 to wonder whether we have enough hours in the day
17 tomorrow to do all that needs to get done. And I
18 wonder if it would be appropriate to consider an early
19 start tomorrow morning given -- given the time
20 constraints that we're facing and the amount of
21 information we're trying to get into that time
22 constraint.

23 MR. CHRISTIAN MONNIN: I can advise
24 that Mr. Peaco believes he'll need about thirty (30)
25 minutes for his direct presentation on CSI, and then I

1 believe Mr. Peters has an idea of what he'll be doing -
2 - the time he'll require for the public cross. And Ms.
3 Boyd has said about thirty (30) minutes for cross and
4 I'm not sure about the CSI cross, however.

5 THE CHAIRPERSON: Mr. Peters, can you
6 give us the benefit of your wise counsel?

7 MR. BOB PETERS: Someone earlier today
8 said don't do math on the public transcript and
9 probably sage advice. But if I'm hearing Ms. Boyd is
10 taking thirty (30) minutes today, I'm going to want
11 between one (1) and one and a half (1 1/2) hours
12 tomorrow. So if we say that'll take us to 11:00, and
13 then the direct evidence would be done before noon by
14 Mr. Peaco on the CSI. I have yet to hear from Ms. Boyd
15 or Ms. Murphy for sure how long they would want in the
16 afternoon on their cross-examination in the CSI room.

17 MS. MARLA BOYD: I can't resist telling
18 you that Ms. Murphy has left the building, but Ms. Boyd
19 can tell you that we expect that our CSI will be short.
20 It should be about thirty (30) minutes.

21 MR. BOB PETERS: Having heard that, we
22 should be able to complete by 4:30 tomorrow.

23 THE CHAIRPERSON: So there's no need
24 for an early start tomorrow morning?

25 MR. BOB PETERS: I'm not against it,

1 but it's up to the parties here as to whether we want
2 to -- we may as well if -- if the parties are
3 agreeable, let's start early. Well, hang on, Mr.
4 Williams...

5 MR. BYRON WILLIAMS: No, I have
6 something on a different issue, so I'll wait until this
7 discussion's ended.

8 THE CHAIRPERSON: But my impression is
9 that we could start at 9:00 and still finish within the
10 time frame of 4:30?

11 MR. BOB PETERS: Yes, sir.

12 THE CHAIRPERSON: Okay. So that --
13 let's -- let's work with that plan. And, Mr.
14 Williams...?

15 MR. BYRON WILLIAMS: Yes, and I just --
16 we're -- we're looking at CAC(Manitoba) towards next
17 week. And I think it's our understanding that the IEC
18 Knight Piesold has provided some additional evidence
19 this morning to Hydro. And we were just hoping we
20 could get an update on the scheduling of when it will
21 be available to be shared with -- with other parties so
22 that we can schedule our -- our weekends around it, no
23 doubt.

24 But it would be helpful just to know
25 when we might receive it.

1 MS. PATTI RAMAGE: Mr. Chair, I'm not
2 sure how much we can help Mr. Williams. We got that
3 this morning. It's been sent to the team for CSI
4 review with the request it be done as fast as possible.
5 And they're pretty good, but I -- you know, I don't
6 know what's there and that's the challenge, is if they
7 find nothing they're really quick. If they find
8 questions it -- it takes longer to work through it.

9 MR. BYRON WILLIAMS: Perhaps we could
10 have an update as we get towards the end of the week.
11 I'll be out of province, so we may have to make
12 alternative arrangements for delivery of the material,
13 so.

14 THE CHAIRPERSON: Thank you. I don't
15 know if there's anything else to get -- to address
16 today. If not, we're adjourned and we'll see each
17 other again tomorrow morning at nine o'clock. Have a
18 good evening, everyone.

19

20 (PANEL RETIRES)

21

22 --- Adjourned at 5:00 p.m.

23

24

25

1

2 Certified Correct,

3

4

5

6

7 Ms. Cheryl Lavigne

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

<u>\$</u>	<u>1</u>	6289:3,4,1	6071:11	6113:19,24
\$1 6304:14	1	1	6078:20	6114:4,16,
\$1,500	1	6290:2,14	6079:13	21 6115:2
6238:8	6018:10,16	6291:2	6317:11	10th 6285:19
\$1,700	,21	6294:25	1:00 6132:21	6287:13
6239:7	6028:13	6301:12	1:01 6147:20	11 6036:12
\$1,750	6031:9	6302:1,4,1	1:07 6147:21	6137:2
6235:6	6032:7	7,25	10 6052:4	6148:13
6239:11	6054:6	6303:9	6053:14	6188:1
\$1,760	6057:4,23	6308:20	6062:18	6250:20
6236:24	6061:9	6317:11	6083:10	6261:14
\$1.3 6305:8	6063:4,5	1,000	6106:24	6264:25
\$1.7 6042:20	6064:5,7	6210:18	6114:2	6275:23
\$178 6314:25	6069:22	1,050	6154:25	11,000
6315:20	6070:2,9,1	6035:18	6155:13	6226:18
\$2 6260:11	8,19	1,085,000,00	6157:19,20	6227:7
\$2,100	6071:11	0 6035:14	6159:20,22	6228:6,12
6231:8,17	6078:20	6036:17,20	,24	11:00
6232:6	6079:13	1,155,000,00	6160:1,5	6317:12
\$2,200	6080:23	0 6035:19	6163:3	11:30 6103:9
6233:1,8,2	6081:14,19	6036:21	6164:21	6112:23
4	6085:4	1,177	6174:24	11:55 6133:3
\$2,400	6087:10	6202:8,21	6175:4,6	1-11 6168:24
6230:6,17,	6091:6,9	6203:18	6176:1	1-127
23 6231:6	6092:12	1,500	6198:9,19	6276:14
6233:23	6097:25	6238:11	6203:3,8	114 6060:25
6235:23	6098:22	1,696,000,00	6214:14	116 6061:3
6238:9	6100:7	0 6034:18	6219:11,17	12
\$285 6301:25	6101:4	1,750 6236:7	6284:13	6018:15,17
\$329	6148:9	6239:6	6300:19	,21
6303:8,13	6150:12	1,826	6308:7	6161:1,9,1
\$737 6302:4	6152:6,7	6240:17	10:30	7
\$80 6136:19	6160:6,21	1,850	6083:12	6174:8,17,
\$898	6162:9	6262:15	10:46	19 6175:11
6039:14,17	6163:9,20	1.196 6294:1	6083:13	6176:1
\$900 6043:22	6165:3	1.36 6283:6	6154:14	6262:10
	6166:20	1.5 6087:1	6189:18	6277:4
	6169:7	6207:7	6244:15	6280:22
	6171:25	1.696	104 6149:22	6294:5
	6186:1,4	6292:18	104-10	12:45 6133:4
	6192:13,16	1.9 6285:20	6149:20	12-1 6029:21
	6194:22	1.913	104-8 6020:3	126 6276:16
	6196:24	6285:20	6037:4	129 6301:20
	6199:13	1/2	6051:9	6304:14
	6238:25	6064:2,3,4	108 6060:25	6307:16
	6247:4	,6 6070:19	10A	13 6084:3
<u>0</u>	6249:4,10,		6084:3,25	6099:6
043 6255:8	25 6251:8		6103:13	
043a 6255:3	6253:20			
073c	6256:13,14			
6255:3,9,1	6264:12			
5	6271:13			
	6272:6			
	6280:2			

6103:12	167-1		6281:21	2000 6303:19
6115:2	6150:12		6283:18	2007 6243:18
6237:17	167-2	2 6018:16	6285:8	2008 6276:21
6238:12	6150:13	6020:18	6286:18	2011 6251:4
6306:4,12	167-3	6021:21	6290:1	2012 6034:2
1-336	6150:19	6024:8	6294:19,21	6048:20
6313:16	17 6035:2	6025:17	6295:19,24	6051:1
13th 6232:1	6036:13	6051:10	6296:17	6141:15
14 6022:9	6070:13	6053:23	6302:5,8,1	6187:13
6025:1,7,8	6073:1,17	6060:25	3,18	6198:11
6026:8	6080:9	6061:8,14	6304:25	6220:11
6034:12	6086:25	6063:3,12	6305:9	6234:23
6036:16	6118:1,3	6069:16	6306:4,12	6236:8
6069:4,5,1	6125:9	6070:25	6313:11	6238:1
4,18	6127:18,24	6071:14	6314:19	6240:12,17
6085:11,12	6128:19,24	6072:19,20	2(I 6042:23	6241:22
,13	6130:10,18	6073:15	2,354 6202:7	6243:19
6166:10,16	6157:18	6082:15	2.3 6276:11	6255:4,10
6173:15,24	6163:9,21	6085:15	6280:21	6257:20
6179:13	6262:11	6087:10	2.4 6282:7	6294:20
6238:14	6276:20	6092:17	6283:5,8,2	6295:14
6306:2	178 6315:9	6094:20	5	6307:5
14a 6236:6	18 6215:25	6098:22	2.5 6283:24	6313:10
15 6134:4	6227:19	6107:10,24	2/3 6172:22	2012-based
6207:25	6296:9	6108:1	2:21 6214:17	6306:24
6277:21	1-8 6190:5	6117:9	2:27 6214:16	2013 6188:9
6278:2	6191:13	6126:3	20 6051:22	6189:25
150	6192:14,16	6129:23	6052:7	6191:25
6206:2,18,	186 6265:3	6130:16	6053:12	6192:1,2
22,25	19 6229:19	6132:7	6056:13,14	6217:12
6207:12	6243:8	6134:5	6095:21	6220:2,8
6294:10	6266:18	6141:14	6096:6,21	6221:4,12
154 6034:25	6296:25	6147:18	6103:13	6232:2
6036:22	6303:3	6152:5	6117:5,7	6251:4
6039:18	1908 6135:24	6154:20	6126:17	6281:21
1-57 6186:16	1913 6287:15	6160:19	6132:21	6294:24
6194:9	1921 6137:3	6164:25	6182:12	6295:11,14
16	1930s	6167:20	6205:11,19	,23
6069:8,14,	6243:25	6180:3,7	6249:22	6296:22
20,21	1940s	6181:15	6250:2	6303:19,24
6099:6	6243:25	6183:21	6278:4	6304:25
6166:16	1982 6139:5	6199:11	6301:19	6305:15,17
6180:3	1990s	6201:12	6304:19	6306:5,13,
6274:1	6139:21	6202:6	6305:23	21
166	1c 6231:5	6206:4	6307:17	6307:4,8,1
6148:10,15		6233:5	6308:7	2
167 6150:5		6240:9	6309:3	2013/'14
6264:10		6248:5	6310:21	6222:8
		6249:23	6311:12	6225:9
		6252:23,24		2014 6014:24
		6253:21		
		6256:9		
		6264:11		
		6278:20		

6048:21 6266:5 2016 6166:3 2016/'17 6167:6 6180:6,11 2017 6170:8 6179:5 2019 6099:18 2020 6260:15 2023/'24 6218:6,10 6221:7 2026/'27 6218:14 2029 6118:6,12, 15 6123:9,13 6125:23 6205:9,17 2030/'31 6222:9 2031/'32 6217:20 2032 6085:2,18 2046/'47 6219:21 6221:14 6225:16 6227:8 6228:16,23 6229:9 2047 6228:3 2062 6086:9 20th 6191:24 6192:2 21 6126:1 6169:24 213 6303:24 22 6018:14,18 ,20 6104:7 6178:11,13 6203:12	6257:9 6314:23,24 22,754 6180:16 6181:2 23 6178:17 6191:18 6236:11 6237:21 6238:12 235 6240:19 24 6109:2 6115:3 6159:7 6219:3 6233:16 6237:6,15 6269:20 6273:14 24,120 6200:19 24,961 6201:18 25 6121:14,16 6199:6 6201:13 6250:25 6270:6 25,489 6201:5 25,882 6200:5,15 6201:4 25,960 6167:13 6174:6,12 6180:9 250 6021:9 6086:16 6089:19 6092:5,18 6093:11 26 6025:3 6125:16 6198:9,22 6229:21 6230:19	6252:17 27 6020:20 6080:15,16 6081:9 6085:10,16 6086:12 6276:16 6288:21 6306:25 28 6188:2 6190:12 6229:22 6314:24 29 6252:14 6294:6 2A 6313:6,11 <hr/> <div>3</div> <hr/> 3 6018:16 6031:17 6032:1,15, 17 6044:1 6045:11 6051:10 6056:19 6057:12 6069:2 6070:5 6071:3,7 6075:1 6087:10 6116:8 6134:10 6135:16 6140:8,11 6150:2 6152:7 6165:2,16, 19 6199:10 6205:7,23 6230:19 6231:15,16 6250:18 6251:4,19 6253:15,20 6265:1,25 6306:4,12 3,000 6188:17 6189:17 6223:12	6226:16,22 6227:1,4 3,068 6168:18 6173:21 6174:5,8,2 3 6175:3,10 6221:18 6222:22 3,069 6174:11 3.35 6276:6,10 3:44 6263:21 3:52 6263:22 30 6051:22 6052:7,25 6053:13 6060:17 6095:22 6138:3 6183:15 6225:8 6241:11 6252:14 6254:5 6276:16 6316:10,24 6317:3,10, 20 30,000 6223:10 6225:22 30,808 6180:11 6181:1 30th 6281:21 31 6126:23 6183:13,15 6184:17,22 6240:23 3-1 6042:22 6094:16 6108:21 6116:8 31st 6266:4 32 6116:9	6297:1 6303:3 6304:7 6308:3 3-2 6105:12 32,000 6187:16 326 6121:14 3-26 6123:2 33 6278:25 6279:1 330 6014:22 336 6313:18,22 34 6243:20 6244:10 35 6229:20 6230:11 6268:1,6 6272:16 6277:22 6278:4 358 6254:14,19 6255:18 37 6236:11 6237:5 6241:18,22 6242:10 6312:23,24 37,500 6225:17 38,500 6225:8 3A 6126:1 3B 6121:14,16 6125:17 6126:23 3C 6169:7 <hr/> <div>4</div> <hr/> 4 6026:12 6029:2 6044:2 6045:11
--	---	---	--	--

6064:2	6132:20	6052:24	6198:11,18	6014 6014:25
6086:16	6312:24	6070:19	,21 6237:4	6017 6016:3
6090:5	46 6084:25	6086:6,8	5-7	6019
6092:12,25	47 6216:1,9	6095:19,22	6243:9,17	6017:3,4
6168:25	48 6182:25	6096:21	58 6241:14	6020 6016:10
6199:9	6241:5	6116:3,4	5-8 6245:5	6017:5,6,7
6206:4	48,200	6160:11	6246:18	,8,9,10,11
6240:5	6181:17	6230:10,15	58,000	,12,13,14
6282:4	49 6227:18	,17	6167:8	61 6084:3
6283:21		6241:11	58,874	6-1
6284:8,9		6268:1	6167:6	6121:15,16
6290:4		6277:21	6175:16	6125:17
6304:18		6278:3,9,1	6180:6	6126:24
4,000	<hr/> 5 <hr/>	0 6279:11		
6136:18	5 6027:12	50/50	5862 6285:22	6113 6016:11
4,100	6029:2	6033:5,8	6286:1	6117 6016:12
6168:15	6064:3	6040:2	59 6068:13	6133 6016:14
6170:10,14	6091:5	6061:15	6078:17	6017:15
6171:20	6106:23	6063:11	6081:3	6149 6017:16
6172:3	6130:12	50:50 6037:1	6241:14	6150 6017:18
6173:1,4,6	6131:2	6278:14,21	5th	6151 6016:20
6175:15,17	6136:11	6280:12	6255:4,10	6017:21,22
6176:2	6137:10,25	500 6087:22	6257:20	6152 6017:23
6179:3,18	6148:14	6088:15	<hr/> 6 <hr/>	6250 6016:21
6182:5	6149:7	6089:6	6 6020:6,7	6264 6016:22
6187:1	6163:25	6212:10,17	6021:12,21	6320 6014:25
4.4 6104:9	6177:19	6251:25	,23 6025:1	6016:24
4:30 6215:15	6203:3,8	51 6191:11	6027:12	67 6095:2
6317:22	6242:21	6230:18	6042:6	6097:6
6318:10	6263:18	5-10 6245:5	6047:20	6284:12
40 6116:4	6282:4,6	5-11 6245:6	6078:6	69 6277:4
6141:10	6283:23	5-13 6245:6	6112:13,14	6280:18,22
6144:23	6287:2	5-14 6243:1	,16 6126:1	6281:8
6242:7	6313:2	6245:6,10	6170:1	6A 6098:5
400 6014:22	5,000	52 6231:3,15	6177:19	6th 6189:25
41 6175:20	6188:22	5-29 6245:10	6186:6,8,1	6191:25
42 6237:25	6189:11	53 6166:20	0 6188:9	6192:1
6238:25	5,669	535 6302:17	6194:7,8	
43 6242:4	6289:6,24	54 6236:5	6294:4	<hr/> 7 <hr/>
44 6199:5,25	5,731	5567	6,000	7 6042:6
6222:13	6152:21	6286:3,12	6228:24	6051:10
44,100	5:00 6215:2	6287:14	6,443	6064:4
6170:6	6307:16	56 6187:5,8	6227:24	6086:12
6182:1	6316:4	6236:16	6228:11	6105:13
45 6068:12	6319:22	5640 6313:9	60 6051:16	6108:22
6078:17	50 6030:22	57	6056:2	6166:7
6081:3	6031:3,4		6057:10	
6085:7	6038:25		6240:3	
	6039:1			
	6040:10,16			
	,17,22			
	6051:16,18			

6173:15,24	8 6043:22	6038:3	6076:5	6203:6
6175:17	6052:4	90th 6285:21	6079:18	6208:12,19
6179:16,18	6165:3	6287:14	6110:2,10,	,23 6209:6
6180:2	6169:4	9-178 6040:6	22 6111:15	6233:7
6184:8,11,	6176:12	92 6236:10	6119:19	6252:6
13,23	6182:12	6276:3	6149:5	6265:21
6239:8	6186:7,10,	920 6201:2	6238:16	6312:8
6240:18	12 6194:7	921 6200:21	6260:22	6315:7
6283:23	6250:19,25	6201:9,21	6261:18	access
7.05 6103:21	6254:4	95 6260:4	6269:5	6022:10
6104:20	6259:7	6286:8	6299:13	accessed
70 6035:21	6261:9,14	6301:20	6309:7,11,	6214:9
6036:15,19	8,000	95th 6286:2	16 6317:22	accessible
700 6219:2	6223:21	99 6244:6,10	Aboriginal	6144:1
750 6021:8	6224:18,20	9A 6052:13	6113:15	accommodate
6022:16	6226:11	6060:24	6134:9,23	6208:4
6025:15	8,054	6061:4	6135:9,13,	accompanied
6027:1,14	6180:25	6062:4	17 6136:13	6139:25
6073:11,12	6181:7	6063:10	6138:12,13	accomplished
6078:1,6	80 6237:9	6113:19,22	6139:1,6	6112:2
6087:22	81 6262:10	6269:20	6140:4,9	6143:12
6088:14	816 6302:18	6273:15	6143:9	according
6089:20	82 6260:4	6274:1	6146:9	6036:3
6093:23	8-23 6259:7	6276:3	above-	6167:4
6118:3	85 6262:10	9B 6029:20	average	6187:12
6121:21	6265:2	6038:3	6244:17	6313:8
6122:22	6276:16	6056:1	abs 6096:15	accordion
6123:8	857 6261:16	9B-90 6040:4	absence	6150:21
6205:9,17	8-57 6261:9	6042:3	6106:6	account
6207:18	87 6257:14	9U 6052:14	absolute	6239:19
6212:24	882 6201:15	_____	6215:11	accounts
6258:23	89 6029:22	A	6277:11	6148:14
78 6039:15	_____	a.m 6018:1	absolutely	6245:10
6080:1	9	6083:12,13	6096:15	accurate
6094:14,20	_____	6133:3	6142:13	6026:16
6095:23	9 6014:24	abil 6156:19	6143:13	6113:24
6096:2,24	6094:17	ability	6283:10	6251:14
6097:8,21	6169:23	6032:15	abstraction	6259:17
6268:3	6175:21	6106:21	6134:18	achieve
6270:13	6178:16	6261:24	aca 6265:6	6228:7
6271:16	6292:12	6279:5	accept	achieved
6273:8	6293:21	able 6024:11	6082:14	6205:7,15
6277:2	9.3 6279:23	6025:16	6163:17,21	acknowledge
6281:5	9.7 6104:9	6027:19	6167:15,17	6018:6
6297:24	9:00 6018:1	6039:21	6180:10,18	6137:25
79 6017:16	6318:9	6050:2	6181:15,16	6197:17
6148:11,17	90 6033:25	6061:12	6182:2	acknowledged
7a2 6207:24			6185:12,16	
_____			6187:10,17	
8			6202:19	

6177:21	6275:2	6318:18	6125:21	Advisory
acknowledging 6084:4	6286:1	additions	6234:20	6188:7
acronym	6287:1	6069:23	6294:18,19	AESC 6283:6
6169:11	6288:15	6073:15	Administration 6165:6	affect
across	6302:22	6107:1	admits	6143:20
6085:15	6304:24	6240:16,18	6141:20	affected
6086:11	add 6075:7	6308:23	ado 6133:10	6034:16
6111:13,17	6148:13	address	adopt	6138:6
6156:16	6268:2	6072:21	6030:12	6141:5
6291:17	6312:2	6143:4	advanced	6142:10
act 6161:9	added	6145:14	6248:15	6143:21
acting	6022:10	6215:5	advancing	6311:11
6133:12,18	6036:18	6319:15	6297:6	Affirmed
actual	6073:11	addressed	6314:22	6016:6,7,8
6115:6	addendum	6135:11	advantage	,17,18,19
6138:25	6038:14	6267:11	6023:5	6019:22,23
6160:11	6050:4	addressing	6046:14	,24
6243:6	6051:2,4	6134:14	6110:5	6151:16,17
6300:9	6052:13	Adequacy	6116:14	,18
6311:11	6062:5	6188:7	6124:13	afford
actually	adders	adequate	6153:14	6272:23
6035:17	6060:17	6048:23	6312:14	6273:1
6045:16	adding	6162:12	advantages	afternoon
6058:15	6121:21	6178:23	6021:15	6133:6,8
6060:21	6122:22	6261:19	6251:10	6147:23
6074:15	6130:19	adhesion	advice	6148:3,6
6077:22	6222:25	6135:23,25	6100:12	6151:4,21
6080:6	6224:13	6136:1,4,1	6266:1	6152:2
6082:17	addition	0	6317:9	6227:1
6084:2	6021:9	adjacent	advise	6250:8,10
6085:6	6131:12	6256:15	6079:19	6264:4,5,9
6096:1	6207:13	adjective	6185:8	6317:16
6112:12	6222:23	6100:20	6215:6	against
6114:5	6226:15	adjourn	6290:10	6160:24
6118:14	6240:11	6132:22	6316:23	6197:3,9,1
6138:8	6254:8	6316:5	advised	9 6198:4
6139:16	additional	adjourned	6192:3	6317:25
6142:16	6022:19	6319:16,22	6307:22	ago 6089:16
6143:4,19,20	6025:22	adjudicated	advisement	6141:15
6150:23	6038:14	6141:1	6038:1,6,7	6144:23
6151:23	6060:1	adjusted	6082:16	6171:2
6152:22	6124:1	6296:13	advises	6182:12
6156:25	6127:9	adjusting	6232:13	6249:22
6157:5	6199:11	6032:25	advisors	6263:7
6225:21	6207:20	adjustment	6064:9,11	agreeable
6226:3	6258:16	6308:4	6101:17	6318:3
6231:24	6259:24	adjustments		agreed
6255:13	6260:22			6171:2
6258:20	6267:13			6174:23
	6309:11,13			

agreement 6042:11,14 6137:17,18 19,21 6139:3,4,1 5,23 6140:3 6154:11 6214:8 6262:12,13	6053:24 alone 6073:13,18 already 6022:21 6058:24 6075:11 6086:25 6093:21 6097:24 6120:24 6138:22 6181:25 6185:19 6186:24 6243:2 6248:11 6264:8 6279:2 6304:8 6307:20	6151:5,11 6172:18 6187:2 6188:13 6194:15 6201:3,7 6210:15 6215:1,3 6244:4 6250:17 6264:19 ambi 6102:20 ambiguity 6102:20 amendment 6139:19 6140:1 American 6213:9 among 6138:16 6143:20,25 6196:8 6259:15,16 amongst 6115:18 6196:16 6214:2 amou 6157:23 amount 6048:16 6071:16 6075:10 6084:5 6086:23 6111:15,24 6130:19 6153:6 6157:24 6164:23 6169:14 6172:6 6174:21 6181:8 6222:23 6225:20 6316:20 amounts 6091:11 6093:9	6121:24 6123:1 6176:24 analogy 6160:14 analy 6234:6 6279:25 6304:18 analys 6032:6 analyses 6061:1 6190:12 analysis 6021:2,4 6022:7 6030:2 6031:9,20 6032:6,8,2 5 6033:9 6038:9 6044:23 6046:1,13, 20 6047:11,23 6048:8,20 6049:25 6051:1 6052:23,24 6054:1,5,2 1 6056:3 6058:5,19 6059:24 6060:1,8,1 6,19,22,23 6061:15 6062:12 6063:9,19 6064:17 6065:2,4,7 ,8 6066:9,22 6067:13,17 6075:1 6078:11 6079:21 6090:5 6094:15,21 6095:6 6097:18 6098:3 6101:22	6102:5,16 6103:11,20 6104:13,23 ,25 6105:17,21 6107:25 6108:6,23 6110:10,23 ,24 6111:12 6112:20 6114:3,15 6116:2,13 6124:4 6127:24 6148:14 6149:8 6164:22 6206:1 6207:2 6232:8,17, 18,25 6233:5,15, 18 6234:6 6242:10 6245:9 6247:18 6248:4,15 6266:23 6268:4 6269:8 6270:1,9 6271:4,14, 25 6272:19,23 ,25 6273:22 6274:4,24 6275:5,11, 12,19 6276:1 6277:13 6279:8,19, 22 6280:5 6284:10,25 6285:1 6288:11 6291:14 6292:11 6295:14 6299:5 6303:19,20 ,23 6305:15
agreements 6139:21,25 ahead 6088:6,10 6131:9 6137:5 6159:8 6222:10 6299:7 6314:22 akin 6300:15 alleviate 6091:9 6092:21 allocated 6090:21 allow 6123:22 6157:25 6205:10,19 6311:3,4 allowance 6179:3 6182:17 allowed 6158:9 allowing 6123:24 6158:2 6182:24 allows 6124:13 6141:19 6152:25 6179:22 6185:19 6259:13 alluded	alternative 6106:8 alternative 6044:15 6060:14 6073:18 6087:25 6106:20,22 6107:3 6110:25 6125:19 6127:25 6128:8 6265:5 6287:19 6319:12 alternatives 6014:8 6075:2 6087:25 6110:24 6284:10 6285:8 6286:18 6290:11 am 6026:13 6059:14 6093:11 6124:6 6133:18			

6306:24	6102:1	6039:25	6104:4,14,	6307:19
6307:1,6,8	6107:19	6040:1,12	19 6105:8	appalling
,12	6113:2	6041:8,9,1	6106:10,18	6141:15,16
6313:25	6114:12	7,18	,19	apparently
analytical	6116:25	6042:1	6107:9,16,	6018:6
6195:10	6129:24	6043:11,14	18,19	6253:13
6279:25	6201:25	,17,24	6108:2,9,1	appear
analyze	6282:22	6045:2,24	3,20	6147:10
6048:3	6311:15	6046:3	6109:1,5,1	6212:12
analyzed	answered	6048:24	0,13,16,21	6263:11
6086:13	6047:18	6050:11	,23,24	APPEARANCES
6101:11	6084:24	6051:8	6112:7,21	6015:1
6114:16	6236:8	6057:13	anybody	appears
6204:21	6284:23	6059:13	6096:20	6090:14
6251:20	answers	6061:5,20	anybody's	6166:15
6274:2	6083:6	6064:13,14	6026:19	6287:18,23
analyzing	6101:10	6066:5	anymore	appendant
6090:3	6248:20	6068:4	6149:15	6100:16
and/or	antici	6069:1,12	anyone	Appendices
6121:23	6111:19	6071:9,22	6028:4	6113:19
Anderson	anticipate	6072:14	6142:20	appendix
6015:19	6055:23	6078:15,16	anything	6029:20
Anishnaabe	anticipated	6079:5,18,	6021:19	6038:3
6138:16	6266:24	22	6023:5	6056:1
annual	Antoine	6080:3,8,2	6028:21	6060:24
6115:13	6015:16	1	6097:12	6061:4
6121:24	6016:10	6081:20,25	6111:17	6062:4
6123:1	6018:9,19	6082:7,24	6145:19	6063:10
6127:9	6020:1,2,1	6083:20,21	6146:2	6084:3
6169:14	3,17,18	6084:10	6190:25	6103:13
6187:13	6021:20	6086:1,14	6197:24	6112:14,16
6237:8	6023:7	6087:12,18	6283:11	6115:2
6240:11	6024:23,24	6088:2,12,	6291:9	6121:14,16
6244:23	6025:12	21	6300:22	6125:17
6274:7,18,	6026:6,21	6089:1,13	6308:25	6126:1,23
19	6027:17	6090:2,11,	6309:23	6152:7
anomie	6028:22	13	6319:15	6163:9,20
6144:14	6029:18	6091:1,19,	anyways	6165:3
answer	6030:15,20	21,22	6072:20	6169:7
6041:13	6031:2	6092:11,15	anywhere	6230:19
6044:7	6032:9	6094:10,11	6176:7	6242:21
6045:3	6033:2,10,	6095:18	apart	6245:5
6047:17	24	6096:25	6095:4	6250:19,25
6057:21	6034:7,14,	6097:22	6198:6	6259:7
6059:14	20,23	6098:9,13,	apologize	6261:9,14
6069:13,18	6035:6,11,	20,21	6100:25	6269:20
6093:19	24	6099:1,13,	6102:19	6273:15
6097:2	6036:2,8,2	17	6120:20	6274:1
6101:9	4	6100:6,15,	6148:20	6275:24
	6037:8,16,	22,23	6242:17	6279:23
	24 6038:10	6101:25		
		6102:12,13		
		6103:6,19,		
		24		

apples 6302:11,12 6304:2	6057:16,23 6061:18 6068:6 6074:19	aqua 6257:25 6258:6,8,1 5,20	articulate 6176:10 6204:6	6091:16 6276:5 6277:21 6278:2
applicable 6217:24	6082:25 6091:17	arbitrage 6312:14	articulation 6177:13	assigning 6031:3 6032:21 6033:7 6034:3
application 6042:19 6044:16 6092:17 6248:16	6095:5,11, 16,21 6096:7 6097:8 6104:21 6113:20,25	archival 6136:8	aside 6027:5 6058:1 6152:5	assignment 6090:1 6279:19
applied 6054:1 6265:20	6096:7 6097:8 6104:21 6113:20,25 6131:24 6214:12 6270:7	Arctic 6137:18	aspect 6052:17 6118:2	assignments 6110:15
applies 6047:24	6277:19 6280:11,13 6309:4 6316:14,18	area 6094:12 6101:19 6103:7 6105:8 6113:16 6124:19 6151:8 6212:24 6247:4,11 6251:11 6258:15 6316:2	assaulted 6146:24	assigns 6063:11
apply 6026:5 6075:1 6128:2 6139:8 6221:4	appropriateness 6061:24 6062:23,25	areas 6024:8 6068:10 6102:24 6137:8	assaults 6147:4	assist 6179:6
applying 6041:4 6054:18 6221:12	appropriates 6062:24	aren't 6021:10 6059:16	assert 6166:1	assistance 6061:6
apportioning 6090:17	approval 6027:9 6208:5	argue 6043:21	asserts 6116:16	associated 6043:4 6049:12 6050:1 6121:19
appot 6095:20	approvals 6211:7,22	arise 6134:8	assessed 6136:20	Associates 6016:5,16 6019:21 6101:17 6151:15 6207:2 6266:19 6283:2
appreciate 6091:25 6133:13,25 6134:1 6147:8 6248:20	approved 6026:13,20 6260:10	arising 6135:17	assessment 6105:18 6188:11 6280:13 6282:5	asset 6271:3 6272:11
approach 6050:16 6130:23 6131:1 6134:24 6165:7 6274:16 6284:25 6285:1,3,9 6286:16	approximate 6207:3	Arkansas 6213:24	assets 6266:21 6267:6 6270:15	Associates's 6067:2 6266:20
appropriate 6033:11,16 ,18,20 6045:19 6052:9,10	approximatel y 6170:6 6187:16 6282:7 6303:6	arrangements 6262:7 6319:12	asset's 6272:2	assume 6024:15 6048:1,8 6069:15,19 6078:18,19 6103:20 6159:22,24 6160:1 6209:5 6221:3 6258:19 6310:5
	approximatio n 6032:20 6039:22 6313:1	arrive 6280:2	assign 6048:6 6053:20 6277:17	assigned 6030:22 6040:15 6052:15,19 6079:19,21
	approximatio ns 6112:15	arriving 6064:20 6066:12		assumed
	April 6014:24 6276:21	Arthur 6134:24		

6030:11	6229:24	6098:5	6287:4,11,	authorized
6049:10	6234:24	6100:14,19	17	6167:23
6070:20	6282:3,24	6101:13	6288:1,14,	6168:3
6081:5	6283:22	6102:7,10,	23	availability
6082:9	6306:5,11,	19 6103:23	6289:11,15	6262:20
6101:1	13,22	6104:3,11,	6290:8,12	available
6130:18	6307:12	18,22	6291:3,16,	6023:2
6189:16		6113:14	22 6293:11	6037:23
6281:2	assuring	6114:1,24	6294:7,12,	6120:5
	6182:21	6115:18	16,21	6149:10
assumes	asterisked	6116:1,21	6295:1,22	6160:2
6043:2	6218:25	6117:10	6296:14,21	6163:12
6069:19	Athas	6151:17,22	6297:12,21	6164:12
6206:1	6016:7,18	6206:24	6298:2,5,1	6165:22
assuming	6019:23	6264:17,24	2,17,22	6220:14,18
6035:14	6030:13,19	6265:7,12,	6299:2,18,	6254:20
6038:7	,25 6031:7	18,23	21 6300:1	6261:20
6069:16	6032:12	6266:7	6301:23	6318:21
6101:23	6033:7,19	6267:5,16,	6302:2,6,1	
6120:15	6034:1,6,1	20,24	0,19	Avenue
6121:4	3,19,22	6268:5	6303:7,16	6014:22
6187:2	6035:16,25	6269:24	6304:9,16	avenues
6199:2	6036:6,23	6270:4,11,	6305:12,24	6063:3
6220:14,18	6037:7,13,	16,24	6306:6,17	aver
6221:12	17	6271:8,12,	6308:9,20	6177:24
6296:21,22	6038:1,11	22	6309:10,19	average
assumption	6039:4,9	6272:1,21,	6310:9,23	6097:4,10
6038:23	6040:8,18,	25	6311:23	6111:4
6080:24	19 6041:4	6273:6,20,	6312:15,20	6114:15
6081:12	6044:6,25	24	attached	6166:5
6195:23	6047:14	6274:6,11,	6236:10	6170:9,12,
6206:5	6050:5,10,	15,21,25	attack	18
6216:12	25 6052:12	6275:7,13,	6038:19	6171:5,17,
6217:4,6	6055:17	21,25	attempt	19
6218:2	6060:20	6276:8,12,	6044:18	6172:3,4
6228:5	6062:1	23	6064:14	6173:2,7
6282:6	6064:10,25	6277:2,9,2	attention	6176:4,23
6305:13	6066:13	4	6029:20	6177:24
6306:13	6067:22	6278:7,11,	6134:6	6180:10,21
6307:6	6068:15	18	6143:18	6181:1,3,5
6311:20,25	6073:5	6279:2,14,	6192:16	,10,13,17
assumptions	6075:6	20,24	6282:3,10	6182:7
6042:25	6078:22	6280:6,15,	attorney	6184:13,17
6063:1	6079:20,24	19,24	6311:7	6189:10
6070:25	6080:6,13	6281:9,11,	attractive	6219:19
6078:25	6081:8,23	14,23	6023:1	6220:19
6079:11,17	6082:4	6282:1,14,	6028:14	6221:12,17
6111:13	6083:24	23 6283:10	August	,23,24
6125:21	6084:8,16	6284:16,22	6042:19	6222:23,24
6206:2,22	6086:7,23	,24	6043:18	6223:18,25
6216:5	6089:4	6285:5,10,		6224:14,16
6217:12,17	6095:10,25	14,16,24		6225:6,7,1
6218:19	6097:11	6286:6,10,		7 6226:4
		13,23		

6227:7	backup	6049:15,17	basis	6143:24
6228:4,7	6079:17	6063:2	6056:4,6	bearing
6236:23	6190:13	6065:23	6097:10	6154:15
6237:8	6315:16	6068:22	6114:4	beautiful
6241:16	bad 6100:4	6075:9	6131:20	6141:19
6242:9	6141:7	6100:12	6157:1	6144:24
6243:13	6263:11	6136:8	6170:16	became
6244:3,4,5	6300:13	6144:6	6176:3	6089:10,14
,9,14,24	6301:3,15	6174:24	6184:19	,17
6254:14	balance	6175:4,5	6203:8	become
6255:18	6132:9	6182:13	6208:5	6087:21
6257:2	band 6047:3	6194:16	6209:10	6138:25
averaged	6048:3	6208:10,20	6254:19	6286:19
6255:19	6061:10	6217:11	6256:24	becomes
6257:3	6146:6	6218:24	6262:17	6059:4
6296:4	bank 6270:25	6221:5	6290:15	6096:16
aware	bare 6215:11	6228:4	6292:23	6139:16,17
6087:21	bargaining	6229:14	6313:10	6287:22
6089:8,14,	6238:13	6232:25	basket	Bedford
17 6131:3	Barnesville	6234:18	6160:6,12	6015:7
6210:13	6253:9	6247:21	Bay 6137:17	bedrock
6211:3,17	base 6038:21	6250:19	BC 6165:5,17	6144:12
6212:8,11	6060:9	6251:17	6166:8,22	begin
6213:4	6069:15	6259:8	6167:4,5,7	6124:24
6248:13	6070:9	6266:22	6168:14	6130:15
6255:18	6087:2	6303:9	6169:5,6,8	6151:4
6262:5	6149:10	baseline	,17 6170:3	beginning
6268:15,18	6207:7	6216:25	6171:2,4,1	6055:15
6275:22	6210:18	6258:1,8,2	6 6172:6	6170:1
6276:9	6258:7,13	0	6175:19	6243:18,19
6279:21,24	6285:16	6284:11,19	6176:23	begins
6308:10	6290:20	6286:16	6177:22	6074:18
away 6305:18	6292:25	6287:8,19,	6178:17,20	6243:1
axis 6244:15	6293:5	23	6179:2,17,	behalf
6245:1	6294:10	6288:13,21	23 6180:5	6133:12,19
<hr/>	6295:4	6291:1	6181:16,17	behaved
backed	6302:1,8,1	baselines	6182:1,15,	6136:5
6179:1	7 6305:9	6288:16	16,24	behind
back-end	based	basic	6183:4,17	6315:11
6084:6	6026:11	6156:18	6184:4,9,2	Bel 6014:16
background	6028:8	basically	2	6073:16
6044:8	6031:15	6025:16,24	6185:4,8,1	6075:4
6080:11	6032:5	6027:5	3,20	6152:17,23
6086:18	6034:10	6030:16	6186:24	6204:9
backing	6035:1	6123:12	6192:17	6297:3
6062:2	6037:2	6139:22	6193:23	6299:24
backstopping	6040:6,13	6158:9	BC's 6166:3	belief
6183:4	6042:19	6182:21	6175:18	
	6045:7,10	6183:11	Beardy	
	6047:18	Basin	6146:23	
		6187:13	Beardy's	

6142:13	6218:1	6077:24	23 6021:7	1 6015:2
6233:17	6270:6	6099:23	6023:3	6018:13
believe	6316:24	6113:1	6025:20	6049:17
6018:4,12	below-	6257:4	6026:7	6112:25
6035:21	average	6273:5	6030:1	6132:3,8
6039:13	6244:18	better	6042:9	6172:20
6070:18	beneficial	6033:13	6049:5	6207:11
6082:10	6072:10	6072:13	6063:22	6232:1
6083:24	6093:3	6090:6	6072:17	6249:19
6085:5	6302:23	6092:12	6083:7	6290:10
6089:14	benefit	6093:1	6086:17	Bob 6015:2
6096:6,9	6093:25	6105:14	6089:16	6317:7,21,
6101:13	6100:10	6129:5	6131:14	25 6318:11
6107:12	6143:14	6167:11	6134:1	bond 6276:11
6113:5	6211:23	6234:14	6147:17	Bonjour
6125:1	6263:18	6278:23	6148:3	6018:9
6133:7	6293:18,22	beyond	6155:1	Bonneville
6135:16	6302:1,8	6091:15	6158:18	6165:5,17
6141:10	6304:7,9	6102:9	6179:12	book 6017:20
6143:2,6,7	6311:21	6117:6	6230:3	6136:7
6147:16,24	6312:9,18	6267:23	6261:15	6150:2,8
6149:14	6317:6	bi-	6294:9	6152:3
6164:20	benefited	directiona	6316:3	6160:21
6177:21	6311:22	l 6256:23	bite 6090:14	6164:1
6192:13	benefits	bigger	6091:8	6165:3
6229:16	6031:9	6213:14	bites 6091:2	6166:8
6243:2	6071:17,23	bilateral	black	6169:23
6245:17	6090:17,18	6162:21	6244:14	6177:19
6250:21	,19,22	billion	6296:13	6178:11
6251:22	6130:9	6034:17	6297:20	6180:3
6252:3	6211:8	6035:13,18	6303:10	6186:6,8
6261:14	6251:10	6036:5,16,	6305:2,3,1	6188:1
6263:24	6273:18	19,20	4	6194:8
6264:17	6290:13	6042:21	Blackberry	6198:9,22
6275:7	6291:7,15	6260:11	6252:11	6199:6
6277:19	6293:10	6285:20	6253:3	6215:25
6280:24	6297:8	6302:9	blacked	6229:19
6282:13	6298:10,21	6303:6	6030:4	6230:17,18
6286:4	6301:21	6304:14	blanked	6236:16
6288:1,8	6303:4	6305:8	6030:7	6237:4
6290:12	6309:6	bills	blockade	6240:3
6291:4,24	6311:25	6272:13	6146:6	6242:17,19
6292:6,23	6312:10	biomass	blue 6220:10	6257:10
6293:15,18	besides	6126:20	6244:2,16,	6264:14
,19	6102:8	6127:20	17 6285:2	6266:1,17
6300:24	best	Bipole	6298:4,7	6281:22
6310:9,12,	6041:10,13	6262:2	6303:8,12	6282:4
25 6317:1	6057:16	bit	Board	6283:18,22
believed	6066:17	6020:6,21,	6014:3,14,	6284:13
6064:19	6067:7,8	15,16,17,2	15,16,17,2	6290:2,3
believes	6074:15			6294:4,5
				6296:9,25

6301:19	16	3,18,24	6292:22	6174:1,15
6306:2	6267:3,10,	6299:13,20	6306:25	6175:23
books	17,21,25	,23	Brandon	6176:14,21
6135:12	6268:8,10,	6301:17,18	6202:7,20	6177:9,15
6273:2	15,20	,24	6203:17	6178:8
Borison	6269:4,10,	6302:3,7,1	6309:17	6179:10
6264:22	15,19,25	5	6310:5,7,1	6181:22
boss 6270:19	6270:5,12,	6303:2,14	1 6311:4	6183:1
bottom	18	6304:6,11	break	6184:1
6043:1	6271:6,9,1	6305:7,21	6078:17	6185:23
6069:5	9,23	6306:1,8	6082:25	6188:4,24
6099:2	6272:18,22	6307:14,22	6131:24	6189:4,21
6146:10,13	6273:3,10,	6308:1,2,1	6132:19	6191:8,15,
,14	14,21,25	0	6158:18	20 6192:8
6186:14	6274:7,12,	6309:1,16	6214:12,25	6194:4
6188:15	16,22	6310:4,18	6249:4	6195:4
6223:11	6275:4,9,1	6311:16	6263:18	6197:13
6229:5	7,22	6312:8,17,	breakdown	6214:22
6231:15	6276:2,9,1	23	6160:24	6216:16
6240:11	3,24	6313:5,8,1	6161:11	6219:14
6241:13	6277:6,20	5,22	6197:3,9,1	6222:1
6257:24	6278:1,8,1	6314:5,9,1	9 6198:4	6223:2
6283:23	2,24	3,15,19	breakdowns	6225:1
bou 6311:10	6279:10,18	6315:7,12,	6197:23	6228:19
bound 6243:4	,21	17,23	brief	6231:11,22
boundaries	6280:4,12,	6316:1,9	6035:4,9	6232:10,21
6237:7,11	16,20	6317:3,9,1	6037:11	6234:8
boundary	6281:6,10,	4,17,18	6040:24	6235:1
6058:11	12,19,24	Boyd's	6050:8,18,	6239:3
bounds	6282:2,9,1	6150:19	23 6064:23	6242:14,23
6067:17	3,20,21	bra 6057:3	6071:20	6245:15
box	6283:3,14,	bracket	6080:19	6249:6
6200:10,11	17,20	6055:22	6082:21	6251:2
6201:16	6284:3,6,7	6057:3	6088:8	6252:21
boxes	,17,23	6058:18	6094:8	6255:25
6302:25	6285:6,11,	bracketed	6095:8	6257:12
Boy 6074:13	15,18,25	6047:12	6098:7,18,	6260:7
Boyd 6015:6	6286:9,11,	6058:7	24 6099:8	6261:11
6016:22	14	brackets	6103:4,17	6263:15
6150:17	6287:1,5,1	6058:5	6105:6	6267:8
6151:10,25	2,18	brain	6117:16	6273:12
6215:4	6288:10,19	6292:18	6122:4,11	6275:15
6249:2	6289:5,14,	branch	6123:4,17	6278:16
6264:1,3,7	23	6063:10	6128:11,15	6279:16
,8,9,21,25	6290:9,24	6289:18	6130:3	6281:17
6265:9,16,	6291:13	6291:11	6134:20	6284:1
21,25	6293:9	branches	6146:11	6289:9
6266:8,11,	6294:3,8,1	6063:12	6162:6	6291:20
	3,17,23	6085:10,16	6164:3	6299:11
	6295:17	6086:12	6166:12	6304:4
	6296:7,16,		6171:22	6305:5
	24		6173:17	6306:15
	6297:17,22			6307:25
	6298:3,9,1			6310:16

6313:20	6142:15	6169:5	6154:14	6043:7,17,
6315:4	6143:12	6289:2	6156:20	18 6044:12
briefcase	6145:4	6293:14	6169:12	6047:25
6215:17	6208:3	calculates	6170:10,12	6048:6,13
bring 6035:1	6259:21	6292:16	6185:13	6049:21
6051:9	bullet	calculating	6188:21	6051:2,14,
6068:11	6043:1	6268:6	6189:10,19	20
6071:13	6090:15	6272:7	6195:16	6052:6,19
6078:7	6091:9	calculation	6227:23	6053:5,9,1
6094:16	6105:16	6167:24	6228:10	2,17,21
6134:5	6106:19	6168:4	6229:2	6054:3,20
6151:10	6116:9,11	6175:14	6260:15	6056:2,3,1
6282:2,10	bullets	6182:9	capaci	1,23,25
brings	6108:1	6227:21	6120:15	6058:14
6027:11	6231:15	6246:15	capacity	6059:18
British	bump 6145:25	6269:9	6076:6	6060:3,22
6175:14	bunch	6293:16	6118:22,23	6061:2
6182:5	6057:24	6311:2	6119:13,20	6064:17
broad	6082:1	calculations	6120:12	6066:23
6046:20	business	6035:23	6121:2,5	6096:11
6134:5,18	6143:11	6045:6	6123:22	6114:18
broader	6272:15	6103:20	6124:2,10	6148:12
6044:16	busy 6133:24	California	6127:6,10	6169:9,10
6195:1	buying	6187:21	6139:12	6230:5,15,
brought	6270:19,21	camp 6146:18	6153:6	16 6232:14
6036:12	Byron	Canada	6154:21	6233:2,10
6052:7	6015:11	6276:10	6157:2	6235:6
6313:17	6149:4	candid	6158:8	6238:1,6,7
build 6022:3	6318:5,15	6316:3	6160:20	6274:8,17
6026:10	6319:9	canvass	6161:16,25	6307:21
6077:22		6097:24	6187:9	6311:24
6078:4,5		6113:6	6196:25	capitalizati
6144:24,25		6250:23	6197:2	on 6274:13
6209:16		6259:5	6213:8	capitalize
building		6261:6	6217:3,19	6260:22
6077:11	CAC 6015:11	canvassed	6218:12,13	Capra
6078:2	CAC (Manitoba)	6097:24	6240:10,23	6016:5,16
6135:14	6318:16	6253:17	6241:10,16	6017:3,4,5
6209:18	CAC/Manitoba	cap 6038:22	,23 6257:5	,6,7,8,9,1
6239:12	6276:14	6229:23	6258:1,9,1	,14
6317:18	calculate	capa 6120:15	6,21,22	6018:12,23
builds	6039:21	capability	6260:22	,25
6141:11,19	6270:16	6022:10	6261:20	6019:1,3,5
6197:21	6289:2	6023:3	6295:5	,7,9,11,13
built	6292:22	6118:2	capital	,15,17,19,
6022:17,20	6293:3	6120:16	6020:15,24	21 6020:22
6024:7	calculated	6123:12	6021:14	6021:12
6094:1	6168:23	6129:13,18	6026:14,16	6027:18
6138:23			6037:5	6030:12,17
			6038:22,23	,24
			6039:12	6031:1,3,5
			6042:21	

,11	6236:6,8,1	6053:18	24,25	6286:7
6033:11	0 6241:24	6055:9	6305:14,25	CCGT 6069:8
6038:2,8	6242:3,21	6056:20	6306:1,3,1	central
6042:21	6243:9	6069:8	2,20	6253:18
6046:6	6247:11	6070:9,14	6308:5,14,	centre
6049:2,6,9	6250:9	6075:14,18	19 6311:22	6237:15
6050:14	6266:19,20	6077:9	6312:11,19	certain
6052:1	6267:4	6085:2	,22	6055:19
6057:16	6282:11	6089:12	6313:10	6059:7
6064:18	6283:2	6093:7,17,	6314:12	6075:10
6068:11	6284:8	23	6315:11,16	6096:16
6084:3	Capra's	6094:2,5	cases 6069:3	6131:4
6086:18	6021:2,4	6106:5	6070:21	6141:18
6087:13	6028:23	6120:8	6073:11	6156:21,22
6088:5,13	6045:25	6123:8	6077:10,17	6204:21
6089:14	6049:15	6128:9	,19	6271:18
6091:7	6066:24	6137:15	6078:24	certainly
6092:1,20	6068:8	6138:20	6081:9,12,	6056:15
6095:3	6087:19	6139:9,14	16 6093:24	6081:13
6097:7	6094:13	6158:6,11	6105:20	6082:5
6098:1,10	6095:20	6206:2,4,1	6110:25	6104:22
6100:12,16	6098:2	1 6209:3	6135:17	6139:14
6102:4	6099:15,19	6217:12	6140:25	6270:21
6103:24	6101:3	6226:11	6144:6	certainty
6104:8	6104:15	6231:16	6193:19	6277:13
6105:11	6106:1	6232:5,19	6299:7	Certificate
6110:10	6121:15	6234:14	cash 6140:18	6016:24
6112:8	6186:14	6245:3,20	6266:23	6210:24
6113:1	6227:21	6258:7,13	6267:22	Certified
6115:2	6242:20	6268:19	6269:7	6320:2
6121:16	6250:19	6276:6,20	6271:2,4,1	Chair 6113:9
6125:17	caption	6285:2,12,	6,17,20,24	6148:3
6126:1,16,	6040:11	17 6287:8	6272:8,22	6214:24
18,19,24	capture	6289:1	6274:10	6249:19
6127:4	6270:14	6290:20	cashflow	6264:3
6151:15	care 6307:3	6292:25	6274:3	6284:3
6161:24	carried	6293:5	6275:5	6316:1
6168:23	6116:7	6294:8	cast 6046:19	6319:1
6177:18,21	6215:8	6295:4	catastrophic	Chairman
,22	carry	6296:2	6203:10,16	6103:7
6186:6,8,1	6160:23	6297:4,19,	categorize	6116:23
8 6190:18	6161:16	23,24	6300:20	6249:13
6191:13	6168:8	6298:10,20	categorized	Chairperson
6195:8	6316:6	,23,25	6115:20	6014:13
6207:2	carrying	6301:2,7,1	6260:12	6018:3
6208:2	6169:11	4	category	6020:10,14
6216:4,6	case 6031:7	6302:13,22	6050:12	6023:8,18
6217:18,25	6034:12	,24	6102:22	6024:1
6219:1	6035:20,21	6303:5,11,	caught	6038:19
6221:14	6038:21	15		
6227:19,22		6304:6,15,		
6229:23				
6230:4,20				
6235:4				

6039:5	6034:21	6311:24	6288:15	6041:21
6040:20	6038:21	changing	chastised	6045:8
6041:1	6039:10,11	6056:20,21	6120:23	6059:17
6053:3	,16 6042:2	6057:4	check	6060:18
6064:8	6043:20	6152:24	6035:22	6278:13
6076:4	6052:10	6245:20	6109:18	6288:12,13
6078:13	6053:2	6284:19	6149:10	,15
6083:9,15	6055:5	6286:15	6163:20,21	choosing
6091:14	6056:10	6309:22	6164:1	6021:16
6093:6	6057:1,5	6310:2	6167:16	6025:8
6100:17	6069:25	Chapter	6168:25	6034:9
6102:8	6070:2	6275:23	6180:18	6044:2
6109:7,12,	6071:5	6292:12	6185:13	6045:4,9
15 6113:4	6073:10,13	6293:21	6187:17	6048:15
6116:24	6091:10	characterist	6202:20	6104:15
6117:14,18	6100:1	ic 6073:9	6222:3	6290:14
6131:23	6139:19	characterist	6233:4,6,1	6293:19
6132:18	6223:8	ics 6071:7	2,19	chose 6045:8
6133:6	6247:6,13,	6110:3	Cheers	6052:23
6145:9	17,21	6242:11	6147:15	6056:10
6147:7,16,	6248:4,16	6274:3,23	cheque	6095:15
23 6156:5	6308:22	6275:6,8	6272:14	6104:8
6160:5	6309:23,24	characteriza	Cheryl	chosen
6214:11,19	6310:3,25	tion	6320:7	6043:6
6215:14	6311:3	6181:11	chicken	6046:7
6226:21	6315:22,23	charge	6105:15	6061:25
6234:10,19	changed	6024:11	6107:10,14	6068:6
6249:8,14	6039:13	6062:8	chief	6084:20
6263:10,17	6048:2,5	6065:13	6135:23,25	6292:25
,24	6053:10	6066:16	chief's	Christian
6283:14,19	6100:3	charged	6135:24	6015:24
6284:4	6114:17	6065:13	6136:4,10	6038:5
6316:7,11	6137:20	6091:11	cho 6056:10	6041:12
6317:5,23	6216:5,12	6138:8	choice	6082:14,23
6318:8,12	6218:14	chart	6026:24	6098:11,15
6319:14	6226:3,7	6067:16	6065:6	6106:13
Chairperson'	6253:14	6079:2,4	6114:11	6107:12
s 6040:13	6278:8	6085:25	6127:5	6132:1,14
6092:2	6287:7	6104:8	6158:5	6189:23
challenge	6293:6	6181:15	6273:5	6190:10,20
6319:6	6309:12,13	6219:19	6300:9	6191:2,17,
chan 6024:18	changes	6224:11	choices	23
6056:20	6052:19	6229:5	6095:19	6192:6,12
chance	6054:25	6237:10	6154:18	6257:14
6103:14	6071:4	6257:18,22	choose	6268:10
change	6107:25	,23	6021:12	6282:9,16
6023:16	6113:22	6258:6,23	6025:6	6307:14
6024:19	6127:1,10	6288:2,3	6032:15	6316:23
6028:7	6216:25	charts		circled
6029:3,12	6288:9			6188:21
6031:12	6294:22			6189:2,9
	6308:25			

circles 6269:16	6160:4 6222:15	6134:25	6069:23,25 6070:1	6153:24 6250:23
circulated 6148:3	6236:1 6249:2	coincident 6162:14	combines 6094:5	commercially 6029:25 6110:17
circumstance 6228:23	6258:14 6268:11	cold 6199:8,19 6200:6,15, 16	combustion 6069:24 6070:1	Commission 6141:21 6145:21 6266:2
circumstance s 6129:4 6153:8 6228:14	6291:4 6297:5 6303:17 6308:18 6310:18 6311:8	6201:1,9,1 3,21 6239:22	comes 6041:14 6065:8 6160:10 6195:7 6303:23	commissioner 6136:2
claim 6140:20	clearly 6022:17 6023:3 6058:19 6069:18 6070:2 6073:3 6121:8	colleague 6105:14 6309:22	comfortable 6039:22 6295:13	commit 6059:7,12
claiming 6247:11	client 6065:9 6190:5	colleagues 6133:21	coming 6052:3 6226:22 6250:21	commitment 6099:18
claims 6134:9,10 6135:18 6136:16 6137:6	climate 6247:6,12, 13,17,21 6248:4,15	Colorado 6237:18	commence 6083:17 6125:5 6133:7	commitments 6182:22
clarificatio n 6072:18 6115:4	climatology 6247:14	colour 6257:25 6258:15	commencing 6018:1 6166:3	committed 6059:6,8 6080:2 6314:12 6316:12
clarify 6037:14 6038:12 6068:19 6071:10 6084:2 6096:5 6100:19 6152:18 6166:14 6196:15 6222:25 6274:22	climol 6247:13	Columbia 6175:14 6182:5 6187:13	comment 6021:12 6044:6,7 6045:1 6050:14 6186:23 6247:17 6269:5 6299:14	Committee 6188:8,9 6189:24
clarity 6062:2 6073:6	close 6042:20 6055:9 6071:13 6144:17 6201:24 6295:24 6296:3,5 6312:6	column 6079:25 6167:7 6184:4 6188:21 6189:1,9 6216:11,24 6217:2,5	commentary 6261:7	common 6020:25 6037:5 6081:14 6269:21 6273:16
clause 6137:12,20	closer 6049:20 6057:7 6127:11 6158:18 6273:23 6305:11	columns 6081:18	commented 6042:22	communicate 6082:12
Clean 6141:20 6145:21	coal 6203:16	combination 6070:24 6075:11 6128:20,25	comments 6024:25 6040:13 6049:6 6061:12,24 6092:2 6094:13 6108:22 6147:10	communities 6138:6 6140:4,10 6141:4,5,6 6142:10,17 ,19,21 6143:1,10, 22 6144:4,8 6145:1,2
clear 6054:18 6113:2 6133:20 6154:12	co-chair	combined		community 6144:13 6145:3 6146:20
				Company

6027:5	6193:2	13	6049:7,9	6290:6
6049:22	6202:13	6027:6,19,	6050:15	6292:14
6266:3	6292:9	24	6052:2	6293:1,24,
company's	comparisons	6028:14,25	6112:9	25 6306:21
6273:2	6084:11	6029:7,14	6165:1	6309:18,25
compar	compelled	6043:3	6262:19	conduct
6305:13	6068:2	6046:11	6263:3	6082:19
comparable	compensatory	6049:11	conclude	6110:10
6120:7	6101:15,23	6052:3,6	6208:5	conducted
6190:6	6102:3	6054:2,11	6276:25	6124:5
comparative	compete	6056:11	concluded	6251:2
6114:8	6204:18	6058:23	6161:25	confer
comparativel	competitor	6059:11	6204:10	6044:9
y 6020:6	6204:25	6099:14	6313:9	6049:25
compare	complement	6131:12	conclusion	conferred
6021:21	6096:2	6216:6	6030:18	6058:8
6034:11	complete	6312:13	6049:4	confess
6165:4	6082:11	Conawapa26	6095:4	6079:7
6166:8	6144:14	6026:25	6101:12	configuratio
6183:20	6151:5	Conawapa's	6102:5,17	n 6111:8
6294:2	6317:22	6028:1	6107:6	6123:14
6298:24	completed	6059:16	6134:16	6127:2
6302:11	6103:8	concentratin	6219:22	6128:1,8
compared	6254:12	g 6250:18	6254:6	configuratio
6068:17	6275:23	concentratio	6315:8	ns 6105:24
6110:11	completely	ns 6251:13	conclusions	6106:23
6166:22	6292:6	concept	6075:24	configure
6168:17	component	6074:12	6105:10	6074:23,24
6181:10	6022:1	6131:1	6114:20	configured
6185:9	6206:13	6204:11	6292:4	6263:5
6196:8,17	components	6205:6	condition	confirm
6291:5	6076:2	6259:9	6022:12	6040:2
compares	6097:5	conceptual	6176:9	6102:14
6167:12	6205:23	6292:23	6209:3	6153:24
6240:23	6301:8,9	conceptualiz	6245:21	6156:9
6241:5	composes	e 6293:7	conditions	6163:5
6290:25	6128:18,24	concern	6022:14	6171:11
comparing	comprehensiv	6049:13	6026:1,4	6179:17
6071:15	e 6136:16	6055:12,13	6141:3,17	6193:12
6183:17	con 6054:13	6087:10	6153:5	6197:1
6184:22	6111:8	6118:21	6155:18	6213:10,17
6201:12	6198:3	6140:12	6156:21,22	6214:4
6233:19	6272:10	6147:1	6162:15	6216:24
6270:15,20	Conawapa	concerned	6163:13	6217:17,25
6292:14	6022:22	6134:5	6164:13	6229:13
comparison	6025:3,14	6142:8,9	6166:6	6237:10,16
6021:19	6026:8,10,	6146:20	6169:16	6245:2
6072:16,21		6215:3	6170:17	6247:9
6190:8		concerns	6176:4	6248:12
			6220:19	
			6221:13	

confirmation 6102:18 6132:4 6202:17 6306:11	6316:18 considerable 6119:14 6287:21,24	constraint 6132:24 6152:25 6309:12 6316:22	6042:13 6046:5 6058:23 6090:24 6110:20	6156:8 6158:16 6160:8 6192:21 6215:23 6226:24 6235:3 6257:17 6282:20 6284:6 6301:17 6308:1
confirming 6227:22	consideration 6077:14 6127:8 6147:12 6193:18 6219:17 6283:13	constraints 6316:20	contiguous 6143:21	
confirms 6101:4 6105:17 6231:5 6232:4 6306:3	considered 6028:19 6045:18 6052:2 6064:20 6065:22 6066:12 6068:1 6106:9 6138:12 6142:13 6162:16,22 6204:3 6205:4 6269:16 6271:13 6280:11	constructed 6070:17 6259:14	contingency 6203:24 6261:7,8 6262:7,15,16,20	
conjunction 6103:2 6251:12		construction 6027:21 6028:5 6056:8 6061:9 6066:10 6205:8,16 6274:8,14	contingent 6134:7,23 6135:10 6138:24	continues 6030:8 6050:15
connect 6256:5		consultant 6091:17	continually 6131:8	continuing 6097:14 6142:1
connected 6187:21		consultants 6062:10 6082:13	continue 6028:24,25 6045:3 6049:13 6069:13 6098:10 6099:19 6106:1 6130:7 6141:17 6143:16 6178:21 6195:8	continuous 6053:18
Connecticut 6300:5,15		consultation 6018:12		contract 6027:15 6052:1 6054:9,11,14 6055:2,3 6129:13 6158:9 6161:4 6162:21 6217:16,18 6218:4
connecting 6256:13,16		consumers 6085:17,22		contracts 6026:11 6027:20 6161:19 6163:2 6309:14,15
connection 6193:8 6256:8	considering 6075:3	contain 6126:3	Continued 6016:5,9,16 6019:21 6020:1,17 6024:23 6039:25 6041:8,17 6064:13 6078:15 6083:20 6091:21 6094:10 6098:20 6100:22 6102:12 6106:18 6107:18 6109:23 6151:15 6155:8	
Conowapa 6254:9	considers 6189:17 6267:18	contained 6229:21 6247:22		
consecutive 6243:17	consist 6128:19,25	contains 6167:20		
consequences 6146:19	consistent 6131:3 6162:1 6163:13 6164:14 6292:6 6315:21	contemplate 6077:24 6229:3		contrast 6025:1 6259:20
Conservation 6188:8		contemplated 6025:21		contrasted 6036:21
conservative 6283:8		contend 6139:24		contrasting 6284:25
consider 6076:18 6095:12 6108:19 6130:7 6145:17 6158:2 6195:15 6210:2 6271:10 6300:17	constituting 6114:5 Constitution 6139:5 constitution 6139:19 6140:1	contents 6016:1 6266:12 6268:16,18		contribute 6128:6 Convenience 6210:24

convention	23	6219:1,9,1	6279:14	6314:18
6104:23	6039:4,23	2,23,24	6282:8	corresponde
6288:17	6040:9,18,	6220:4,11,	6283:11	ce 6232:4
conversation	19 6042:2	15,21,22	6284:15,16	correspondin
6247:10	6060:21	6221:1,14,	,22	g 6274:13
6280:25	6068:20	20 6222:9	6285:4,5,1	6289:18
converse	6071:17,18	6223:15,20	0,17,24	6300:4
6028:15	6084:7	6224:21	6286:12,22	correspondin
6297:13	6086:22	6225:7,18,	6287:11	gly 6048:4
conversely	6090:22	24 6226:8	6288:22	cost 6028:9
6194:12	6092:10,13	6227:8,25	6290:8	6029:12
convinced	6100:11,14	6229:15,17	6291:14	6039:12
6143:13	6103:22,23	6230:7	6293:10	6043:3
6277:3	6104:18	6231:6	6294:11,12	6044:15,20
cool 6199:14	6118:7,13	6232:5	,16,20	6045:16,18
coordinated	6119:3,8	6234:1,24	6295:21	6046:11,17
6300:25	6124:6	6235:8,11,	6297:20,21	,22
coordination	6125:14	14,25	6298:2,11,	6047:8,9,1
6135:6	6126:13,20	6239:21	12,16,17	2,25
6262:12	6127:13	6242:1,2	6299:1	6048:6
copies	6129:1	6243:14,21	6302:2,6	6049:10,21
6132:7,9	6132:13	,22,25	6303:6	6051:2,14,
copy 6193:13	6154:21	6244:4,19,	6304:8,15	20 6052:6
Corey	6155:14,15	20,24	6305:11	6054:8
6015:22	6161:13,14	6245:9,23	6308:8	6055:3
Cormie's	,21	6246:13	6313:4	6056:2,11,
6157:13	6165:16,23	6247:1,2,1	6315:19	24,25
corner	6167:10	4,15,18,19	6320:2	6058:14,25
6034:15	6175:1	6248:1,17	corrected	6059:5
6186:14	6176:24	6251:5,21	6136:9	6060:3,13
corner-to-	6179:24	6252:12,25	6175:5	6064:18
corner	6184:10,13	6253:4,10	6201:7	6071:4,6
6286:24	6185:1,7,2	6254:22	6216:19	6073:2
Corporate	1 6187:23	6256:19	6286:3,5	6078:19,25
6264:16	6193:14	6258:5	correction	6079:1,4,1
Corporation	6197:11	6259:2,10,	6231:20	1,12,19
6162:11	6198:5	11 6260:1	6232:3	6080:14,23
Corporation'	6203:13,14	6262:3,4	6289:12	6081:12,17
s 6158:23	,20	6266:6,7	correctly	6084:20
correct	6205:12,21	6267:15,17	6094:24	6085:16
6030:19	,24 6206:9	,20	6121:18,20	6096:11
6033:6	6207:15,16	6268:25	6132:12	6101:6
6034:5,6,1	,18	6269:13,14	6161:6	6104:24
2,13,18,19	6208:14	6270:3,4,1	6163:6	6114:18
,22	6209:25	0,11,17	6170:22	6116:14
6036:7,22,	6210:10	6272:20	6206:6	6120:5
	6211:1,2	6273:5,20,	6209:21	6142:3,5
	6213:12	23	6243:10	6148:12
	6214:1	6274:6,21,	6275:20	6178:23
	6216:9,14	24	correlate	6230:5
	6217:7,13,	6275:6,13,	6183:14	6232:8,14,
	14	21 6276:12	correlating	17
	6218:3,15,	6277:23		
	16,22	6278:7,11		

6233:2,10	6236:23	6131:1	creates	2
6234:12	6238:6,7	6251:3	6142:3	criterion
6235:6	6239:19	6253:15	creating	6154:21,22
6236:22	6260:23	6295:9	6142:1	6161:25
6238:1,5	6266:24	6309:2	6143:13	6162:9
6239:12	6267:19	court	6144:18	6171:3
6274:19	6270:8	6138:9,12	credible	6172:7
6288:6	6274:5,7	6169:10	6064:19	6186:20
6291:6,8,1	6291:15	courts	Cree	6194:16,20
8 6292:14	6293:10,18	6137:24	6138:6,16	6195:12,14
6293:3,5,8	,23	6139:10	criter	6196:3,6,2
,19,24	6299:22,23	6140:17	6195:11	5
6299:18	6304:13	6141:1	criteria	6197:2,7,8
6302:10,21	6305:19,22	cover	6071:23,25	,18
6304:10,21	6307:21	6046:21	6073:10,13	6204:4,6
6305:20	cost-shared	6119:24	6139:14	6225:12
6313:12	6259:14	6182:21	6152:9,11	critical
cost-	couch	6183:16	6154:4,7,1	6072:19
effective	6082:15	coverage	5,18,20	6169:15
6118:23	Council	6261:18	6155:5,6,1	6180:23,24
6141:22	6135:1	covered	1,14	6181:7,9
costs	6188:8	6050:13	6157:10,23	6182:4,14,
6020:15,24	counsel	6112:24	,24	20
6021:14	6015:2	6181:25	6159:12	6184:6,20
6026:14,16	6082:12,13	6223:20	6160:20	6228:5,13
6027:21	6151:7,25	6224:1,21	6161:16	cross 6151:4
6037:5	6210:23	covers	6171:16	6152:1
6038:22,23	6213:7	6046:16	6174:19,22	6215:10
6042:21	6296:8	6132:4	,25	6317:2,3,4
6043:7,17,	6317:6	6183:13	6175:4,5,6	crosses
18	count	CPV	,7	6296:19
6044:11,12	6156:19	6267:13,18	6176:10,12	cross-
6045:8	6164:19	,21	,17,24	examination
6048:13	counter	6268:1,7,9	6177:13	6016:9,11,
6049:18	6167:11	6269:5	6183:10,12	12,20,21,2
6052:19	country	CPVs 6096:22	6185:4	2 6020:1
6053:6,9,1	6089:24	6271:15	6194:11,23	6113:12
2,17,21	couple	create	6204:12	6117:24
6054:20	6022:7	6082:1	6205:10,18	6151:20
6056:3	6042:24	6120:2	6217:11	6250:6
6059:18	6044:8	6142:2	6218:21	6262:22
6060:22	6045:1	6243:20	6221:5	6264:7
6061:2,9	6055:18	created	6226:3,7,1	6309:21
6066:10,23	6062:2	6034:8	3 6227:3,5	6317:16
6079:21	6068:9	6142:22,23	6265:20	CSI 6030:7
6081:5	6084:9	,24	6290:22	6080:10
6082:3,6,9	6110:25	6215:10	6308:6,15	6082:18
6126:9	course	6307:10	6309:12,22	6109:9,12,
6134:8,13	6056:22	6313:1	6310:2,19,	17 6122:8
6141:9	6125:11		20,25	
6230:15,16			6311:4,9,1	
6234:5				
6235:11,14				

6132:6	customers	6027:2,25	6130:13	6185:2,10,
6215:7,11,	6103:25	6029:5	6131:6	15,25
12 6316:25	6104:2,5	6041:22	6151:16	6186:3,9,1
6317:4,14,	6115:7	6043:9,13,	6152:15	1,15,17
16,19	6178:24	16,23	6153:20	6187:10,18
6319:3	customer's	6044:5	6154:5,17,	,24
CT 6203:11	6105:4	6045:12	23	6188:13,19
CTs 6202:6	cut 6134:3	6046:2,9	6155:4,15,	6189:6,12
culturally	6144:9	6049:19	24	6192:15,23
6138:15	cycle	6050:20	6156:2,11	6193:4,8,1
culture	6069:23	6053:23	6157:15,22	5
6138:10	6070:1	6058:4	6158:14,24	6194:1,21
cultures	6131:19	6059:22	6159:4,10,	6195:22
6138:16	cycles	6061:19	15 6160:15	6196:4,9,1
cumula	6069:25	6066:14	6161:7,14,	3,19,22
6031:23		6068:24	22 6162:3	6197:5,15,
cumulative		6069:3,17	6163:7,16,	21
6031:21,23		6071:18	23	6198:6,16,
,24	D	6072:1,25	6164:5,10,	20
6032:22	daily	6073:21	16	6199:3,16,
6240:10	6256:24	6076:13	6165:14,24	21
6267:12	Dakota	6079:14	6166:24	6200:8,12,
6270:1	6210:9,13,	6087:16,23	6167:9,14,	17,22
curious	25	6088:10,18	17	6201:3,11,
6089:23	6211:4,13,	,25	6168:1,5,1	17,23
6307:18	15,20	6089:7,21	0,20	6202:3,10,
curr 6227:2	6237:17,18	6090:9,12,	6169:2,20	15,18,22
current	6239:25	23 6091:12	6170:23	6203:6,14,
6059:17	6240:19	6092:7,14,	6171:7,12,	21
6098:3	6253:8	23 6093:14	24	6204:5,15,
6221:5	dam 6135:14	6099:10,16	6172:8,12,	20
6227:4	6141:11	,20	15,21	6205:1,13,
6239:12	6146:2	6102:21	6173:3,10,	21,24
curve	damages	6106:3	14,22	6206:7,10,
6030:10	6136:20	6107:8,21	6174:3,10,	20
6041:23	6138:22	6108:5,10,	17,24	6207:16,22
6048:8,10,	dams 6138:22	16,24	6175:2,8,1	6208:9,15,
11 6083:25	6141:5	6109:3	2,19	25
6288:8	6142:14	6110:13	6176:6,16	6209:9,22
6296:5	6143:3,12,	6112:12	6177:1,4,7	6210:1,11,
curves	19 6145:15	6118:8,14,	,11	15,20
6277:15	danger	25	6178:1,6,1	6211:2,11,
custom	6076:8,10	6119:4,9,1	3,15	18
6138:9	DANIEL	4,22	6179:7,15,	6212:1,4,1
customer	6016:6,17	6120:8,17,	20,25	1,14,20
6105:1	6019:22	22 6121:7	6180:13,19	6213:4,13,
6259:23	6021:18,25	6122:1,6,1	6181:4,12,	19
	6023:12,25	4 6123:6	19	6214:2,7
	6024:3	6124:12	6182:3,10,	6216:10,20
	6025:10,13	6125:7,15	18	6217:1,8,1
	6026:18	6126:14,21	6183:6,9,2	4,21
		6127:14,23	2	6218:7,16,
		6128:21	6184:11,16	23
		6129:2,7	,24	6219:5,8,1

6,24	8,22	database	debate	6291:12
6220:5,9,1	6250:10,15	6239:14	6105:2	6311:9
2,16,22	6251:6,15,	date 6025:5	debated	decision-
6221:2,10,	22	6123:11	6105:2	making
15,21	6252:1,3,1	6127:20	debt 6092:9	6033:23
6222:3,14,	6,23	6157:11	decade	decisions
17	6253:5,11,	6221:6,13	6125:14	6027:16
6223:4,13,	19	6228:16,22	December	6096:12
16,22	6254:2,23	6312:12	6043:20	6100:2
6224:1,6,2	6255:1,5,1	6313:2	6069:10	6130:21
2	2,16,21	dated 6188:9	6188:9	6159:9,12
6225:10,18	6256:1,7,1	6189:24	6189:24	deck 6191:25
,25	7,20,25	6266:4	6191:25	declining
6226:9,12,	6257:7	6306:23	6192:1	6126:8
20	6258:4,11,	David	6306:19	decrease
6227:11,13	18,25	6260:3,9	decent	6199:10,13
,15	6259:3,11,	day 6047:11	6029:10	deemed
6228:1,8,1	18	6132:22	decide	6024:9
7	6260:1,17	6219:4	6067:18	6301:2
6229:1,6,1	6261:1	6247:10	6086:18	Defenders
1,16	6262:4,8,2	6255:20	6107:3	6135:4
6230:1,8,1	1 6263:4	6271:10	6108:7	defer
2,21,24	6264:5	6316:16	6301:9	6027:16,23
6231:1,13,	6266:10,13	days 6022:7	decided	6300:18
19	6267:2	6107:24	6030:23	6312:12
6232:7,15	6268:17	6125:10	6037:2	deferral
6233:3,11,	6269:1,7,1	DCF 6266:23	6075:9	6029:10
13	4,17	de 6063:6	6101:22	6216:5
6234:2,17,	6308:16	deal 6083:2	6249:24	deferred
23	6313:4,7,1	6086:15	decides	6025:2
6235:9,12,	4	6144:24	6029:14	6075:18
15,18,21	6314:3,7,1	6148:7	decision	6217:19
6236:1,13	1,14,16	6190:18	6026:10,12	deferring
6237:1,13,	6315:6,10,	6250:24	6027:19,23	6026:8
20	14,20,25	dealing	6028:20	deficit
6238:3,10,	dark 6257:25	6131:11	6030:14	6180:23,25
15,19,22	dash	6152:5,8	6057:18	6181:7
6239:1,13,	6225:11,16	deals	6064:21	6182:5,15
21,24	dashed	6142:20,22	6066:12	6183:7
6240:7,14,	6220:17	,23	6095:14	6184:6
20	6224:13	6145:23	6099:22,24	define
6241:2,7,1	data 6032:6	6151:7	6100:12	6047:3
2,20	6038:20	6216:24	6106:12,14	6176:18
6242:2,5,8	6039:7	dealt	6108:8	defines
,12	6110:18	6061:16	6129:12,13	6169:8,13
6243:15,22	6111:15,21	6092:4	6158:10	6176:17
6244:1,7,1	6112:4	6097:23	6265:15,19	definitely
2,20,25	6190:13	6141:2	6267:14	
6245:7,17	6238:19,21		6273:16	
6246:2,10,	6239:17		6277:12	
14,23	6245:1,18,			
6247:2,15,	19,23,25			
19				
6248:2,9,1				

6079:20	20	6197:22	6293:22	6221:6
6226:9	6198:1,5	6202:8	described	6257:4
6277:10	6222:8	6203:18	6034:3	6272:19
definition	demand-side	6217:5,23	6058:19	6273:1,4,7
6033:20	6107:4	6218:1,5	6116:18	determined
6071:13	demeaning	6219:4	6157:18	6130:22
6084:18	6146:17	6220:14,20	6234:12	determines
6087:4	demonstr	6221:6	6240:4	6272:23
6169:21	6237:23	6222:7,24	6245:3	determining
6180:24	demonstrate	6223:10,14	6285:9,21	6158:8
6267:24	6125:20	,18,24	6286:17	6165:8
6300:24	6290:5	6224:8,14,	describes	6292:24
6312:7	demonstrates	16 6225:20	6229:23,24	6310:10
degree	6296:11	6226:17	describing	develop
6033:20	6297:8,13	6227:2,5,8	6296:15	6031:14
6087:10	demonstratin	6245:12,23	description	6041:22
6095:13	g 6304:20	6246:1,7,8	6017:2	6065:25
6178:25	demonstratio	,19,21	6040:5,6	6066:16
6185:20	n 6277:7	6295:8	6313:6	6075:18
degrees	Department	6308:5	descriptive	6126:6
6153:21	6236:9	6309:13	6034:4	developed
delay	6281:20	dependent	design	6041:24
6106:24	6282:25	6163:14	6159:25	6105:22
delayed	6283:13,21	6165:10,19	designed	6127:2
6125:23	depend	depending	6308:17	6135:5
6300:9	6212:25	6023:16	detail	6204:17
6313:2	dependable	6024:20	6111:7,16	developers
delaying	6162:17,23	6114:19	6112:13	6248:13
6299:25	6163:11	6265:19	6222:7	developing
6315:18	6164:12,19	6312:3	detailed	6029:16
delays	,23	depends	6061:7	6041:5
6297:15	6165:4,8,1	6311:23,24	6078:22	6063:4
delivered	8,21	depicted	6111:1,15	6081:10
6307:12	6167:24	6237:25	6278:19	development
delivery	6168:4	depiction	details	6014:10
6319:12	6169:18	6188:16	6111:25	6021:12
demand	6171:6,19	depreciation	6252:4	6025:1,2
6087:3	6172:3	6094:25	deter	6026:23
6160:25	6173:2,7	6097:5,10	6272:19	6039:13
6161:2,11,	6176:17	derivation	determinatio	6085:3,22,
18 6162:13	6180:15,16	6056:7	n 6106:16	24
6167:3,5	,22	6223:14	6266:20	6105:20,24
6174:6,9,1	6181:2,3,5	derive	determine	6106:21
3,18	6182:1,8,2	6032:3	6087:8	6126:3,8,1
6175:16,18	3	6033:8	6088:5,13	0,12
6179:19	6183:12,14	6279:23	6152:13	6127:8,12
6180:5	6184:12,16	derived	6156:16	6129:19
6184:7,8	6185:5	6174:19	6165:21	6130:12
6197:3,10,	6195:13	6207:9		6138:6
				6204:18,25

6210:14	6315:8	6290:5	discount	6054:6,23
6216:13	differences	difficult	6061:22	6056:5
6240:6	6035:20	6116:17,20	6062:21,23	6061:8
6243:11	6085:24	dig 6148:24	6063:1,8,1	6063:7,14
6254:1	different	diligence	2	6065:1,9,1
6265:5	6020:5	dip 6117:6	6064:2,18	6
6274:8	6021:17	6046:4	6066:10	6068:5,6,1
6284:20	6028:1,2,4	6061:13	6067:2	4,20
6285:4,19	,21	direct	6103:12,21	6073:8
6286:19	6032:3,16	6151:7	6104:10,12	6074:18
6287:8,20,	6034:9,11	6260:3,9	6276:4,6,1	6076:3
22 6301:25	6047:4,19	6267:10	0 6278:3,4	6078:5,7
6304:13	6048:9,10,	6284:9	6282:7	6083:3,7,2
6311:20	15 6056:8	6294:6	6283:25	3 6089:5
6312:9,18	6057:2	6297:1	discounted	6090:10
6314:1	6059:10,18	6301:20	6266:22	6091:23
Diana 6034:8	6061:1	6316:25	6269:7	6093:16,17
6035:1	6063:4	6317:13	discounting	6096:9
6049:4	6068:9	directed	6273:21	6101:18
6068:11	6080:1	6065:20	discreet	6107:23
6094:16	6081:15,16	6076:17	6103:7	6149:9
6121:17	6085:6	direction	discrete	6186:4
6126:16	6095:4	6028:7,14	6094:12	6206:11,14
Diane 6020:2	6097:1,5	directionall	discu 6065:8	6226:2
diff 6181:12	6101:10	directionall	discuss	6265:8
differ	6111:13	y 6090:4	6049:7	6278:19
6166:1	6124:19	directly	6084:18	6290:17
difference	6130:17	6123:7	6088:6	6295:9,10,
6043:25	6137:7	6129:14	6126:2,24	17 6297:2
6069:21	6171:3	6186:19	6212:10	6306:18
6104:5	6193:23	dis 6094:25	discussed	6307:3
6140:15	6196:5	6278:2	6061:9	6309:20
6167:3	6209:17	disadvantage	6087:5	discussions
6170:8	6211:5,21	6110:6	6112:13	6046:15
6171:18	6233:5	disadvantage	6125:10,14	6062:21
6172:2	6251:19	s 6021:15	6292:8	6063:3
6173:1,6	6253:13	disagree	6295:18	6065:23
6180:21	6256:5,6,1	6212:5	6299:5	6101:14
6181:3,5,1	4,15	disagreement	discussing	6106:4
6181:3,5,1	6270:2	6195:7	6283:16	6248:8
3	6272:10,12	disarray	6301:11	6293:22
6184:12,15	6288:21	6144:14	discussion	discussion's
6192:5	6289:3	disaster	6021:8	6318:7
6200:4,20,	6290:6	6144:19	6025:11	disks 6238:5
25	6291:12	6145:7	6029:21	display
6201:8,19,	6293:1	disclosed	6030:1	6291:1
20 6222:24	6304:18,21	6080:11	6040:14	dispose
6223:18,22	6312:1,3		6042:10,13	6271:3
6226:4	6318:6		6047:2,7	dispute
6233:22	differently			6315:13
6256:8	6047:5			distinctive
6289:20	6153:16			
6292:1				

6138:10	6160:22	6303:6	dotted	drought
distribution	6164:1	domain	6121:25	6022:12
6031:13,22	6165:3	6054:20	6123:1	6026:3,4
,24	6166:8	domestic	6226:5	6153:5
6032:22	6169:24	6022:25	6284:13	6154:11,13
6035:15	6177:19	6025:18	6285:2	6155:17,19
6053:25	6178:12	6115:7	double	6156:5
6054:7,19,	6180:3	6126:7	6149:9	6160:12
25	6186:6,8	6166:4	6168:25	6180:23,24
6277:11,19	6188:1	6167:3,5	6185:14	6181:7,10
6290:15	6194:8	6171:4,16	6218:25	6182:5,14,
diversity	6198:10,22	6174:9,12	doubt	20 6183:20
6024:7	6199:6	6177:23	6291:24	6184:6,20
6119:15	6215:25	6179:19,22	6305:3	6204:1
6217:16,18	6229:19	6180:5	6318:23	6223:19
6218:4	6230:18,19	6182:22	Douglas	6224:3,4,1
divided	6236:17	6184:7,8	6015:7	9 6225:21
6174:12	6237:5	6185:19	Dr 6016:14	6226:2
division	6240:3	dominated	6083:25	6228:5,13
6153:9,10	6242:18,19	6240:16	6133:16,17	6311:1
document	6257:10	dominates	6134:22	dry 6022:14
6029:19	6264:14	6073:20	6145:18	6077:12
6051:10	6266:1,17	done 6034:2	6147:14	6181:13
6108:25	6281:22	6036:18	6149:6	DSM 6027:12
6149:19	6282:5	6046:24	6152:17,23	6029:13
6152:4,6	6283:18,22	6048:7	6204:9	6036:10
6168:11	6284:13	6057:3	6260:3,9,1	6069:15,16
6177:12	6290:2,3	6059:23	0,18	,19
6190:22	6294:5	6060:17,22	6264:22	6070:3,7,1
6191:5	6296:9,25	6067:20	6284:17	0,17,20
6192:4,24	6301:19	6073:2	6286:15	6071:8,11,
6193:10	6306:3	6076:1,15	6297:3	14,16,17
6227:18	dollar	6078:11	draw 6029:20	6072:23
6283:15	6245:1	6102:16	6143:18	6073:24
6296:9	dollars	6110:15	6234:16	6074:8,22
6304:20	6036:5	6146:3	drawn 6254:6	6075:17
6307:16	6108:14	6156:15	drew 6084:12	6076:24
documentatio	6136:22	6194:17	dries 6181:9	6077:17
n 6261:22	6137:7	6242:10	driest	6078:19
6313:24	6138:24	6266:14	6163:12	6079:11,13
documented	6140:7	6290:3	6164:13	,19,21
6136:6	6144:15	6292:6	6165:20	6080:25
documents	6230:6,17,	6299:4	driver	6081:4,12,
6017:20	23	6307:1	6207:19	17
6018:6,10	6231:6,7,1	6308:12	drivers	6082:2,9
6132:2	7 6232:6	6316:17	6096:13	6086:19,20
6138:4	6233:1,8,2	6317:13	driving	,21,24
6139:13	3,24	6319:4	6074:6	6087:4
6150:2,8	6235:6,23	Dorsey		6093:25
6152:4	6238:8,9	6252:10		6106:6
	6239:6,7,1	6253:2,8		6125:11,12
	1 6274:18			6130:16
	6302:9			6167:5

6180:6	dysfunction	econ 6029:1	6265:11	6201:4,5,1
6205:8,15	6144:15	econo	6289:3	4
6206:2,4,9		6059:16	6297:3	6224:17,20
,14,23	<hr/>		6298:14,19	6285:22
6207:8,13	E	economic	6302:14	6297:24
6294:10,11	earlier	6017:17	6308:13	6302:18
,25	6053:4	6029:9,12	ED 6148:22	eighty
6295:3,19,	6055:22	6059:4	6149:2,12	6201:15
24 6296:17	6078:5,7	6069:10	effect	eighty-five
6297:9	6093:16	6070:15	6032:25	6035:13
6298:10,15	6151:6	6074:11	6130:18	6036:17,19
,21,23	6185:18	6079:15	6161:4,19	eighty-two
6299:7,14	6187:4	6090:17	6163:2	6200:5
6300:17	6226:2	6094:14	6200:1	either
6301:1,21	6227:1	6095:6	6212:5	6023:21
6302:1,4,5	6228:23	6097:17	6253:22	6037:22
,8,12	6229:10	6108:23	6286:25	6056:20
6303:4	6290:22	6111:10	6313:12	6058:13
6304:18,20	6294:9	6116:13	effective	6089:4
,25	6309:21	6130:9	6178:24	6129:16
6305:10,15	6311:7	6140:11	6200:13	6162:19
,19 6312:2	6317:7	6142:3	effectively	6267:22
due 6046:3	earliest	6149:21,25	6022:11	6268:9
6061:13	6025:4	6205:2	6073:3	6314:18
6197:24	6052:3	6232:18,25	6204:11	elected
6199:12,14	early	6233:18	6286:16	6292:2
6200:1,14	6069:11	6234:6,21	effects	electric
6210:13	6296:5	6265:5	6130:20	6070:23
6294:14	6316:18	6270:15	6145:14	6198:11
dug 6029:6	6317:24	6271:24	6269:22	6272:13
during	6318:3	6272:19	6284:18	electricity
6025:25	easier	6273:5,7	6304:21	6085:2,19,
6026:4	6082:1	6292:9	6312:3	21 6086:11
6119:20	6218:3	6300:21	efficient	6114:16
6120:4,14	easiest	6301:2	6112:3	6128:18,24
6121:4	6093:19	6315:18	efficiently	6187:5,8
6123:24	6225:15	economics	6153:2	element
6124:15	easily	6021:10	effort	6067:24
6146:24	6127:10	6028:10,17	6143:6	6143:17
6162:25	east 6212:23	6029:1,19	6295:15	6311:13
6164:24	6252:12	6031:17	efforts	elements
6166:5	6253:1,24	6058:25	6136:25	6072:11
6171:17	6258:17,24	6059:3,16	6138:4	6075:11
6177:24	eastern	6062:7,15	eggs	6094:5
6206:1	6252:9	6073:4,25	6160:6,11,	6274:13
6228:5,13	easy 6037:23	6074:5,14	13	elevated
6248:7	6038:12,18	6076:20	eight 6052:4	6124:9
6274:8,14	6057:5	6077:8,14	6097:21	eleven
duty 6239:20	6058:19	6090:4	6200:5	6035:18
dynamic	6110:17	6092:13		
6077:11		6135:7		
		6204:21		
		6232:13		

eliminate 6279:11	6283:12	6194:11,16	6172:20	essentially 6027:11
eliminated 6279:3,12	energy 6032:22	6195:13,20	enhanced 6071:23	6031:13
eliminates 6040:3	6062:3,10	6196:2	ensure 6086:20	6041:5
eliminating 6279:6,11	6064:18	6197:7,18, 20,22	6152:11	6130:14,23
elite 6144:16	6066:9	6198:1,5	6158:19,20	6148:13
eloquently 6194:22	6120:5,12	6200:2	6178:22	6159:12
else 6021:19	6121:2	6202:8	entered 6148:15	6164:7
6022:22	6124:7,8,1	6203:18,24	entertain 6157:25	6252:9
6041:24	0 6128:4,5	6204:3	entire 6314:12	6253:2,24
6069:25	6129:23	6207:20	entitled 6257:19	6254:2
6300:14	6153:7	6217:5,23	environment 6028:10	6268:3
6319:15	6154:21	6218:1,5,9	6141:20	6291:5
elsewhere 6286:5	6155:5	6219:4,20	6145:21	est 6041:19
email 6306:2,10	6160:2	6220:14	6146:15	establish 6157:11,13
embedded 6121:11	6162:9,12, 13,17,22,2	6221:6,7	equal 6071:16	6228:3
6207:8	3	6222:8	6161:17,19	established 6087:1
6276:10	6164:20,24	6223:14	equivalent 6031:14	6091:5
emerged 6089:11	6165:5,8,1	6224:5,9,1	6035:16,17	6173:20
employees 6141:19,25	8,21	4,16,17	6182:15	6177:5
6144:25	6166:21	6225:20	6294:24	6180:5
employment 6146:1,10	6167:3,5,2	6226:17	erase 6139:22	6186:24
enable 6121:23	4 6168:4	6227:2,5,8	Eric 6208:22	6194:2
6122:25	6169:11,14	6228:7,16, 22 6229:9	errata 6017:15	6217:10
6123:10	,19	6236:10	6132:4,16	6227:1
enacted 6291:8	6170:9,12	6245:13,23	error 6108:11	establishes 6171:18
encompassed 6093:10	6171:2,16, 19	6281:20	6136:2,9	6172:2
endeavoured 6067:3	6172:3,4,6	6282:25	essentially 6068:16	estimate 6031:22
end-of-life 6272:5	,7 6173:2	6283:21	6272:9	6041:19,20
endorsement	6174:13,22	6295:8	essence 6256:13	6048:7
	6175:5,7,1	6308:5	6269:15	6307:3
	6,18	6309:8,13, 14	essential 6112:24	6316:8
	6176:4,17, 19,24	energy/ market 6170:18		estimated 6026:16
	6178:4,19	Energy's 6283:13		6059:9
	6179:1,19	engage 6120:21		6063:23
	6180:5,11, 16,22,23,2	6131:4		estimates 6039:12
	5	engaged 6089:9		6041:6,10
	6181:1,2,7 ,17	6138:18		6043:7
	6182:1,5,7 ,8,15,20,2	6139:22		6044:12,21
	3	6268:19		6045:17
	6183:7,12, 14,16	engaging 6127:16		6046:11
	6184:6,7,8 ,12,13,16, 17	English 6170:25		6047:8,9
	6186:20,25			6048:1
	6187:1			6051:2
				6055:7

6056:11	6132:23	6284:10	6204:18	6280:1
6057:12	6242:25	6294:6	6239:18	exercised
6060:13	6263:25	6297:1	6246:18	6023:17
6062:23	6311:8	6301:21	6270:19	exhibit
estimating	everybody's	6309:7	6285:11	6017:2
6037:18	6042:11	6312:25	6311:2	6018:14,17
6292:24	6133:7	6313:9	examples	,18,23,25
estimation	6292:18	6314:21	6106:4	6019:1,3,5
6041:13	everyone	6317:13	6193:17,22	,7,9,11,13
6062:25	6136:5	6318:18	,24	,15,17,19
etched	6208:1	evile	exceed	6020:3
6292:18	6300:11	6262:18	6163:1	6029:21
ethics	6319:18	evolves	exceeds	6037:4
6142:6	everyone's	6055:25	6161:11	6042:22
evacuate	6018:5	exact 6272:5	excellent	6051:9
6025:24	6214:19	exactly	6163:9	6068:12
evaluated	everything	6024:14	Except	6078:17
6105:19,25	6047:15	6072:3	6069:1	6081:3
evaluating	6054:19	6196:22	excerpt	6084:3
6265:22	6079:8	6236:2	6169:6	6094:16
6269:21	6172:12	6244:12	6177:20	6097:25
evaluation	6185:5	6272:21	6198:10	6103:12
6017:18	6300:14,25	6295:3	6242:20	6105:12
6126:25	everywhere	6296:14	excerpts	6108:21
6149:21,25	6147:2	6301:15	6266:17	6115:2
6265:5	evidence	6313:11	excess	6116:8
6311:17	6026:9	6315:24	6025:18	6121:15,16
6313:25	6037:2	examination	6119:12	6126:1,24
evaluations	6066:21	6152:2	6154:8	6132:16
6311:22	6094:23	examine	exchange	6148:10,15
evening	6166:19	6300:7	6024:7	,17
6319:18	6168:24	examined	6152:17	6149:20,22
event	6187:14	6076:12	6153:19	,24
6162:13	6190:9,18	examining	6204:9	6150:4,7,1
6163:12	6191:1,4,1	6046:18	exchanges	5 6151:1
6164:13	1	6076:2	6248:8	6250:20
6184:21	6193:14,17	example	exclude	6260:4,5
6217:3	6208:11,20	6075:24	6068:22	6261:14
6261:19	6209:7,12,	6076:5	Excuse	6262:10
6262:1,16	21	6081:6	6108:24	6264:10
events	6211:4,10,	6091:3,23	6122:1,6	6265:2
6203:24	16 6212:15	6092:1	6277:24	6276:16
6204:2	6260:3,9,1	6093:24	exercise	6301:20
6273:22	6	6111:12	6028:12	6312:24
eventually	6262:6,19	6123:9	6031:8,18	exhibited
6253:20	6264:23	6128:4	6059:5	6261:23
everybody	6265:1	6129:11	6108:15	exhibits
6083:16	6267:11	6162:4	6125:3	6016:3
	6268:22,24	6166:2		6017:1
	6269:3	6196:18		6111:3
	6276:15			exist
				6022:15,21

6123:13	expend	6021:6	6217:17	6150:24
6140:3	6028:24,25	6121:9	extensions	<hr/>
6306:21	expenditures	6165:1	6217:18	<hr/> F <hr/>
existence	6274:17	6186:23	extensive	face 6199:24
6022:9	expense	exploring	6248:15	6248:21
existing	6274:9	6074:12	extensively	facilitate
6120:12	expenses	export	6145:20	6260:13
6121:2	6081:4	6021:14	extent	facilities
6123:11	experience	6022:18,20	6022:15,18	6022:19
6139:6	6144:3	,24	6023:1	6025:18,25
6153:1	6146:2	6024:21	6058:17	6043:5
6219:2	experiences	6025:16,23	6076:14	6046:18
6227:23	6144:13	6027:21	6077:7	6049:12
6228:10	6161:10	6033:13	6080:10	6058:16
6229:12,14	expert	6062:3,16,	6081:1	6129:6
6258:2,9,2	6044:10	18	6097:11,23	6259:13,24
1 6267:6	6082:13	6077:12,23	6113:23	6260:14,23
exists	6264:22	6078:2	6154:7	facility
6143:5	expertise	6120:6	6176:18	6054:14
expand	6102:10	6121:24	6246:6	6055:5
6023:3	6247:11	6122:25	6269:9	6259:15
6215:17	experts	6123:11	external	facing
expanded	6062:11	6161:4,19	6193:18	6316:20
6023:4	6065:23	6163:2	6207:21	fact 6089:18
6024:7	6066:19	6164:21	6232:2	6096:20
6229:2	6067:10	6209:19	extinguishme	6115:12
6298:15	6091:16	6293:15	nt 6137:12	6135:21
expanding	6102:24	6308:18	extract	6136:22
6298:10,21	explain	6312:13	6080:13	6137:1,10
expect	6044:23	exportable	extraordinar	6138:14,16
6039:7	6086:4	6124:7	y 6144:19	6141:6,10
6156:19	6278:13	exports	extreme	6166:3
6203:8	6291:23	6123:10,24	6057:19	6177:21
6275:18	6310:24	6124:1,11,	6089:5	6183:13,15
6317:19	explained	15	6161:12	6202:6
expected	6036:14	6220:3,8	6201:21	6211:15
6032:4	6301:7	6224:7	6203:25	6228:15
6034:21,25	explaining	6260:21	6277:15	6232:6
6035:12,22	6196:2	expressed	6279:4,12	6250:4
6036:4,16,	6283:5	6118:21	extremely	6256:11
25 6037:3	explanation	6185:18	6105:3	6283:5
6039:3,8	6021:6	expression	6199:19	6286:7
6073:19	6034:9	6290:23	6281:4	6292:17
6208:3	6059:24	extended	extremes	6300:4
6288:24	6262:25	6203:25	6200:2,14	6310:2
expects	explicitly	6215:9	6277:11	factor
6046:25	6204:3	extending	6279:12	6035:14
expediency	explore	6218:4	eye 6142:14	6241:23
6094:4		extension		factors
				6020:25

6061:10,14	6089:10	6186:21	6239:10	6042:19
6240:24	6166:23	6194:13	6268:1	6070:9
6241:10,17	6187:2	February	6285:21	6080:4,7
facts 6257:2	6202:5	6105:13	fifty-eight	6088:19
fail 6136:7	6210:20	6113:18	6286:1	6113:18
6202:25	6216:21	Federation	fifty-five	6132:5
failure	6238:23	6117:22	6035:19	6149:22
6203:1	6253:17	fee 6091:4	6036:21	6190:17
fair 6054:23	6259:8	6092:10	6286:3,11	files
6058:9	6260:16	6100:8	6287:13	6249:23
6061:17	6264:12,19	6101:5	fifty-four	filing
6064:15	6266:11,13	feed 6063:1	6034:25	6034:17
6084:5	6281:24	feel 6112:1	6036:22	6035:1
6104:6	6282:14,17	feeling	6039:17	6036:4
6111:15,24	families	6105:14	figure	6049:3,16
6112:7	6144:5,7,8	fees 6024:12	6031:21	6068:23
6128:17	fancy	6091:11	6039:19	6247:22
6130:19	6150:21	FELCC	6040:6	6275:24
6148:3	fared	6169:9,11,14,18	6075:12	6289:16
6160:14	6020:5,7	6170:3,10	6077:18	filings
6162:2	Fargo 6253:9	6176:12,16	6121:14,18	6088:23
6179:12	fashion	felt 6053:1	6122:21	6089:16
6181:11	6141:2	6062:14	6123:2	fill 6166:5
6204:14	fast 6120:22	6068:2	6153:23	6171:5
6240:15	6319:4	6112:18	6224:11	6215:17
6279:13	faster	FERNANDES	6232:25	final
6282:21	6232:24	6109:19	6235:5,23	6123:20
6288:19	6247:5	fewest	6236:11	6261:6
6297:11,12	favour	6236:21	6237:6,15,21	6280:2
6314:13	6291:11	fifteen	6240:5,23	finally
fairly	favourable	6134:4	6243:9,10,17	6126:23
6028:16	6314:23	6238:8,10	6254:19	6253:16
6099:21	fear 6316:2	fifth	6284:24	finance
6133:24	feasibility	6167:9,11,12	6285:7	6264:13,16
6134:18	6209:1	6198:14,23	6287:3	finance-related
6295:24	feasible	fifty	6290:3	6274:5
6296:3,4	6110:19	6035:18	figures	financial
6315:22	6208:13,24	6038:25	6167:4,16,18	6085:9
fairness	6209:8,10	6039:1	6245:4	6103:11,20
6297:5	6228:14	6040:10,22	6246:25	6114:3
fall 6031:21	feature	6086:6,8	6284:8,18,19	6116:1
6050:11	6195:19	6095:19,22	6289:7	6134:8
6067:20	featured	6096:21	6290:1,4	6135:11
6238:7	6077:20	6116:3,4	6305:22	6139:18
6241:10	6087:17	6235:5	file	6272:25
falls	features	6236:7	6132:3,6	6275:25
6031:24	6075:1		6249:23	financials
6058:11			filed	6150:20
6102:21				
familiar				

fine 6192:15 6282:22	6116:19,25 6118:16,17 6124:23 6125:4 6135:21 6137:8 6138:11 6141:21,24 6143:12 6144:22 6145:1 6148:7,9 6150:3,7 6160:20 6163:5 6165:13 6172:22 6190:1,22 6191:5 6205:16 6216:11,24 6217:9 6231:4 6250:22 6273:3 6276:3 6299:8 6305:18 6306:18 6313:18 6314:23	fixed 6055:2 6245:12 fixed-end 6245:24 fixed-price 6055:2 flagged 6108:17 flat 6244:15 flexibility 6021:13 6022:4 6026:11 6028:7 6078:8 flip 6286:17,24 6287:21 flipped 6275:9 6287:3 flipping 6108:21 6179:13 Flood 6139:3,4,1 5,23 6140:3 flow 6163:12 6164:13 6165:21 6171:5,17 6177:25 6185:4 6220:19 6221:12 6225:20 6227:7 6243:13,18 19,23 6244:5,6,1 0,24 6245:20,21 6246:21 6254:12 6255:19 6257:3,19 6266:23 6269:8	6271:4,16, 17,24 6272:8,22 6309:18 6311:1,5 flowing 6145:14 flows 6256:23 6267:22 6310:6,8 Flynn 6225:15 Flynn's 6157:11 focus 6081:2 6097:2 focussed 6253:21 focussing 6271:24 folks 6112:1 footnote 6191:18 6192:1 6218:25 6283:4,23 footprint 6213:14 forced 6091:8 6203:1 forecast 6030:6,10 6042:12 6094:22 6114:6 6115:15 6161:1,2,1 1 6197:4,10, 20,25 6198:5,11, 12,22 6199:1,5,2 5 6207:8 6294:14,20 22,24,25	6295:24 6296:23 6303:24 forecasted 6115:9 6161:17 6174:18 forecasts 6025:8 6032:1,16 6059:17 6113:25 6273:18 foreclosed 6021:23 forefront 6038:7 forget 6081:17 6300:9 forgot 6242:19 form 6150:23 6206:14 formally 6151:23 former 6049:20 6135:1 forth 6087:9 6105:11 6288:17 forty 6116:4 6141:10 6144:23 forty-eight 6182:25 6241:5 forty-five 6132:20 forty-one 6173:1,4,5 6175:20 forty-two 6237:25 6238:25 forward
finish 6249:25 6318:9 finished 6056:6 6063:18 6271:7 finishing 6316:13 firm 6076:6 6096:17 6118:5,11 6119:11,12 20 6120:11 6121:1,22 6122:23 6124:10 6154:6,8,9 6156:16 6157:2,25 6158:3 6162:13,18 6169:11 6182:22 6183:16 6198:1 6200:2 6207:20 6213:17 6214:5 6219:2 6224:8 6227:23 6228:10,12 6262:17 6268:22 6309:8,14, 15 first 6017:19 6021:16 6026:23 6042:24 6069:6 6076:20 6087:21 6101:8 6102:2	firstly 6026:14 6072:22 fiscal 6170:7 6179:4 fits 6023:13 6104:23 five 6027:12 6029:2 6087:1 6106:23 6130:12 6131:2 6132:22 6207:7 6263:18 6283:24 6302:17 6313:2 6316:4,13			

6029:15	6125:11,12	gained	6303:5,15	6217:11
6055:21	6205:8,16	6257:5	6304:6,15,	6218:21
6062:8	6206:8,12,	Gange	24	6220:15
6073:17	18,23	6015:13	6305:10,14	6221:5,18,
6074:24	6207:13	6124:19	,25	24 6222:23
6095:14	6294:15	gas 6034:12	6306:1,3,1	6228:4
6130:7	6295:4,19	6035:20,21	2 6308:14	6248:13
fourteen	fuel-	6036:15	6312:10,19	6251:12
6238:14	switching	6069:22	,22	6256:5,14
fourth	6081:5	6070:9,23	gener 6300:7	6266:21
6167:8	6082:9	6083:23	general	6294:19
frame 6095:1	6298:11	6084:5,6,1	6193:2	6295:20
6097:2	fulfil	3	generalized	6296:2
6154:16	6171:17	6085:2,10,	6066:4	6297:4,15,
6155:17,22	fulfill	19,20	generally	19,24
6157:14	6065:20	6086:6,10	6146:12	6298:10,20
6270:13	6166:5	6106:5	6163:13	,25
6302:20	6177:24	6127:6,8,2	6164:14	6300:8,12,
6318:10	fulfilled	1	6268:17	14,18
Frank	6142:15	6128:20,25	generate	6306:20,25
6143:24	full 6031:19	6243:12	6091:23	6308:4,23
frankly	6048:19	6244:22	generating	6311:22
6083:2	6059:23	6284:11,14	6094:25	Generation-
free 6303:25	6255:20	,19	6119:12	weighted
freedom	6257:3	6285:12	6120:13	6241:16
6153:9,13,	6270:14	6286:20	6121:3	generators
21	fully	6287:12,19	6165:22	6121:23
fresh	6195:15	,23	6187:9	6122:24
6248:21	fundamental	6288:4,5,1	6202:25	generous
friends	6033:3	3,20,25	generation	6139:11
6247:5	6099:21	6289:4,18,	6025:23	gentlemen
frivolously	6107:11	20	6052:20	6061:6
6215:19,21	fundamentall	6290:14,25	6068:17,22	George
front	y 6089:10	6292:15	6069:22	6015:18
6130:20	6193:23	6293:24	6070:13	6016:11
6163:17	future	6298:23	6071:12	6113:9,12,
6277:7	6052:5	6299:16	6073:9	13,14
frost	6117:13	6302:13,16	6075:19,20	6114:23
6249:17	6142:8	,24	6076:19	6115:1,22
fuel 6070:22	6145:24	6303:12	6077:4	6116:6,22
6071:12	6266:24	6305:8,11	6080:9	gets 6311:10
6075:20	6270:20	6312:12	6081:6	getting
6076:25	6273:22	6313:25	6107:5	6105:15
6078:21		6314:22,23	6118:6,11,	ghost 6142:6
6079:13		,24	17,23	gigawatt
6082:2		gas-fired	6119:19	6167:6,13
6087:2		6107:5	6125:13	6168:15,18
6094:1		Gen 6075:19	6127:19,21	6170:7,11,
		6077:20	6152:11	15 6171:20
		6093:7	6157:12	6172:3
		6299:15	6204:8,10	
		6301:7,14		

6173:21	6153:13	6297:18,23	6046:9	6034:7,14,
6174:5,6,1	gives	6298:14	6047:2	20,23
1,12,23	6021:13	6305:10	6058:5	6035:6,11,
6175:10,15	6022:13	graphic	6059:22,25	24
,16,17	6028:3,4	6286:17	6069:2	6036:2,8,2
6176:2	6153:8	graphical	6072:8	4
6179:4,18	6261:4	6188:16	6074:7,10	6037:8,16,
6180:6,11,	6273:22	graphically	6077:4	24 6038:10
17,25	giving	6237:24	6090:23	6039:25
6181:1,2,8	6134:1	graphs	6092:7	6040:1,12
,18	6268:22	6033:17	6123:6	6041:8,9,1
6182:1,6	Glad 6312:16	great	6150:12	7,18
6187:1	glean 6123:7	6036:13	6172:8	6042:1
6200:15,16	goal 6272:18	6087:13,20	6177:11	6043:11,14
,19,21	gone 6184:5	6088:13	6181:4	,17,24
6201:9,21	gos 6166:16	6089:1,6,1	6182:18	6045:2,24
6202:7,8,2	Gosselin	4 6296:16	6195:23	6046:3
1 6203:18	6014:13	greater	6218:7	6048:24
6221:18	gotten	6185:19	6231:19	6050:11
6222:22	6029:8	green	6233:11,20	6051:8
6223:10,12	6074:3	6258:15	6258:25	6057:13
,21	government	grey	6300:1	6059:13
6225:9,17	6136:24	6220:1,6,7	6316:9	6061:5,20
6226:11,16	6138:1	6221:4	guide 6065:8	6064:13,14
,18	governments	grid 6020:11	guided	6066:5
6227:4,7,2	6135:12	gross 6200:2	6241:21	6068:4
4	governs	ground	guys 6159:13	6069:1,12
6228:6,11,	6154:18	6038:17	Gwich'in	6071:9,22
12,25	Grant	group	6137:18	6072:14
Gillam	6014:17	6133:22	<hr/>	6078:15,16
6141:18	6083:25	6135:23	H	6079:5,18,
6144:1	6284:17	6149:22	<hr/>	22
6146:22	6286:15	6157:11,13	Hacault	6080:3,8,2
given	granularity	growing	6015:16	1
6033:15	6111:4	6210:13	6016:10	6081:20,25
6059:23	graph 6034:4	guarantee	6018:8,9,1	6082:7,24
6071:14	6040:14	6091:3	9	6083:20,21
6075:9	6072:16	6092:10	6020:1,2,1	6084:10
6080:15	6085:14	6100:8	0,13,17,18	6086:1,14
6090:13	6086:5	6101:5	6021:20	6087:12,18
6091:7	6219:21,25	guaranteed	6023:7	6088:2,12,
6092:1,2,4	6220:1	6091:11	6024:23,24	21
,20	6234:16	guess	6025:12	6089:1,13
6095:19	6241:4	6023:13	6026:6,21	6090:2,11,
6113:21	6244:3	6024:13	6027:17	13
6115:13	6258:1	6026:18,21	6028:22	6091:1,19,
6119:22	6287:21	6035:11	6029:18	21,22
6180:23			6030:15,20	6092:11,15
6250:4			6031:2	6094:10,11
6276:24			6032:9	6095:18
6316:19			6033:2,10,	6096:25
givens			24	6097:22
				6098:9,12,
				13,20,21

6099:1,13, 17 6100:6,15, 22,23 6101:25 6102:12,13 6103:6,19, 24 6104:4,14, 19 6105:8 6106:10,18 ,19 6107:9,16, 18,19 6108:2,9,1 3,20 6109:1,5,1 0,13,16,21 ,23,24 6112:7,21 6113:5 6295:18 Hacault's 6073:22 half 6070:19 6071:11 6078:20 6079:13 6214:13 6216:9 6317:11 halfway 6274:1 Hampshire 6266:2,4 6268:9,12 handed 6148:5 handwriting 6036:13 hang 6050:20 6318:3 happen 6054:15 6136:14 6145:23 6203:13 6246:19 6305:16 happened	6045:11 6059:19 6146:5 happens 6279:5 6311:17 happy 6060:8,15 6146:22 hard 6048:7 6092:16 6132:9 hardware 6310:2 6311:10 hate 6247:7 have-nots 6142:2,4 6143:15 haven't 6028:6 6029:6 6039:20 6048:7,11 6058:12,13 6080:1 6089:5 6093:12 6133:20 6177:1,4,7 ,12 6193:10 6209:6 6210:22 6212:3 6242:10 6286:7 6312:21 6315:15 haves 6142:2 6143:14 having 6022:17 6032:6,15, 17 6078:5,7 6112:4 6115:20 6133:18 6156:19	6209:6 6310:1 6317:21 head 6034:25 6140:9 headed 6188:10 headroom 6022:18 heads 6159:14 hear 6067:10 6097:12 6247:7 6317:14 heard 6097:19 6114:6 6130:6 6151:25 6182:13 6199:21 6208:21 6209:7 6210:8 6317:21 hearing 6028:21 6042:11 6048:25 6080:5 6083:17 6094:23 6113:23 6208:21 6317:9 hearings 6141:21 6262:23 heat 6070:23 heavily 6165:19 hedging 6022:12 HELD 6014:20 Helga 6015:8 he'll 6316:24	6317:1,2 help 6031:2 6157:7 6175:25 6178:11 6196:1 6319:2 helpful 6179:7 6267:13 6291:23 6318:24 helps 6078:12 6129:24 6158:12 6215:14 6295:5 heritage 6170:3,9,1 3,16 6176:3 6178:19 6179:1 high 6026:1,17 6030:9 6038:25 6040:3,16, 22 6041:19,23 6042:7,15, 16 6043:14 6044:3 6045:5,8,1 0 6046:7 6047:25 6048:6 6051:20 6052:6,16, 25 6053:13 6055:10 6056:14,15 ,25 6059:5,18 6060:22 6063:12,21 6064:3,7 6081:17 6083:3 6104:12 6105:4	6140:24 6155:18 6195:16 6277:22 6278:4,10, 14 6279:11 6281:7 higher 6038:22 6039:8 6053:11,17 ,20 6056:13,15 6058:22 6059:1,9 6060:11 6085:24 6086:10 6116:21 6117:2,12, 13 6123:23 6158:10 6203:3 6234:12 6283:6 6288:6 6299:1 6314:25 highest 6241:17 highs 6042:7 6044:3 6046:8 6057:22 6058:2,3,2 2 6061:25 hired 6090:1 historic 6184:21 historical 6138:17 6165:20 historically 6138:7 history 6053:19 hit 6228:24 Hombach 6015:3
--	--	--	--	---

home 6151:10	6223:10,12	Hunter	6128:7	6192:17
hope 6105:13	,21	6192:4	6130:6,11,	6193:19,23
6159:17	6225:9,17	hunting	14	6194:17
6263:6	6226:11,17	6144:4	6131:5,7,1	6195:25
hopefully	,18	hydro 6014:7	9 6135:14	6196:5,8,1
6094:24	6227:5,7,2	6015:5	6138:6	7 6199:1
6134:15	4	6020:3,20	6141:11,18	6202:6
6192:10	6228:6,11,	6022:14	,25	6203:19
6215:8	12,25	6028:21,24	6142:9,11,	6207:1
6250:14	6316:16	6029:14	18 6144:21	6212:9,25
6272:5	6317:11	6030:9	6145:12	6213:1,3,1
hoping	house	6031:11,20	6146:25	8 6214:6
6193:21	6270:21	6034:2	6147:4	6215:7
6250:11	6271:1,19	6035:15,23	6148:8,10,	6216:25
6318:19	houses	6037:20	11,12,15	6217:11
horizon	6141:19,25	6039:14	6149:19	6219:19
6094:21	6144:24	6043:2	6150:2,4	6220:19,20
6154:2	6145:1	6045:7	6151:25	6221:13,17
hot 6199:12	housing	6053:5	6153:1	,24
hour 6159:7	6141:16,22	6054:10	6154:1,13	6222:23
6214:13	huge 6136:24	6058:6,13	6155:21	6224:14
6233:9	6145:4	6063:9,13	6157:25	6225:6,7
hours	6146:18	6069:9	6158:18	6227:3
6120:6,7	Hugh 6014:17	6070:14	6159:21	6228:4,6
6124:8	human 6142:6	6073:10	6160:23	6231:4,5
6167:6,13	hundred	6074:2	6161:10,16	6241:24
6168:16,18	6031:25	6078:18	6163:13	6242:6
6170:7,11,	6034:17,25	6079:16	6165:5,17,	6247:13,23
15 6171:20	6035:18	6080:15	19,20,22	,25
6172:4	6036:20,22	6085:17	6166:9,22	6248:6,11,
6173:21	6037:20,22	6086:13,21	6167:8,13	14 6249:21
6174:5,6,1	6173:1,4,6	6088:17	6168:14	6251:12
1,12,23	6200:5	6089:18	6169:8,17,	6253:25
6175:10,15	6201:1,15	6090:19	18	6254:9,13,
,16,17	6207:6	6093:17	6170:4,9,1	17 6255:8
6176:2	6230:6,17,	6094:4	3,17,20	6257:19
6179:4,18	23	6104:13,17	6173:20	6260:21,25
6180:6,12,	6231:6,7,1	6105:19	6174:22	6261:21
17,25	7 6232:6	6110:24	6176:3,23	6262:6,11,
6181:1,2,8	6233:1,8,2	6113:6	6177:22	14 6264:10
,18	3,24	6114:3	6178:19,20	6265:2
6182:1,6	6235:5,23	6116:16,18	6179:1,17,	6275:23
6187:1	6238:8,9,1	6118:20	22,23	6276:6,14,
6200:15,16	1	6119:3,11,	6180:10,16	17 6277:20
,20,21	6239:6,7,1	16,20	,21,22	6278:1
6201:10,21	0	6120:11,16	6181:17	6279:8,22
6202:7,8,2	hundreds	6121:1,6,2	6182:7,23,	6285:1
1 6203:18	6136:21	1,24	24 6183:17	6286:10
6219:3,6,8	6137:6	6122:22,25	6184:5,22	6287:2
6221:18	6138:23	6123:13,24	6185:4,8,9	6288:17,20
6222:22	6140:7	6124:5	,19,20	,24
		6126:5,18	6186:24	6290:25
		6127:3,21	6187:3,9	6291:25
			6190:6,7	6292:2

6294:18	6124:13	6294:4	6094:19	6068:9
6295:16	6126:16	6308:11	6127:1	6069:17
6296:1	6150:8	6313:16	6149:19	6082:15
6297:16	6152:8	6314:21	6150:3,9	6099:4
6299:6	6164:19	6315:8	6216:4	6103:14
6301:20	6165:4,7	hypothetical	6221:14	6108:21
6306:9,19	6166:19	6021:11	6230:5	6113:6
6309:2	6168:14,17	6025:6	6231:25	6120:21
6312:21	6169:5,6	6077:20	6248:5,6,1	6121:13,14
6313:16,18	6170:3	6092:24	1	6124:23,24
,24	6171:3	6297:7	identifies	6125:2,3,5
6318:19	6174:5	6309:2	6216:12	6132:23
Hydro/La	6179:2	6310:19	6237:11	6134:15
6236:6	6180:5,8,1	hypothetical	identify	6135:20
Hydro/LCA	0,16	ly 6308:12	6112:8	6145:22
6207:24	6181:16		6238:17	6147:25
6255:3,8	6182:14,16		6242:19	6152:4
	,19	I		6163:17,22
hydro-	6183:12	I'd	identifying	6167:17
affected	6185:13,14	6024:13,18	6248:10	6168:7,8
6141:6	6186:20	,19,25	Iderstine	6180:13
6142:16	6187:14	6029:19,25	6015:8	6181:19
6143:9	6189:16	6032:13	6247:10	6187:10
hydro-	6191:11	6039:20	6268:21	6190:19
dependent	6193:13	6042:9	IEC 6015:24	6203:21
6164:14	6194:11,16	6081:1,4,1	6016:5,16	6208:18
6165:10	6195:17	8	6019:21	6212:20
hydroelectri	6196:2	6082:2,25	6151:15	6252:6
city	6197:2,18	6113:10	6318:17	6264:1
6169:15	6198:11	6133:8	IECs 6097:12	6318:6
hydrology	6204:3,12	6148:4	Ignore	6319:11
6247:14	6205:10,18	6165:1	6245:24	illus 6114:7
Hydro-Quebec	6206:3	6166:7	ignored	illustrate
6193:19	6216:13	6218:18	6219:12	6219:22
hydros	6220:2	6222:12	ignores	illustration
6301:14	6221:4	6233:5,19	6185:5	6066:11
Hydro's	6222:7	6238:14	6267:21	6127:25
6014:9	6227:22	6254:4	II 6017:22	illustration
6017:19	6228:9	6259:4	6150:11,13	s 6114:7
6026:22	6229:24	6266:17	,15	I'm 6023:15
6033:12	6230:5,16	6270:21	6264:10	6024:12
6047:24	6231:4,25	6305:18	6283:18	6026:19
6050:3	6232:2	idea 6103:9	III 6017:23	6028:20
6054:1	6235:22	6104:15	6150:19	6029:16
6061:25	6244:5	6312:16	6151:1	6031:3
6071:14	6247:21	6317:1	I'll 6018:7	6033:12
6088:22	6252:10	identically	6039:21	6042:5
6110:4	6253:2	6305:3	6042:7	6045:3
6120:14	6257:9	identified	6057:13,14	6046:9
6121:4,22	6261:8	6017:20		6047:2
6122:23	6264:14,22	6067:4		6051:4
	6265:1	6090:21		
	6276:15			
	6291:14			

6053:16	6176:6	6290:1	import	6128:18,23
6057:19,21	6182:12	6292:24	6022:10	6162:25
6060:3	6183:10	6294:3	6023:3	6164:24
6066:15	6186:7,9,1	6299:20	6024:21	importing
6068:21	9 6187:6	6306:6	6071:23,25	6118:5,11
6080:22	6188:9	6307:15,17	6072:22	6156:1
6081:10	6189:2,6	,22 6310:6	6073:7	6209:25
6082:1	6190:9,15,	6316:4,9,1	6074:19,21	6213:8
6088:5,12	21,23	5	6075:17	imports
6089:3	6192:3	6317:4,9,1	6077:11,13	6026:4
6090:23,24	6193:1,21	0,25	6078:8	6076:24
6092:7	6194:8,9	6319:1	6093:9	6118:24
6094:11,24	6198:13,16	imagine	6118:2	6123:23
6095:15	,22	6201:24	6127:9	6125:11
6096:19	6200:8,10	6202:2	6129:10,12	6129:5
6098:11	6202:13	6239:24	,17,21	6154:2,4,8
6103:7,8,1	6205:13	immaterial	6153:5,7,1	6155:20
0 6105:15	6209:20	6107:14,20	5,18	6158:1,4
6113:6	6210:20	immediately	6154:6,13	6160:1
6114:11,23	6212:11,16	6143:25	6155:2,21	6162:16
6115:14	6213:4	immiseration	6158:10	6166:22
6116:24	6215:25	6142:9	6162:23	6167:20,22
6117:8	6216:18,20	impact	6174:23	6168:2,3,1
6120:17,22	6218:12	6030:2	6205:9,17	5,18,24
6122:14,15	6219:9	6073:3	6207:18	6169:5
,17	6220:5	6092:18,21	6208:12,23	6173:20
6124:21	6221:21	6093:1	6209:16	6174:5,8,2
6128:21	6222:10,20	6116:17,20	6218:19	1 6175:15
6130:19	,25	6143:18	6219:11	6179:18,23
6134:5,10	6223:6,8	6218:4,8	6227:4,23	6185:20
6138:11	6225:8	6308:18	6228:10	6189:17
6141:13	6226:14	impacts	6229:2	6195:13
6143:12	6230:14	6034:11	6297:9	6204:13
6145:22	6232:23	6134:13,14	6308:6,15	6205:11,19
6146:20	6233:20,25	6206:16	6309:17,25	6208:4
6151:24	6236:17,25	6247:13	6310:7,11	6210:4
6152:24	6239:8	6248:16	6312:13	6219:2
6153:11	6243:9	6270:8	important	6221:19
6155:2	6245:5,24	impediment	6062:14	6223:12,20
6157:8	6247:3	6208:6	6065:10	6224:2,7,2
6158:17	6248:20	implementati	6066:2	1 6225:13
6159:12	6249:2	on	6067:6	6226:6,7,1
6160:3	6250:11	6139:20,24	6075:15	1,19
6162:10	6258:4,12	implication	6077:12	6227:9
6163:9	6261:13	6114:13	6106:22	6228:13
6164:7	6264:9,19	imply 6064:1	6123:22	6308:7
6166:9,19	6265:16	implying	6136:24	6309:3
6167:11	6266:13	6183:17	6139:3	6311:4
6168:9,16	6268:17	imported	6215:4	6312:11
6171:9,14	6277:25	6023:2	6270:14	imposed
6172:10,17	6279:24	6124:8		6154:4
,18,21	6282:13			impossible
6173:10,22	6284:7			
6174:3	6289:12			

6030:11	6070:6	incorporate	6082:13	6250:4
6068:1	6074:8	6052:12,15	6101:12	industry
impressed	6087:4	6062:11	6102:5,17	6100:1
6145:23	6100:9	incorporates	indicate	6162:1
impression	6126:11	6057:11	6028:21	6195:2
6318:8	6127:5	6294:14	6116:13	infeasibilit
improbable	6166:18	incorporatin	6163:11	y 6209:2
6068:2	6219:1	g 6063:25	6192:17	inference
6281:4	6222:22	6294:25	6258:8	6234:15
improve	6226:17	incorrect	6268:21	inferences
6143:8	6230:4	6229:5,9	indicated	6288:2
6298:19	6235:24	increase	6126:19	inferred
6299:17	6236:15	6039:2	6195:9	6054:10
6308:13	6238:1	6064:6,7	6205:25	inflation
improved	6246:9,19,	6115:13	6206:3	6283:24
6077:8	22 6264:13	6117:5	6208:2	inform
improves	6266:16	6143:8	6211:19	6057:17
6073:25	6274:19	6160:25	6231:17	information
inc 6051:4	6275:12	6197:9,20	6258:6	6017:17
incalculable	6298:10,20	6198:4	6269:25	6020:21
6143:19	6305:22	6199:8,11	6275:17	6028:18
include	6306:9,11	6255:18	6276:4,17	6029:25
6062:15	6308:14	6258:22	6286:14	6030:3,16
6070:17	includes	6260:14	6289:6,25	6033:5,8,1
6072:4	6037:4	increased	indicates	6 6034:2
6074:1	6070:6,10,	6047:25	6040:15	6036:9
6116:2	22 6118:3	6053:9,21	6090:5	6038:4,8,1
6138:4	6125:11	6056:24	6124:7	3,15,17
6167:23	6127:18	6070:17	6168:14	6041:11
6168:4	6136:17	6071:25	6178:17	6042:19
6175:6	6176:23	6091:6	6181:17	6043:20
6197:8,18	6197:2	6254:14	6200:15,19	6048:12,18
6198:3	6213:23	6257:5	6217:10	6049:17
6206:18	6234:3	6294:10	6219:19	6050:13
6221:18	6235:10	increases	6220:25	6051:5
6223:11	6237:16	6115:8,16,	6237:25	6052:21
6235:13	6243:24	21 6197:3	6241:15	6053:1
6236:2	6275:5	increasing	6254:15	6055:13,25
6245:12,23	6283:23	6053:13	indicating	6056:16,18
6246:1	6291:15	6297:8	6262:25	6058:6,12,
6274:13	6293:9	6308:6	indication	21 6059:15
6275:8	6294:9	incremental	6293:5	6060:7,10
6293:15	6295:19	6246:6	indigenous	6062:11,15
6298:14	6306:4,5	6270:7	6135:1	6063:25
6303:4	6308:5	6314:25	6144:4	6065:19
6307:18,20	including	independent	individual	6074:8
included	6071:7	6030:18	6136:1	6076:1
6024:9	6106:23	6044:10	6238:23	6078:23,24
6056:4	6114:15	6062:9	indulgence	6080:12,14
	6170:4	6065:12		6082:11,17
	6298:11			

6087:9	inquiring	6194:20	6237:15,16	invest
6096:2	6190:23	intention	,23,24	6023:24
6097:19	insert	6132:21	6238:2,17	investigated
6098:4	6149:7	interconnect	6241:4,9,1	6210:23
6099:23	in-service	ion	8,23	investment
6114:18	6312:12	6227:24	internal	6021:3,4
6145:12	6313:2	6228:11	6158:4	6024:4,6
6149:10,20	inspection	6235:11	6267:12	6027:1
,24	6111:16	6251:11	6269:8	6037:6
6190:8,16,	installed	6254:11	internationa	6054:3
17 6207:24	6118:22	6256:3,11,	l 6253:25	6059:7
6216:1,2	6238:1	23 6257:6	interpret	6096:16
6261:23	6240:10	6258:2,9	6217:24	6098:4
6263:6	instance	6261:21	interpretati	6099:18
6278:23	6272:16	6297:9	on 6171:10	6292:15
6280:9	6311:1	interconnect	interpreted	investments
6289:2	instead	ions	6173:4	6096:13
6292:7	6032:15	6251:20	interrupt	6097:15
6313:23	6092:9	interest	6307:15	6269:22
6314:18	6097:9	6062:25	interruptibl	involved
6316:21	6135:25	6091:3,11	e 6157:1	6089:25
informed	6224:15	6133:22	intersect	6139:12
6045:22	6309:17	6135:13	6220:24	6268:12
6102:25	6310:6,7	6137:22	6221:8	6272:11
infrastructu	6311:4	6193:20	intertie	6282:11
res 6143:9	6312:11	6269:11	6254:17	involvement
inherently	instructive	6271:24	Intervenor	6268:14
6028:3	6086:3	6274:14	6145:19	involving
initial	instruments	6276:18	Intervenors	6127:12
6042:22	6075:18	6279:4,7	6029:24	Iowa 6237:18
6049:6,16	intact	6280:17	6113:7	IPP 6170:18
6058:9	6144:7	6281:4,7	6215:9	6176:4
6101:14	integral	interested	interviewed	IR
6105:18	6138:10	6094:6	6146:21	6017:3,4,5
6116:7	integrated	6133:23	introduce	,6,7,8,9,1
6126:25	6020:8	6059:1	6307:15	0,11,12,13
6255:7	6065:1	interests	introduced	,14
initially	6169:6	6137:13	6118:16	6018:23,25
6025:14	integration	interface	6151:23	6019:1,3,5
6130:10	6260:13	6156:17	introduction	,7,9,11,13
6197:23	intended	6254:12	6052:13,14	,15,17,19
initiates	6074:10	6255:19	6297:15	6084:24
6259:23	6219:22	6257:3,19	introductory	6098:1,12
initiatives	6222:6	6258:10,21	6049:4	6126:16
6145:13	intending	interim	intuitively	6227:20
innocuous	6210:4	6293:16	6039:6	6236:5
6139:17	intent	interior		6247:23
input		6236:20		6254:23
6030:16				6255:2,6,7

6262:24	6077:7	6085:5,7	6188:10	6276:14
IRP	6082:15	6086:4,7	6189:1	6277:6,8
6300:5,16	6093:5	6091:6	6191:4,24	6280:7,8,1
IRR 6267:12	6094:18	6094:12	6192:4,5,1	3 6281:1
6268:9	6107:10,11	6099:1,24	3 6193:11	6283:17,20
6269:5	,25	6100:7,9,1	6195:1	6285:13
irregulariti	6108:18	5 6102:21	6196:5,7,1	6287:9
es 6137:5	6112:18	6106:3	6	6289:1,21
irrelevant	6116:17	6108:6	6198:11,14	6291:7
6140:15	6134:6	6109:8,9,1	,21,23,25	6292:17,19
6271:18	6140:10	2,25	6200:3,24	,23
IRRs 6096:24	6250:18	6110:17	6202:12	6293:12,17
IRs 6018:11	item 6079:1	6112:3,11,	6203:1,9	,18,19
6097:25	6081:2	13,22	6204:16,23	6296:3,4,1
6257:21	6300:7	6114:7,10	6205:2,6,7	4 6297:7
isn't	items 6083:2	6118:14	,9,14	6300:4
6045:25	it'll 6214:8	6124:17	6207:24	6302:16
6059:14	it's	6130:7,14,	6208:1	6303:24
6082:11	6022:3,21	16,22	6214:11	6304:1
6084:21	6024:21	6131:23	6216:2,9,1	6306:8
6109:8	6026:25	6132:5,21	8	6307:11
6119:12	6027:8	6135:21	6218:10,25	6308:18,24
6120:5,10,	6028:19	6136:6	6219:5	6309:1,5
25 6164:25	6029:3	6138:3	6220:7,11	6313:22
6197:22	6030:7	6139:3,16	6224:12,23	6314:7
6209:10	6031:8	6140:18,23	6225:15	6315:24
isolate	6032:3,7,2	6141:18	6227:20	6318:1,17
6082:17	4 6036:12	6142:12,20	6228:13	6319:3
isolation	6037:17,21	,24	6229:21	IV 6057:10
6302:21	,22 6039:5	6144:4,11	6230:3,22	I've
issue 6052:2	6041:1	6147:6	6234:19,20	6042:2,4
6054:22	6043:21,22	6149:12	6237:4,6	6050:13
6101:11,12	6045:6	6150:20	6238:10	6073:22,23
6102:6	6047:23	6152:13,21	6239:13,16	6079:7
6106:15	6048:7	6153:21	6240:4	6101:10
6138:21	6049:19	6155:17	6242:17	6112:24
6139:1	6051:9	6157:12,13	6243:1,2,4	6114:6
6164:18	6054:23	6160:22	6244:9,10,	6120:23
6177:22	6058:9	6162:3,9	15,16,18	6132:3
6211:7,22	6059:1,9	6163:10,19	6245:17,18	6133:24
6250:22,25	6060:11	,20,25	,19	6144:3
6259:4	6063:6	6167:8,12	6246:4,20	6147:1
6261:6	6064:15	6169:7,11	6249:19	6163:8
6262:6	6068:12	6171:1	6252:13,16	6165:12
6290:17	6070:18	6172:4,5	6263:5	6166:24
6318:6	6074:12	6174:17,20	6264:14	6175:4
issues	6075:23	6175:5,6	6265:13,16	6199:21
6039:20	6076:16	6179:24	,19,22	6201:6
6053:24	6078:25	6180:2,3,7	6266:19	6202:3
	6080:10	6181:4,12,	6269:21	6222:10,11
	6081:2	13	6270:6,14	6245:3
	6084:15	6182:7,24	6271:2,4,5	6249:10
		6184:7,21	,8,9,14	6262:24
		6186:7,14	6272:16	

6266:16	Jessica	6066:13,16	6279:2,14,	jurisdiction
6300:2	6015:21	6067:22	20,24	s 6131:3
6314:8	6016:12	6073:5	6280:6,15,	6300:3
	6117:20,21	6075:6	19,24	
<hr/> J <hr/>	,24,25	6076:22	6281:9,11,	<hr/> K <hr/>
Jack 6143:23	6118:10,19	6078:22	14,23	K19 6026:25
Jacobson	6119:2,5,1	6079:20,24	6282:1,23	6085:11
6260:4,10	0,18	6080:6,13	6283:10	Kansas
Jacobson's	6120:4,10,	6081:8,23	6284:16,22	6237:19
6260:18	20,25	6082:4	6285:5,10,	Kapitany
Jaffrey	6121:13	6084:8,16	14,16,24	6014:14
6264:15	6122:13,17	6086:7,23	6286:6,10,	6148:19,25
James	6123:15,19	6095:10,25	13,23	6149:16
6137:17	6124:18	6097:11	6287:4,11,	6154:24
January	6125:8,16	6098:5	17	6157:17
6069:11	6126:15,22	6100:14,19	6288:1,14,	6158:13
6109:2	6127:15	6101:13	23	6159:20
Jeffery	6128:13,17	6102:7,10,	6289:11,15	Keeyask
6264:15	,23	19 6103:23	6290:8,12	6022:3,17
Jennifer	6129:3,25	6104:3,11,	6291:3,16,	6025:13
6015:9	6130:5,25	18,22	22 6293:11	6026:15
6016:21	6131:21	6114:1,24	6294:7,12,	6027:14
6249:12,16	job 6074:14	6115:18	16,21	6028:3
6250:3,6,7	6310:10	6116:1,21	6295:1,22	6043:19
,11,17	jobs	6117:10	6296:14,21	6051:24
6251:8,17,	6146:11,16	6151:17	6297:12,21	6052:22
24	John	6206:24	6298:2,5,1	6054:2,8,2
6252:2,7,1	6016:7,18	6248:23	2,17,22	4 6055:4
8,25	6019:23	6264:17,24	6299:2,18,	6056:11
6253:6,12,	6030:13,19	6265:7,12,	21 6300:1	6059:19
23	,25 6031:7	18,23	6301:23	6078:6
6254:3,25	6032:12	6266:7	6302:2,6,1	6106:24
6255:2,7,1	6033:7,19	6267:5,16,	0,19	6131:12
4,17,23	6034:6,13,	20,24	6303:7,16	6216:6
6256:2,10,	19,22	6268:5	6304:9,16	6254:10
19,21	6035:16,25	6269:24	6305:12,24	6313:2,25
6257:1,8,1	6036:6,23	6270:4,11,	6306:6,17	6314:22,23
5,17,18	6037:7,13,	16,24	6308:9,20	,24
6258:5,14,	17 6038:11	6271:8,12,	6309:10,19	6315:18
19	6039:4,9	22	6310:9,23	Keeyask/Gas
6259:2,4,1	6040:8,19	6272:1,21,	6311:23	6021:22
2,19	6041:4	25	6312:15,20	Keeyask19
6260:2,18	6044:22,25	6273:6,20,	Joseph	6026:25
6261:5,13	6047:14	24	6135:6	key 6094:18
6262:5,9	6050:5,10,	6274:6,11,	judgment	6205:23
6263:2,8,1	25 6052:12	15,21,25	6031:5	6248:5
2	6053:24	6275:7,13,	6066:23	6282:3
Jersey	6055:17	21,25	6108:7,15	6283:22
6213:11	6058:19	6276:8,12,	jumped	kilowatt
	6060:20	23	6222:10	6230:6
	6062:1	6277:2,9,2	jumping	
	6064:10,25	4	6202:13	
		6278:7,11,		
		18		

6231:6,8	KURT	6100:11,16	6207:9	6014:15
6232:6	6018:18,21	6101:3	labelled	las 6086:2
6233:1,9	6132:13	6102:4	6069:8	last 6021:1
6235:6	kV 6087:22	6103:24	6070:12	6022:7
6236:7,24	6088:15	6104:8,15	6071:2	6042:5,20
6238:8,9	6089:6	6105:11	6085:11,13	6043:1
6239:11	6251:25	6106:1	6237:6	6058:8
kilowatts		6110:9	6244:14,22	6067:21
6239:6	<hr/>	6112:8	labelling	6070:16
kinds	L	6113:1	6182:20	6071:2
6023:16	La 6016:5,16	6115:2	lack 6195:10	6099:12
6062:16	6017:3,4,5	6121:15,16	laid 6062:4	6103:13,14
6063:4	,6,7,8,9,1	6125:17	6309:6	6105:8
6093:5	0,11,12,13	6126:1,16,	Lake 6135:23	6107:23
6114:15	,14	17,19,23	land 6135:4	6115:3
knew	6018:11,23	6127:4	6136:16	6116:9
6088:5,13	,25	6151:15	6137:6,13	6118:8
6089:5	6019:1,3,5	6161:24	6140:20	6125:9,25
6268:23	,7,9,11,13	6168:22	6144:5,9	6126:24
6269:1	,15,17,19,	6177:18,21	lands	6138:3
6280:20	21 6020:22	,22	6135:13	6143:20,25
Knight	6021:1,4,1	6186:6,8,1	6137:14,22	6144:6,7,9
6044:9	2 6027:18	4,18	language	,12
6045:15	6028:23	6190:18	6098:16	6146:17
6046:12,22	6030:12,17	6191:13	6231:20	6148:4
,25	,24	6195:8	large 6067:5	6172:9,15,
6047:3,7	6031:1,3,5	6207:2	6130:11	23 6173:5
6049:23	,11	6208:2	6131:5,11	6219:18
6055:14	6033:11	6216:4,6	6150:22	6242:16
6056:5	6038:2,8	6217:18,25	6165:19	6275:18
6058:7,13	6042:21	6219:1	6212:23	6277:4,14
6060:4	6045:25	6221:14	6251:12	6280:17,22
6066:22	6046:6	6227:19,21	largely	6281:8
6318:18	6049:2,6,9	,22	6165:19	6292:19
knowledge	,15	6229:23	larger	lasted
6048:17	6050:14	6230:4,19	6058:18	6083:4,7
6060:12	6052:1	6235:4	6059:2	late 6133:25
6087:13	6057:16	6236:6,7,1	6089:19	6143:24
known	6064:18	0 6241:24	6156:23	later
6037:18	6066:24	6242:3,20,	6157:1	6027:7,16
6048:14,17	6068:8,11	21 6243:8	6180:7	6033:4
6135:22	6084:3	6247:11	6297:9	6052:4
6203:1	6086:18	6250:9,19	large-scale	6118:15
Kulchyski	6087:12,18	6264:10	6127:21	6132:22
6016:14	6088:5,13	6266:1,19,	largest	6215:15
6133:9,11,	6089:14	20 6267:3	6236:21	6296:6
16,17	6091:7	6282:11	Larry	latest
6134:22	6092:1,20	6283:1		6020:19
6145:10,18	6094:13	6284:8		6062:14
6147:14	6095:3,20	lab 6244:14		latter
	6097:7	label		6049:20
	6098:1,2,1	6206:25		
	0			
	6099:15,19			

6255:14	learned	6258:7	6232:1	light
Lavigne	6028:9	legislation	level	6033:12
6320:7	6042:5	6300:5,15	6069:16,19	lights
lawyer	6072:10	lengthy	6070:3,7,10,19	6161:10
6249:21	6077:9	6306:18	6071:8,14	likelihood
LCA 6017:20	6078:10	lens 6288:9	6087:10	6029:10
6071:3	6099:25	less 6045:22	6118:24	likely
6132:5	6202:3	6093:2	6130:16	6039:2
6150:3,9	6301:6	6112:3	6134:13,18	6041:11
6208:5	learning	6181:1	6158:1,10	6101:16,20
6254:18,19	6048:23	6182:7	6206:4	6102:25
6270:1,6	6076:1	6206:3	6207:7	6119:12
6276:5	learnings	6225:21	6281:2	6124:2
6278:8	6075:16	6234:21	6294:25	6126:9
6281:19	leash	6254:15	6295:19,23,24	6159:6
6283:5,7	6159:16	6273:17,22	6296:17	6212:18
6284:25	least	6293:6	6302:1,4,5,8,13,17,18	6213:2
6285:3,9	6025:14	6302:23	6304:25	6239:23
6286:16	6029:10	6315:21	6305:9	likewise
6289:6	6037:3	lessen		6069:20
6294:19	6042:14	6125:13	levelized	limb 6159:13
6295:20	6068:1	lesson	6232:8,17	lime 6258:15
6296:13	6072:20	6099:25	liabilities	limit 6154:6
6312:24	6112:9	lessons	6134:7,23	6156:16
6313:16,17	6118:6,12	6042:5	6135:11	6186:25
LCA-16A	6125:23	6077:17	6138:24,25	6219:11,17
6306:9	6126:10	6128:2	6139:22	limitation
LCA-48	6156:20	let's	6140:2,6	6074:19
6017:15	6157:5	6021:20,25	6272:10	6077:13
6132:11,16	leave	6022:1	liability	6155:14
LCA's	6048:25	6034:24	6138:19	6159:21
6116:12	6146:12	6038:19,22	6290:18,22	6164:21
6280:13	6249:22	6040:4	liberal	6193:18
6282:5	6308:2	6074:14	6139:10	limitations
lead 6021:17	leaving	6076:23	liberty	6153:17
6043:22	6316:12	6082:7,8	6287:2	6155:11
6100:4	led 6140:18	6083:9	licence	6159:19
6131:13	left-hand	6091:2	6110:18	6193:25
leaders	6036:15	6132:20	lie 6043:7	6195:11,12,19
6142:18	6201:16	6145:2	life 6097:4	6218:19
leading	6237:22	6167:1	6144:6	6248:5,7
6081:6	6240:22	6184:3	6157:20	limited
learn	legal	6214:13	6234:12	6110:7
6028:13,15	6135:16	6222:5	6270:22	6162:24
6044:1	legend	6293:12,13	6272:3,6	6300:21
6073:1	6068:25	6303:17	lifetime	limiting
6088:16	6069:5	6318:3,13	6234:12	6164:23
6099:25	6070:5,9	letter		6186:21
6128:2	6257:24	6194:10		

6194:13,19	6178:17	6276:16	6175:11	lock 6076:6
limits	6205:9,17	link 6121:5	6177:24	logic
6106:21	6207:18,20	6144:9	6179:22	6055:20
6153:6	6208:12,20	linking	6182:22	logical
6154:6,9	,23	6120:16	6184:9	6101:21
6156:3,23	6209:2,8,1	lip 6291:23	6185:19	long 6099:25
6157:3	7,18	list 6016:3	6187:15	6160:3
6160:16	6211:7,23	6017:1	6197:25	6199:19
6227:4	6217:23	6283:22	6198:11	6202:22
6297:10	6219:18	listed	6199:1,5,9	6213:3
line	6220:1,7,1	6069:6	,11,25	6276:10
6021:8,9	0,14,18	literally	6205:7,15,	6316:8
6022:16	6221:4,17,	6077:23	19 6207:8	6317:15
6023:9,19	22	6249:4	6210:13,19	longer
6024:14,20	6223:11,18	little	6211:8,23	6083:5,8
6025:15,21	,19	6021:6	6212:24	6092:5
,23 6026:3	6224:4,12,	6043:2	6220:2,8,1	6125:13
6027:1,14	13	6049:10	1,24	6263:2
6040:10	6225:11,16	6063:22	6221:4,12	6296:5
6068:17	,22 6226:5	6064:5	6224:8	6319:8
6071:16	6228:4	6065:3	6276:20	long-term
6077:24	6244:14,16	6068:9	6294:14,19	6025:7,8
6078:1,6	,21	6072:17	,20,22,24	6084:6
6080:17	6246:7,22	6086:17	6295:23	6112:17
6081:10	6251:25	6091:2	6296:13,23	6153:25
6083:25	6253:25	6134:1	6303:20,21	6155:10
6084:11	6284:14,15	6157:9	,22,24	6159:3
6086:16	6285:2	6158:18	6304:7,10,	6273:17,18
6087:14,20	6286:20	6215:7,13	12	6309:8
,22	6294:19	6238:5	6305:1,20	loss 6203:17
6088:14,15	6296:13,17	6249:23	6308:7	6262:2
6089:2,6,1	6297:20	6261:15	loading	lot 6025:22
5,19,20	6298:4,7	6294:9	6156:22	6049:1,14
6090:8	6299:1	6316:3	loads	6056:16
6091:13	6303:4,5,8	live 6144:23	6120:14	6059:9
6092:18	,11,12	living	6121:3	6065:18
6093:11,21	6304:14	6144:5	6256:6,15	6075:25
,23	6305:2,3,1	load 6022:25	6295:25	6083:5
6099:2,5,6	0,11,14	6025:18	6303:18	6104:23
6103:13	6306:4,12	6070:24	6305:18	6106:11
6109:25	lines	6125:22	6307:4	6111:9
6118:4,11,	6023:24	6130:19	local	6112:2,3
16	6079:2	6152:12	6129:20	6114:22,24
6121:21,25	6143:20,25	6163:4	6141:12	6138:3
6122:18,21	6144:11	6164:21	6144:16	6140:23
,22	6156:12,23	6166:5	6146:6	6144:3
6123:1,8	,24 6157:5	6167:13	located	6279:8
6129:10,21	6176:1	6169:11	6129:6	6292:17
6143:22,23	6217:16	6171:5,17	6238:18	6295:10
,24	6220:24		Location	6299:9
6154:14	6221:8		6240:5	6301:6
6156:1	6256:9			
6170:1	6262:10			

6309:20	6053:14	6241:9	6090:6,14,	6173:20
6314:8	lowers	makers	19	6174:4,22
lots 6065:14	6036:4	6106:12,14	6091:8,10	6179:22
Louisiana	lowest	6273:16	6092:3,19	6180:8,10,
6213:24	6096:6	manage	6104:13,16	16,21,25
low 6026:17	6162:14	6022:14	6105:18	6181:9
6030:21	6236:22	6029:14	6110:3	6182:14,19
6031:4	6281:1	6153:15	6113:6	6183:12
6039:8	6292:14	manageable	6114:3	6184:15,22
6040:17	low-flow	6128:6	6116:15,18	6185:9,14,
6041:19,23	6243:24	managed	6117:22	19 6186:20
6042:8,15	6309:25	6144:16	6118:6,12,	6187:14
6043:18	lows 6042:7	management	20	6189:16
6044:3	6044:3	6107:4	6119:2,11,	6190:6,7
6045:4	6046:8	6130:19	16,20	6191:11
6046:8	6057:22	manages	6120:11,14	6193:13
6052:16	6058:2,3	6087:3	,16	6194:11,16
6053:12,14	lucrative	mandate	6121:1,4,6	6195:17
6055:8	6023:5	6158:23	,21,22,24	6196:2
6056:12,20	6210:6	Mani 6262:12	6122:22,23	6197:1,18
,21,22	lunch	Manitoba	,25	6198:10
6061:25	6131:24	6014:3,7,9	6124:5,9	6199:1,20
6063:7,21	6132:20	,23 6015:5	6126:5,16,	6202:6
6064:2,6	luxury	6017:19	18 6127:3	6203:19
6081:17	6065:25	6020:3,20	6129:6,15	6204:3,11
6083:4	<hr/>	6021:24	6130:6	6205:10,18
6104:12	<hr/>	6023:21,22	6131:19	,19 6206:3
6105:3	macro	6025:15	6135:19,22	6207:1,21,
6124:14	6134:13	6030:9	6145:12	24 6208:4
6276:6	magic 6287:5	6031:11,20	6148:8,10,	6212:9,18
6277:21	magnitude	6033:12	11,12,15	6213:1,3,1
6278:2,9	6131:16	6034:2	6149:19	8 6214:6
6279:4,7,1	mail 6272:14	6035:14,23	6150:1,4,7	6215:6
2	main 6061:10	6037:20	6151:25	6216:13,25
6309:17,25	6094:19	6039:14	6152:8,12	6217:10
6310:6,7	6109:4,5	6043:2	6154:1,13	6220:2
6311:1,5	maintain	6047:24	6155:21	6221:4
lower	6053:12	6053:5,25	6156:17	6222:7
6039:17	maintains	6063:9,13	6158:18	6227:3,22
6060:11	6202:6	6069:9	6159:21	6229:24
6063:22	major	6070:14	6160:23	6230:5,15
6120:6	6135:16	6071:13	6161:2,10,	6231:4,5,2
6170:17	6208:6	6073:10	16,18	5 6232:2
6176:4	6213:3	6076:19	6163:3	6235:22
6205:7,15	6233:25	6079:15	6164:18,19	6236:5
6234:12	6235:16,24	6080:15	,21	6239:12,16
6298:7	majority	6085:17	6165:4,7,1	6240:1
6299:22,23		6086:13,21	7	6241:24
lowered		6088:16,22	6166:9,19,	6242:6,11
6302:21		6089:18	22	6244:5
lowering			6167:3,12	6247:21,25
			6168:14,17	6248:6,14
			6169:18	6249:21
			6171:3	6252:10

6253:2,25	map 6165:13	6268:8,15,	6301:17,18	6027:4
6254:13,16	6237:8	20	,24	6042:2
6255:2,8	6240:4	6269:4,10,	6302:3,7,1	6044:18
6256:18	6249:24	15,19,25	5	6079:6,10
6257:9,19	March	6270:5,12,	6303:2,14	6080:4
6260:20,25	6020:20	18	6304:6,11	6089:12
6261:8,21	6266:4	6271:6,9,1	6305:7,21	6102:14
6262:6,11,	Marilyn	9,23	6306:1,8	6247:22
14	6014:14	6272:18,22	6307:22	math 6031:23
6264:10,13	6148:19,25	6273:3,10,	6308:1,2,1	6200:23,25
,22	6149:16	14,21,25	0	6201:10
6265:1,2	6154:24	6274:7,12,	6309:1,16	6202:4,23
6275:23	6157:17	16,22	6310:4,18	6317:8
6276:5,15,	6158:13	6275:4,9,1	6311:16	mathematical
16 6277:20	Maritimes	7,22	6312:8,17,	6031:8
6278:1	6193:20	6276:2,9,1	23	matrix
6279:8,22	marked	3,24	6313:5,8,1	6216:7,8
6285:1	6018:11,13	6277:6,20	5,22	matter
6286:10	6029:20	6278:1,8,1	6314:5,9,1	6134:3
6287:2	6068:12	2,24	3,15,19	6292:17
6288:17,20	6097:25	6279:10,18	6315:7,12,	6300:4
,24	6217:23	,21	17,23	matters
6290:25	6243:2,8	6280:4,12,	6316:1,9	6151:7
6291:14,25	market	16,20	6317:17	maximum
6292:2	6022:11,20	6281:6,10,	maroon	6169:14
6294:4,18	,24	12,19,24	6220:13,18	6172:5,6
6295:15	6032:14,16	6282:2,13,	MARY	may 6048:13
6296:1	6162:20	20,21	6016:8,19	6055:23
6297:16	6172:7	6283:3,17,	6019:24	6073:14
6299:6	6176:5	20	6151:18	6089:8
6301:20	6178:20	6284:3,6,7	6224:10,23	6091:4
6306:9,19	6179:2,3	,17,23	Maryland	6102:15
6308:7,11	6183:8,16	6285:6,11,	6213:11	6129:21
6309:2	6187:1	15,18,25	Mason	6135:15
6313:16,18	6210:2	6286:9,11,	6143:23	6145:23
,24	6213:14	14	Massachusetts	6156:13,23
6314:21	6236:9	6287:1,5,1	s 6281:20	,24 6157:4
6315:8	markets	2,18	6283:1,20	6160:9
Manitobans	6028:13	6288:10,19	mat 6249:22	6162:16
6142:7	6178:22	6289:5,14,	material	6170:19
6143:7	6213:9	23	6057:25	6175:25
6158:21	Marla 6015:6	6290:9,24	6058:1	6176:5
Manitoba-to-	6016:22	6291:13	6073:3	6178:10
US	6264:3,7,8	6293:9	6107:13,20	6205:3
6258:2,9,2	,9,21,25	6294:3,8,1	6108:3,7	6224:10
1	6265:9,16,	3,17,23	6143:8	6234:2
manner	21,25	6295:17	6319:12	6264:8
6189:15	6266:8,11,	6296:7,16,	materially	6318:2
6265:24	16	24	6034:21	6319:11
6291:12	6267:3,10,	6297:17,22	materials	maybe 6052:4
Manuel	17,21,25	6298:3,9,1		
6134:24		3,18,24		
		6299:13,20		
		,23		

6059:1	6072:16,21	megawatts	6267:4	MH-167-2
6081:16	means 6055:2	6073:12	methodology	6017:22
6096:9,10	6136:12	6187:16	6275:5	6150:15
6098:13	6168:3	6188:17,18	methods	MH-167-3
6156:13,25	6170:15	,22	6111:23	6017:23
6191:3	6171:10,15	6189:11,18	Metis	6151:1
6192:10	6176:2	6210:18	6117:22	M-hm 6129:25
6211:25	6189:15	6212:10,17	6140:20	mic 6151:9
6218:3	6202:14	,25 6219:2	Metres	6248:20
6230:3	6218:13	6240:17,19	6237:9	6284:3
6248:23	6244:18	6254:15,19	metric	Michael
6252:16	6249:17	6258:24	6033:11,17	6015:19,25
6291:22	6314:5	6262:15	,18,20,21	microphone
6299:3,4	meant	member	6037:1	6018:7
6300:12	6023:18	6014:14,15	6061:21	6113:6
6301:10	measure	,16,17	6094:14	6264:1
mea 6044:11	6044:11	6133:19	6095:6	middle
mean 6022:3	6265:10	members	6096:7,8	6051:11,12
6024:6,8	measures	6068:15	6097:9	6105:1
6028:1	6078:19	6073:10	6265:4,13,	6123:21
6039:5	6086:20	6103:7	14,17	6126:2
6055:1	meat 6134:3	6112:25	6270:17	6198:14,23
6060:2,15	mechanics	6113:1,16	6280:9	6236:17,18
6072:2	6086:8	6116:23	metrics	Miles
6073:22	meet 6075:21	6250:9	6033:22	6232:12
6074:25	6120:13	memo 6306:23	6043:6	mill 6035:13
6076:7,16	6121:3	memorized	6045:9	Miller
6080:24	6152:12	6252:4	6046:7	6015:14
6084:16,17	6172:7	memory	6065:7	million
6088:18	6225:17	6080:2	6095:4,11,	6034:18
6093:16	6259:25	6149:5,11	14,17,21	6035:14,19
6096:12	meeting	6314:14,17	6096:20	6039:14,17
6116:19	6167:22	mention	6097:1	6043:22
6124:12	6189:24	6023:9	6114:8,14	6136:19
6129:7	meetings	6067:23	6265:20	6144:15
6135:6	6247:24	6253:12	6269:6	6292:18
6138:5	mega 6145:6	mentioned	Mexico	6301:25
6196:12,21	megawatt	6055:22	6213:24	6302:4
6205:2	6087:22	6075:15	6237:19	6303:8,13
6206:10	6088:15	6290:22	MH 6030:5	6314:25
6207:2	6089:19,20	merchant	MH-104-10	6315:9,20
6217:25	6092:18	6024:1	6017:17	millions
6224:12	6093:11	6269:9	6149:24	6136:21,22
6234:19	6118:3	6290:18	MH-166	6137:7
6235:15	6121:21	message	6017:16	6138:24
6267:3	6122:22	6283:7	6148:17	6140:7
6268:5	6205:9,17	met 6151:6	MH-167-1	mind 6024:25
6299:3,25	6207:18	method	6017:19	6092:2
meaning	6255:18	6257:4	6150:7	
6116:16				
6257:3				
meaningful				

6133:11	6132:20	6019:9	6213:24	6247:12
6215:16	6134:4	MIPUG-22-8	Missouri	6248:15
6296:15	6148:4	6017:10	6237:19	models
6302:20	6214:14	6019:11	mistaken	6037:15
6314:10	6316:10,25	MIPUG-22-9	6195:21,22	6070:15
mind-set	6317:3,10,	6017:11	6244:23	moderate
6209:16	20	6019:13	mitigate	6125:21
minimali	MIPUG	misery	6295:5	modern
6096:15	6015:16	6142:6,24,	mitigation	6136:16,19
minimis	6017:3,4,5	25	6145:14	6137:6,16
6063:6	,6,7,8,9,1	mislead	mix 6069:24	6195:15
minimizing	0,11,12,13	6307:13	6070:1	modified
6096:15	,14	mismatches	6072:11	6188:11
minimum	6018:11,12	6233:15	6256:14	6310:20
6028:24	,13,17,23,	MISO 6022:21	mixes 6256:6	modular
6029:4	25	6119:5,13,	mixture	6126:7
6160:24	6019:1,3,5	19	6070:17	6141:23
6161:17	,7,9,11,13	6120:6,13	6077:18	module
6165:21	,15,17,19	6121:22,23	MKO 6015:18	6128:3
6197:2,8,1	6098:1	6122:23,24	MMF 6015:21	6259:21,22
9 6198:3	MIPUG-22-1	6128:20,25	6213:7	moment
6215:11	6017:3	6162:4	mobile	6182:12
Minnesota	6018:23	6214:8,9	6141:22	6196:25
6027:14	MIPUG-22-10	6249:24	mode 6024:20	6249:1
6088:3	6017:12	6250:24	model	moments
6203:11	6019:15	6251:1,3	6069:9,10	6171:2
6208:12,20	MIPUG-22-11	6253:13	6079:15	Monday
,23	6017:13	6254:6,13,	6081:6	6268:21
6209:2,8	6019:17	20 6255:10	6085:9	6289:5,25
6211:21	MIPUG-22-12	6256:12,16	6093:20,21	6294:6
6237:17	6017:14	,18	6110:2,17,	Monday's
6252:11	6019:19	6257:19	22	6206:1
6253:3	MIPUG-22-2	6259:9,13,	6111:5,10	6208:11
6260:14	6017:4	16 6260:10	6112:4,10,	money 6028:6
Minnesota's	6018:25	6261:17	14	6029:4
6211:6	MIPUG-22-3	6262:7,12,	6310:20,25	6104:1,6,2
minus	6017:5	14	modelled	4 6270:25
6035:21	6019:1	MISO's	6033:1	Monnin
6036:15	MIPUG-22-4	6255:4	6063:8,13	6015:24
6062:18	6017:6	6259:5,21	6080:17	6038:5
6244:22	6019:3	6262:20	6085:17	6041:12
minute	MIPUG-22-5	miss 6247:7	6097:21	6082:14,23
6147:18	6017:7	missed	modelling	6098:11,15
6249:4	6019:5	6171:13	6032:17,23	6106:13
6255:21	MIPUG-22-6	6222:11	6037:19	6107:12
6263:18	6017:8	missing	6044:14	6131:25
6297:2	6019:7	6166:17	6058:20	6132:1,14,
minutes	MIPUG-22-7	Mississippi	6108:23	19 6189:23
6083:10	6017:9			

6190:10,20	4,17,23	6067:16	6047:5	necessarily
6191:2,17,23	6256:2,10,19,21	6219:21	6080:22	6027:8
6192:6,12	6257:1,8,1	6312:21	6081:21	6077:25
6257:14	5,17,18	moves	6105:19	6079:8
6262:22	6258:5,14,19	6224:17	narrowing	6114:9
6268:10	6259:2,4,1	6303:11,12	6164:8	6119:23
6282:9,16	2,19	moving	narrowly	6129:20
6307:14	6260:2,18	6057:11	6047:17	6156:12
6316:23	6261:5,13	6070:8	Nation	6209:3
Montana	6262:5,9	6124:19	6138:11	6277:3,14
6237:18	6263:2,8,1	6127:15	Nations	6280:7
months	0,12	6130:7	6135:2	6283:1
6042:6	M-O-R-O-Z	6186:5	6141:22,24	6291:9
6044:2	6249:16	6215:1	6145:1	6298:7
6045:11	Morrison	6224:12	native	necessary
6047:20	6064:9,10	MPA 6062:22	6211:8,23	6038:8
6188:22	6067:1	6063:15	natural	6152:21
6189:11	6091:17	6064:9	6070:23	6163:10
6203:12	6100:13	6278:21	6106:5	6208:1
6277:5	6101:6,9,1	6280:25	6107:4	6277:17
6280:18,22	1,16	MPV 6314:25	6136:7	negative
6281:3,7,8	6102:2	mu 6066:24	naturally	6059:2
moreover	mostly	multiple	6114:16	6084:14
6115:6	6074:11	6093:23	6296:3	6092:18,21
morning	6145:23	6148:14	nature	6146:19
6083:3	MOU	6247:24	6065:11	6267:22
6113:13	6212:9,14	6259:15	6139:13	6285:20
6213:7	move 6021:14	multi-value	6190:23	6287:13
6295:18	6055:4	6259:5,9,1	6229:3	negotiate
6316:5,12,14,19	6056:19	3 6260:12	6250:12	6027:20
6317:24	6057:14	Murphy	6258:23	negotiated
6318:19	6121:13	6317:15,18	6295:20	6139:4
6319:3,17	6156:25	myself	Navigant	6140:21
Moroz 6015:9	6157:6	6072:15	6265:2	negotiation
6016:21	6192:11	6146:4	Neal	6094:3
6151:6	6196:25		6016:8,19	neighbouring
6152:1	6204:8		6019:24	6124:16
6248:25	6218:12		6113:14	6239:16
6249:12,16,18,19,20	6232:24	N/A 6217:24	6151:18,22	neighbours
6250:3,6,7,11,17	6236:4	6218:13	6224:10,23	6195:17
6251:8,17,24	6238:14	naked	nearby	6212:8,22
6252:2,7,1	6284:8	6150:23	6146:18	Neither
8,25	6294:4	namely	Nebraska	6314:15
6253:6,12,23	6303:5	6053:15	6237:18	net 6039:11
6254:3,25	6304:14	6117:1	nece 6277:13	6046:20
6255:2,7,1	6305:9,10	Nancy	necess	6103:25
	6308:21	6146:23	6209:3	6167:5
	6312:21	narrow		6180:5
	moved			6205:7,15
				6220:2,8

6244:23	6103:21	6088:13	notion	6045:7,14
6265:4,8,1	6104:9,21	6089:1,6,1	6135:9	6114:19
0 6267:4	6282:6	5 6113:15	notional	6292:3
6293:17,18	6283:24	6135:18	6093:7	obtain
,19,22	none 6077:3	6137:17	November	6120:11
6294:20	6204:2	6139:3,4,1	6191:24	6121:1
6313:10	6282:10	5,23	6192:2	6172:7
network	non-	6140:3,4	6255:4,10	obviously
6024:5,10,	engineerin	6142:9	6257:20	6022:16,21
17	g 6171:1	6144:4	6306:24	6028:1
NFAT	non-firm	northwest	now-standard	6047:4
6051:17,23	6170:12,18	6136:15	6139:8	6054:12
6068:22	,20 6172:4	6137:1	np	6055:1
6089:11	6176:4	6187:3,8,1	6015:7,8,1	6069:4
6207:6	6178:19,25	5,21	4,19,22	6087:3,17
6247:22	6179:2	6189:16	NPV 6039:16	6108:10
6288:18	6186:25	6191:12	6042:20	6112:3
6289:16	non-firm/	6192:18	6043:24	6129:18
6292:3,8,1	market	6193:24	6096:3	occur
1	6182:16	notation	6268:4	6090:16
6306:5,13	non-hydro	6218:13	6269:16	6129:16
nice 6074:14	6107:2	note 6058:22	6270:16	6203:17
6256:12	non-Hydro-	6068:2	6271:13	6204:2
6300:25	affected	6099:2	6273:21	6267:22
night	6142:25	6113:17	6291:14	6277:1
6292:20	non-material	6125:12	6293:9,11,	occurred
nine 6180:8	6108:4	6126:3	14 6297:25	6083:23
6201:1,5,1	noon 6317:13	6139:3	number's	6277:8
7 6280:18	Nope 6281:9	6215:8	6186:13	6280:21,22
6285:20	normal	noted 6098:2	6109:25	o'clock
6319:17	6199:2	6127:4	6147:10	6132:22
nine-six	6201:7,8,1	6216:3	6057:10	6316:13
6294:1	5,20	notes	Nunavut	6319:17
nineteen	6203:7	6035:11	6136:16	ODETTE
6287:14	normally	6083:1	6137:19	6109:19
ninety	6065:6	6212:3	nutshell	offer
6034:17	6259:23	nothing	6259:12	6044:18
ninety-nine	North	6069:25	<hr/>	6045:13,14
6244:6,10	6210:8,13,	6176:8	obligated	6049:16
ninety-two	25	6215:12,13	6262:14	6060:10,13
6236:10	6211:4,13,	6290:20	obligations	offered
nobody	15,20	6319:7	6164:22	6049:15
6042:10	6237:17	notice	6183:16	6088:1
nobody's	6239:25	6132:23	6262:13	offering
6042:11	6240:18	noticed	observation	6142:11
nomenclature	6253:8	6023:8	6254:6	6215:18
6253:13	Northern	6040:8	6298:6	Offhand
nominal	6087:13,20	6264:18	observations	6079:24
				offices

6306:19	6121:17	Oklahoma	6056:18	6126:11
official	6122:9,13,	6213:25	6057:16	option
6049:16	14 6123:15	6237:19	6058:7,18	6022:12
offline	6125:5,7	old	6063:20	6027:7
6191:3	6128:13	6032:6,23	6066:1	6028:12
off-peak	6130:25	6033:1	6100:16	6029:15
6123:23	6131:21	6039:12	6104:20	6059:11
6124:8,14	6147:7	6147:5	6106:2	6090:3
6153:14	6149:18	ones 6045:16	opinions	6092:5,22
6162:25	6154:10	6052:17	6046:6	6210:9
6188:17	6160:18	6054:16	6047:19	6252:9,13
6189:18	6164:5,10	6140:12	6067:9,13	6253:1,7,1
6219:6	6167:1	6256:3	6105:10	7,18,24
oh 6018:19	6169:3	6288:16	6280:1	6258:17,24
6035:6	6172:17	on-peak	opportunitie	6272:19,24
6036:11	6173:8,12,	6188:17	s 6022:24	6273:1
6040:8	14	6189:17	6023:4	6290:21
6079:5	6175:2,8,1	Ontario	opportunity	6295:21
6085:6	2 6176:22	6193:19	6025:22	optionality
6109:3	6182:3	6212:23	6049:22,23	6021:7,13,
6144:10	6184:3,24	open 6021:24	,25 6055:3	23 6022:23
6172:14	6186:5,15,	operate	6099:5	6023:14
6175:4	17 6190:10	6022:5	6120:1,2	options
6202:24	6191:2	6097:14	6121:9	6022:13
6205:13	6195:6	operates	6145:11,16	6023:16
6222:10	6198:20	6251:12	6204:11	6025:9
6230:14	6200:12	operating	6210:6	6028:4
oil 6210:13	6201:11	6023:18	6245:11	6076:12
okay 6021:25	6202:24	6310:13	6260:19,25	6126:8
6030:15	6209:5	operation	6261:4	6130:7
6031:2	6210:12	6202:23	opposed	6186:22
6033:2,10	6212:20	6309:23	6023:19	6194:14
6035:24	6213:16	6311:11	6057:18	6204:22
6036:2	6219:7	operational	6129:15	6252:8,15,
6037:8,16,	6221:11	6154:1,16	6171:5	24 6270:15
24	6223:16,17	6157:14	6232:18	oral 6027:3
6041:1,2,1	6225:3	6160:11	6244:8	orange
8 6060:20	6226:20	6170:16	6250:13	6296:16
6075:4	6227:14	6176:3	6255:20	order
6078:13	6232:7	6254:10	opposite	6153:14
6081:8,20	6236:3	operationall	6040:21	6210:18
6083:9	6238:15	y 6311:19	optimal	6228:6
6092:23	6240:20	opin 6048:14	6105:23	6229:2
6093:18	6252:2	opinion	6127:2,11	6257:4
6100:23,24	6255:1,12	6031:15	6254:16	6260:12
6104:14	6256:1	6044:12	optimistic	6277:18
6108:9	6275:9	6048:15	6234:11	organization
6109:4,21	6286:9	6049:15,17	6241:24	6113:15
6115:22	6293:12		6246:20	6135:3
6116:6	6297:17		optimized	organization
6118:19	6298:9			
	6306:1			
	6318:12			

s 6119:6 6135:12	6063:8 6076:11	overweight 6076:11	6108:21 6115:3	6236:4,10, 11,16,18
organized 6162:20	outcomes 6100:5	owner 6024:10	6116:9,10 6121:14,15 ,16	6237:2,3,4 ,5,22 6240:3,22
orienting 6257:23	outliers 6236:22	owners 6119:19	6123:20 6125:16,25 6126:23	6241:14,15 6243:1,7 6250:25
original 6032:23 6033:9 6035:1,13 6036:4 6049:2 6052:17,24 6060:23 6069:4,20 6071:7	outlined 6274:3	<hr/> P <hr/>	6152:7,19, 20,21 6157:10,16 6160:21 6163:9,20 6165:3 6166:9,16, 17,18,20 6167:22 6168:24 6169:7,13, 23,24 6173:15,24 6176:1 6177:19 6178:11,13 ,17 6179:13 6180:2,3 6182:12 6186:7,9,1 0,11,13,14 6188:2,10 6190:5,12 6191:11,13 6192:13 6193:11 6194:7,9 6196:24 6198:9,11, 15,17,18,2 1,24 6199:5,6,7 ,15,25 6200:1 6202:11,13 6216:1,9 6219:22 6222:13 6227:16,18 6228:3 6229:20,21 6230:10,11 ,15,17,18, 19,23 6231:3,14	6252:13 6254:4,5 6257:14 6259:7 6260:4 6261:9,15 6262:10 6264:25 6265:3 6266:18 6269:20 6270:6 6273:14 6274:1,2 6276:3,16 6282:3,4 6283:21 6284:12,13 6289:6,24 6294:5 6296:9,24, 25 6301:19 6302:14 6303:3,9 6304:19 6305:23 6306:2,4,1 2 6307:16 6310:22 6313:9 6314:19
originate 6023:10	output 6079:15 6085:9 6111:2,7,9 ,16,25 6245:18	p.m 6133:4 6147:20,21 6214:16,17 6263:21,22 6319:22		
originating 6253:8	outlook 6159:3	P50 6045:17		
Orle 6015:18 6016:11 6113:8,9,1 2,13,14 6114:23 6115:1,22 6116:6,22 6117:1	outlooks 6241:25	P90 6045:17		
Orle's 6117:4	out-of- system 6166:2	pacific 6187:3,7,1 5,20 6188:8 6189:16 6191:12 6192:18 6193:24		
others 6020:7 6055:6 6135:15	outputs 6037:19	packages 6239:23		
otherwise 6053:18 6210:23	outside 6058:11 6067:17 6087:7 6110:7 6246:3,4	page 6016:2 6017:2 6029:22 6033:25 6034:8 6035:2 6036:12,13 6038:3 6042:2,22 6043:1 6051:10 6056:2 6057:10 6060:24,25 6061:3 6081:3 6084:3,25 6085:6,7 6086:2 6094:17 6098:22 6099:3 6103:13 6104:7 6105:13		
ourselves 6034:24 6112:6	overall 6031:10,12 6048:12 6074:16 6175:5,7 6195:14 6313:12			
outage 6203:2,17, 25	overcame 6111:21			
outages 6203:8,10	overkill 6230:3			
outcome 6039:3,8 6057:9	Overlayed 6237:7			
	over- precision 6064:1			
	overview 6251:2			
				pages 6014:25 6079:9 6230:3,8,1 3 6242:18 6245:10
				paid 6108:14 6115:7 6272:13
				pair 6138:13
				panel 6016:5,16 6019:21

6033:23	6195:8	6103:12	6150:1,11,	18
6051:7	6198:14,23	6104:16	17	6185:1,7,1
6060:7	6236:18	6111:7	6151:3,20,	2,17
6065:5	6276:3	6166:20	21,24	6186:2,5,1
6066:20	parameter	6190:22	6152:16	0,13,16,18
6067:9,11,	6272:17	6208:21	6153:22	6187:12,20
18 6068:15	6293:24	6217:4,6	6154:10,19	,25
6083:24	parameters	6267:19	6155:8,9,1	6188:6,14,
6103:8	6032:11	6272:6	6,25	20
6108:6,18	6042:15	6288:12	6156:8,9	6189:1,8,1
6113:1	6061:8,24	6291:11	6157:8	4
6116:23	6067:3,5	6293:4,23	6158:16,17	6190:4,15,
6133:1,10	6072:7	6314:3	6159:1,5,1	24
6144:20	6083:4	particularly	1,17	6191:10,22
6147:12	paraphrase	6029:11	6160:8,9,1	6192:3,10,
6151:15	6172:23	6058:23	8	21,22
6152:20	6212:2	6062:6	6161:8,15,	6193:1,6,1
6154:12	paraphrasing	6094:21	24 6162:8	2,16
6184:19	6172:18	6115:23	6163:8,19,	6194:6
6185:8	pardon	6118:2	25	6195:6
6215:6,15	6051:3	6131:11	6164:7,11,	6196:1,7,1
6257:23	Park	6141:4	17	1,15,20,23
6264:4	6064:9,10	6146:20	6165:15,25	6197:6,17
6282:10	6067:1	parties	6166:14	6198:2,8,1
6291:25	6091:17	6132:9	6167:1,10,	8,21
6319:20	6100:13	6139:12	15,19	6199:4,18,
panels	6101:7,9,1	6207:25	6168:2,7,1	23
6021:8	1,17	6272:10	2,22	6200:10,13
6042:4	Park's	6318:1,2,2	6169:3,22	,18,24
panel's	6102:2	1	6170:24	6201:6,14,
6106:15	partially	party	6171:9,14	19
6227:10	6081:16	6133:13	6172:1,10,	6202:1,5,1
paper 6140:1	participants	passage	14,17,25	2,16,19,24
6148:4	6263:19	6138:8	6173:8,12,	6203:7,15,
paperwork	participate	6164:6	19,24	23
6215:16	6266:9	past 6300:18	6174:4,11,	6204:7,16,
paragraph	participatin	path 6301:15	20	23
6040:7	g 6152:1	paths	6175:1,3,9	6205:5,14,
6049:4	particular	6021:17	,13,21,25	22,25
6051:11	6021:19	6114:7	6176:11,22	6206:8,17
6103:15	6029:21	pathway	6177:3,5,1	6207:10,17
6109:17,25	6068:11	6213:17	7	,23
6123:20	6076:7	6214:5	6178:4,10,	6208:10,17
6125:17	6078:17	pattern	14,16	6209:5,11,
6126:2,24	6080:9	6146:10,12	6179:12,16	23
6165:13	6081:2	Patti 6015:5	,21	6210:7,12,
6171:10,15	6097:3	6016:20	6180:1,15,	16,22
,18	6099:11	6148:2	20	6211:3,14,
6172:2,9,1		6149:18	6181:6,14,	19
1,16,19			24	6212:2,7,1
6176:7			6182:4,11	2,16,22
6194:10			6183:3,7,1	6213:6,16,
			9	21
			6184:3,14,	6214:4,10,

24	6244:2,8,1	6194:4	PDF 6051:10	6110:13
6215:20,23	3,21	6195:4	PDP 6116:14	6112:12
,24	6245:2,8,2	6197:13		6113:14
6216:11,18	2	6214:22	Peaco	6118:8,14,
,23	6246:5,12,	6216:16	6016:6,17	25
6217:2,9,1	17,24	6219:14	6019:22	6119:4,9,1
5,22	6247:3,16,	6222:1	6021:18,25	4,22
6218:10,17	20	6223:2	6023:12,25	6120:8,17,
,24	6248:3,12,	6225:1	6024:3	22 6121:7
6219:7,10,	19,25	6228:19	6025:10,13	6122:1,6,1
18,25	6249:18,20	6231:11,22	6026:18	4 6123:6
6220:6,10,	6319:1	6232:10,21	6027:2,25	6124:12
13,17,23	PAUSE	6234:8	6029:5	6125:7,15
6221:3,11,	6035:4,9	6235:1	6041:22	6126:14,21
16,23	6037:11	6239:3	6043:9,13,	6127:14,23
6222:5,16,	6040:24	6242:14,23	16,23	6128:21
20	6050:8,18,	6245:15	6044:5	6129:2,7
6223:6,15,	23 6064:23	6249:6	6045:12	6130:13
17,24	6071:20	6252:21	6046:2,9	6131:6
6224:3,19	6080:19	6255:25	6047:15	6151:16,22
6225:3,14,	6082:21	6257:12	6049:19	6152:15
19	6088:8	6260:7	6050:20	6153:20
6226:1,10,	6094:8	6261:11	6053:23	6154:5,17,
14,24,25	6095:8	6263:15	6055:22	23
6227:12,14	6098:7,18,	6267:8	6058:4	6155:4,9,1
,17	24 6099:8	6273:12	6059:22	5,24
6228:2,9,2	6103:4,17	6275:15	6061:19	6156:2,11
1	6105:6	6278:16	6066:14	6157:15,22
6229:4,8,1	6117:16	6279:16	6068:15,24	6158:14,24
3,18	6122:4,11	6281:17	6069:3,17	6159:4,10,
6230:2,10,	6123:4,17	6284:1	6071:18	15 6160:15
14,22,25	6128:11,15	6289:9	6072:1,25	6161:7,14,
6231:2,14,	6130:3	6291:20	6073:21	22 6162:3
24	6134:20	6299:11	6075:15	6163:7,16,
6232:12,23	6162:6	6304:4	6076:13	23
6233:7,12,	6164:3	6305:5	6079:14	6164:5,10,
22	6166:12	6306:15	6083:24	16
6235:3,4,1	6171:22	6307:25	6087:16,23	6165:14,24
0,13,16,20	6173:17	6310:16	6088:10,18	6166:24
,22	6174:1,15	6313:20	,25	6167:9,14,
6236:3,14	6175:23	6315:4	6089:4,7,2	17
6237:2,14,	6176:14,21	pay 6103:25	1	6168:1,5,1
21	6177:9,15	6108:14	6090:9,12,	0,20
6238:4,13,	6178:8	6180:1	23 6091:12	6169:2,20
16,20,24	6179:10	6259:24	6092:7,14,	6170:23
6239:5,18,	6181:22	6303:21	23 6093:14	6171:7,12,
22	6183:1	6305:1	6099:10,16	24
6240:2,8,1	6184:1	payment	,20	6172:8,12,
5,21	6185:23	6101:15,24	6102:21	15,21
6241:3,8,1	6188:4,24	6140:18	6106:3	6173:3,10,
3,21	6189:4,21	payments	6107:8,21	14,22
6242:3,6,9	6191:8,15,	6142:4	6108:5,10,	6174:3,10,
,16,25	20 6192:8		16,24	17,24
6243:16,23			6109:3	6175:2,8,1

2,19	6207:16,22	6238:3,10,	6314:3,7,1	6141:12
6176:1,6,1	6208:9,15,	15,19,22	1,14,16	people's
6	25	6239:1,13,	6315:6,10,	6087:4
6177:1,4,7	6209:9,22	21,24	14,20,25	Peoples
,11,17	6210:1,11,	6240:7,14,	6316:24	6135:1
6178:1,6,1	15,20	20	6317:14	per
0,13,15	6211:2,11,	6241:2,7,1	peak 6119:24	6170:7,11,
6179:7,15,	18	2,20	6120:14	15 6179:4
20,25	6212:1,4,1	6242:2,5,8	6121:4	6187:1
6180:13,19	1,14,20	,12	6123:24	6202:8,21
6181:4,12,	6213:4,13,	6243:15,22	6124:14	6203:18
19	19	6244:1,7,1	6161:2,18	6204:17
6182:3,10,	6214:2,7	2,20,25	6164:25	6205:1
18	6216:10,20	6245:7,17	6187:15	6226:1
6183:6,9,2	6217:1,8,1	6246:2,10,	6212:24	6228:11
2	4,21	14,23	6217:19	6230:6
6184:11,16	6218:7,16,	6247:2,15,	peaking	6231:6,8
,24	23	19	6187:22	6232:6
6185:2,10,	6219:5,8,1	6248:2,9,1	peaks	6233:1,8,9
15,25	6,24	8,19,22	6124:16	6235:6
6186:3,9,1	6220:5,9,1	6250:8,10,	Peguis	6236:7,24
1,15,17	2,16,22	15	6140:16,19	6238:8,9
6187:10,18	6221:2,10,	6251:6,15,	penalties	6239:11
,24	15,21	22	6290:14	percent
6188:13,19	6222:3,14,	6252:1,3,1	penalty	6030:22
6189:6,12	17	6,23	6297:14	6031:4
6192:12,14	6223:4,13,	6253:5,11,	6299:25	6032:1
,15,23	16,22	19	6315:18	6040:16,17
6193:4,8,1	6224:1,6,2	6254:2,18,	Pennsylvania	6051:16,19
5	2	23	6213:10	,22,23
6194:1,21	6225:10,18	6255:1,5,1	people	6052:7,24,
6195:22	,25	2,16,17,21	6023:23	25
6196:4,9,1	6226:9,12,	6256:1,7,1	6043:21	6053:13,14
3,19,22	20	7,20,25	6055:23	6056:13,14
6197:5,15,	6227:11,13	6257:7	6096:23	6060:17
21	,15	6258:4,11,	6114:5,13	6062:18
6198:6,16,	6228:1,8,1	18,25	6135:8	6064:3,4,5
20	7	6259:3,11,	6136:18	,6,7
6199:3,16,	6229:1,6,1	18	6140:22	6070:20
21	1,16	6260:1,17	6141:24	6091:6
6200:8,12,	6230:1,8,1	6261:1	6144:11,12	6100:8
17,22	2,21,24	6262:4,8,2	6146:7,9,1	6101:4
6201:3,11,	6231:1,13,	1 6263:4	7 6149:13	6104:9
17,23	19	6264:5	6157:13	6154:14,25
6202:3,10,	6232:7,15	6266:10,13	6190:2,4	6155:13
15,18,22	6233:3,11,	6267:2	6272:12	6157:19,20
6203:6,14,	13	6268:17	6280:10	6159:20,22
21	6234:2,10,	6269:1,7,1	6299:6	,24
6204:5,15,	17,23	4,17	6310:13	6160:1,5,1
20	6235:4,9,1	6301:7	peoples	1
6205:1,13,	2,15,18,21	6303:1		6161:1,9,1
21,24	6236:1,13	6308:16		7 6163:3
6206:7,10,	6237:1,13,	6313:4,7,1		
20	20	4		

6164:21	6316:3	6174:5,8,2	phase 6028:5	6122:24
6174:9,10,	perform	1,22	phonetic	6213:9,10,
17,19,25	6105:21	6175:15	6133:22	13,18
6175:4,6,1	6175:13	6179:17	6139:9	Pla 6288:4
1,17	6290:5	permitting	6143:22,23	placed
6179:19	performed	6208:5	,24	6195:20
6183:13,15	6031:10,11	persist	phrase	places
6184:9,13,	6037:19	6028:17	6172:9	6084:9
17,22,23	performing	person	phrasing	6155:11
6187:5,8	6111:18	6076:15	6100:25	6195:12
6189:19	performs	6233:14	physical	6210:5
6199:9,10,	6243:11	perspective	6054:13	6214:3
11,13	perhaps	6028:23	6156:3,22	plait 6018:8
6203:3,8	6083:24	6032:14	6227:23	plan 6014:10
6205:11,19	6089:16	6045:22	6228:10	6020:6,7
6206:2,18,	6151:23	6047:25	physically	6021:12
22,25	6191:3	6048:2,12	6073:2	6022:9
6207:12	6249:3	6061:13	picked	6025:1,2,7
6219:11,17	6252:13	6065:4	6286:7	,8
6241:11,18	6283:3	6105:1,4	picking	6026:8,23
,22	6295:7,11	6139:11	6067:14	6029:1,17
6242:4,7,1	6319:9	6279:6	picky	6034:12
0	period	6282:25	6114:11	6036:16
6244:3,15	6086:6	6283:1	picturing	6039:13
6276:6,11,	6115:10,14	6288:9	6296:15	6069:4,5,8
20	,17,21,24	6300:13	piece 6029:9	,18,20,21,
6277:21,22	6116:5	pertain	6046:24	22
6278:2,3,4	6117:2,7	6153:25	6058:12	6070:2,5,9
,9,10	6146:11	pertaining		6071:1,3,7
6279:11	6156:25	6099:11	Piesold	6072:3,6,1
6282:6,7	6157:6	perturbations	6044:9	3
6283:5,7,8	6159:8	6060:16	6045:15	6073:1,9,1
,24,25	6162:25	6094:2	6046:22,25	5,17,18,25
6286:8	6189:18	Peter	6047:3,7	6074:1,6
6294:10	6228:5	6015:14	6049:23	6076:15
6308:7	6255:19	6016:14	6055:14	6077:15,21
6309:3	6271:18	6133:9,16,	6056:5	6078:6
6310:21	periodic	17 6134:22	6058:7,13	6080:9
6311:12	6131:20	6145:18	6060:4	6084:5,14,
percentage	periods	6147:14	6318:18	15,20,21
6184:7,8	6120:5,7	Peters	Piesold's	6085:3,10,
6244:24	6123:23,25	6015:2	6046:12	11,12,13,2
6288:5	6272:9	6317:1,5	6066:23	0,22,24
percentile	permitted	Peter's	pile 6148:9	6086:6,10,
6285:19,21	6166:21	6140:16	PJM	16,25
6286:2	6167:20,22	PETERS	6119:6,13,	6090:5,6
6287:13,14	6168:2,15,	6317:7,21,	19	6092:12,25
percentiles	18,23	25 6318:11	6120:6,13	6093:1,10
6288:5	6169:5		6121:23	6114:9
Perfect	6173:20			6118:1,2,3
6154:19				,16
perfectly				6125:9,10,

19 6126:25	6312:9,18	6265:14	6075:24	6091:5
6127:18,24	6313:6,11,	6274:25	plausible	6097:16
6128:19,24	12	6306:5,11,	6086:21	6098:15
6130:10,18	6314:1,23	13	play 6058:15	6103:21
6148:6,13	6318:13	6308:6,17	6107:15	6104:20
6149:7	planner	6310:2	6127:20	6124:3
6151:3	6228:15	6311:9	6145:22	6132:8
6157:18,25	planners	plans 6020:5	please	6150:18
6159:2,5,1	6155:10	6054:4	6020:3,11	6166:3
8,19,23	6159:18	6068:21	6034:8	6172:19
6160:23	6310:4	6071:15,24	6045:2	6177:11
6162:11	planning	6072:4,22,	6085:7	6192:13
6169:6	6020:9	23 6073:7	6094:17	6205:3
6181:16	6028:23	6074:8,23	6098:16	6207:7
6204:8,16,	6065:1	6075:8	6113:8	6209:17
19,25	6074:16,23	6076:2	6148:1	6250:21
6205:1,4	6094:20	6080:1	6255:9	6252:5,13
6206:13	6098:3	6085:15	6299:8	6267:19,23
6216:13	6110:17	6105:20,22	6312:24	6268:2
6225:6	6112:18	6106:21	6313:17	6271:14
6228:16	6119:23	6107:2	6314:20	6272:2,3,1
6234:22	6126:5	6114:17	pleasure	3 6278:22
6243:11,12	6131:4,14,	6115:19	6135:3	6280:2,21
6244:22	18	6116:15	plotted	6282:5
6246:6	6152:8,11	6117:4	6289:22	6283:24
6254:1	6153:25	6126:3	plotting	6293:25
6272:4,11	6154:4,7,1	6131:8	6245:18	6307:2
6284:20	5,17,18,20	6155:10,12	plotting	6312:4
6285:4,12,	6155:5,6,1	6159:7	6062:17	pointing
19 6286:19	1,14	6245:13	plus 6062:17	6192:24
6287:9,20,	6156:15	6265:5,11,	6071:12	points
22,24	6157:2,10,	22 6289:17	6161:3	6030:21
6288:6,7	23,24	6290:5	6163:3	6031:17,24
6289:4,19	6158:5,10	6292:10	6164:21	6032:5,17
6290:14,15	6159:2,3,8	6299:15	6206:23	6033:1
,21 6291:8	,11,12,23,	6301:10,22	point	6048:15
6292:13,15	24	6304:22	6041:25	6072:19
,25	6160:10,19	6315:9	6048:9,10	6107:10
6293:1,4,5	6175:11	plan's	6050:3,14	6205:3
,14,18,19,	6177:13	6270:7	6052:21	6225:15
20,23	6178:18	6293:17	6054:14,15	6256:8
6297:7,14,	6182:21	Plans	6055:17	6270:2
25	6185:4	6069:14	6057:6	6288:5
6298:4,13,	6186:21	plant	6058:24	6289:3
19,25	6194:14	6097:14	6059:4,10	6293:3
6299:16	6204:12	6160:25	6072:2	6311:6
6301:25	6205:10,18	6161:11	6073:22	policy
6302:16	6217:11	6197:3,9,2	6074:13	6074:19
6303:3	6218:21	0 6198:4	6076:14	6075:17
6304:13	6221:5	6203:16	6085:3,23	Pool 6119:7
6305:8	6226:3	6312:21	6086:10	6213:23
6308:13,23	6248:16	plan-to-plan	6087:1	poorly
6309:5				
6311:20				

6100:25	6277:7	6041:2,6,9	6021:5	,22 6209:8
pop 6107:21	possible	,20	prefaced	6215:15
populated	6025:4	6061:15	6097:3	6216:8
6212:23	6062:12	6062:7,15	prefer	preparing
Portage	6080:11	Potomac's	6298:6	6058:9
6014:22	6081:2	6033:5,8	6316:4	6268:12,19
portion	6199:12,19	6034:10	preferred	pres 6265:10
6024:14	6203:9	6037:2	6014:10	prescribed
6129:5	6251:19	6041:10,13	6025:2	6065:14
6158:3	6319:4	power	6026:22	6087:5
6172:4	possibly	6023:2,20	6039:13	presence
6185:18	6259:16	6025:16,24	6085:3,22,23	6137:4
6258:20	posted	,25	6204:18,25	present
portions	6018:14	6027:14	6216:13	6039:11
6031:25	6232:2	6031:13	6234:13,21	6103:25
6236:14	postponing	6088:3	6243:11	6143:5
6258:6,8	6026:11	6110:4	6244:22	6265:4,8,10
posed	postulate	6118:5,11	6246:6	6267:4,12,18
6023:14	6044:15	6119:7,11	6254:1	6268:7
6075:21	6093:18	6121:22,24	6284:20	6269:18
6117:1	postulated	6122:24,25	6285:3,18	6270:2
6149:6	6086:24	6156:25	6286:19	6313:10
6311:2	6128:9	6157:6	6287:8,20,22	presentation
6313:24	6207:6	6158:21	6288:7	6016:14
posing	posture	6162:20	6297:25	6039:14
6057:8	6096:14	6165:6,17	6298:3,4,13,19,25	6060:5
position	potential	6188:8	6299:15	6068:12
6018:5	6057:9	6213:23	6301:25	6133:10,16
6083:17	6124:25	6222:7	6303:3	,20 6141:9
6103:1	6127:1,5	6240:5	6304:12	6188:7
6133:7	6130:11	6253:25	6308:13,23	6190:3
6211:12	6135:16	6256:5,13	6311:20	6206:1
6214:20	6251:10	practical	6312:9,18	6229:20
6261:2	6290:13	6181:6	premised	6254:20
6263:25	6297:8	practice	6205:6,15	6255:4,11
6286:18	6312:14	6138:9	preparation	6257:20
6297:6	potentially	6151:9	6266:9	6303:1
positions	6048:22	6269:21	prepare	6308:3
6072:5	6131:11	precedes	6111:1	6316:25
positive	6136:12	6040:7,14	6216:7	presentation
6081:11	6137:8,24	precluded	prepared	s 6247:24
6084:14	6203:4	6154:9	6044:20	presented
6267:22	6302:23	6158:1	6047:13	6046:21
possibility	Potomac	predecessors	6145:21	6127:3
6076:11	6029:23	6250:15	6164:19	6284:8
6077:2	6030:10,12	predominantl	6180:10	presently
6090:7	,17,24	y 6265:22	6181:16	6227:3
6213:8	6031:17	preface	6199:2	President
6276:25	6036:3		6208:11,19	

6018:10	priced	6083:1	6121:1	6083:18
6132:2	6086:11	pro 6052:15	probably	6130:9
pressure	6120:12	6054:22	6022:2	6131:4,14
6091:10	6121:2	6132:19	6023:15	6133:23
6106:11	prices	proba	6039:21	6138:18
presumably	6021:14	6063:17	6044:6	6142:12
6024:5	6027:22	probabilisti	6049:20	6145:20
6119:24	6031:13,19	c 6290:15	6059:14	6273:4
presumption	6032:14	probabilitie	6063:15	6293:14
6097:20	6033:13	s 6031:25	6093:12	produce
pretty	6039:8	6032:4,21	6115:19	6127:11
6033:3	6040:3,16,	6033:1,9	6131:24	6148:12
6055:9	17 6041:11	6034:3,10	6153:21	6169:15
6071:13	6061:14	6035:15	6159:13	6292:1
6083:6	6064:18	6036:3	6214:11	produced
6092:16	6124:14	6038:25	6225:15	6025:17
6125:24	6153:15	6043:12	6238:11	6114:3
6272:16	pricing	6049:18	6252:19	6150:2
6310:10	6038:24	6051:12	6263:17	6265:13
6319:5	6043:19	6052:15,18	6292:18	production
prevail	pride 6145:3	6053:6	6301:15	6111:11
6141:17	primarily	6057:4	6310:13,24	6128:5
6281:5	6087:5	6084:12	6317:9	6228:7
prevailing	6113:16	6277:21	problem	professional
6056:17	6266:22	6278:2,9,1	6050:10	6108:15
preventing	6308:17	3	6059:10	profile
6147:3	primary	6279:9,19,	6136:25	6031:15,16
previous	6087:24	23	proceed	6032:5
6050:12	6207:19	6280:1,3	6109:18	6041:5
6101:1	6265:4,10,	probability	6250:8	6289:22
6146:24	14,17,19	6030:22,23	proceeding	6291:5,17
Previously	6267:4	6031:4	6087:9	6293:8
6016:6,7,8	6289:6,25	6032:1	6098:1	profiles
,17,18,19	6292:7	6033:5	6133:8	6292:2
6019:22,23	prime	6037:1	proceedings	program
,24	6265:18	6039:7	6018:4	6029:13
6151:16,17	principle	6040:15,16	6083:16	6070:22
,18	6099:21	,17 6048:5	6130:6	6130:17
price	prior 6021:8	6051:15,21	6133:14	6206:23
6030:5,6,9	6025:11	6052:10,11	6142:7	project
6032:16,22	6055:7	6053:20,25	6147:11,25	6028:9,11,
6041:5	6056:12,14	6054:7	6214:20	20 6029:11
6062:3,16,	,15	6056:20,21	6249:9,11	6058:24
17 6084:6	6085:5,7	,25	6263:25	6059:9
6085:1,19,	6087:14	6063:6,11	proceeds	6087:14,15
21 6114:15	6089:25	6276:5	6130:10	6088:19
6123:25	6123:10,13	6277:10,18	process	6089:9,11,
6269:12	6288:2	6278:19	6033:23	25 6144:22
6309:8	6309:20,21	6279:3	6055:16	6259:9,13,
priority	priority	probable	6056:8	20 6266:14
		6120:11	6065:3	

6274:9	6086:20	6145:12	public	6307:10
projected	6087:19,21	6148:8	6014:3,21	pursuant
6167:6	6088:14	6162:17	6109:14	6262:13
6168:15	6089:15	6193:13,17	6133:19,21	pursue
6172:6	6115:13	6215:9	6146:23	6063:3
6174:6	6130:15,24	6227:19	6210:24	6121:10
6175:11,15	6141:5	6240:9	6232:1	6297:14
6180:11	6254:1	6247:23	6266:2,3	pursued
projects	6256:11,22	6262:6,24	6317:2,8	6058:12
6057:17	proposing	6266:1	publications	6085:20
6058:15	6026:19	6296:8	6089:2	6092:6
6068:18	6057:20	6315:15	published	6301:14
6144:21	6144:9	6318:18	6136:6	pursuing
6145:5,6	proposition	provides	pull 6082:17	6208:6
6146:1	6054:12	6022:10	6160:12	puts 6106:11
6186:24	prosperity	6285:8	6211:24	6314:24
6229:25	6141:11,12	6287:7	pulling	putting
6237:25	6142:16,21	providing	6243:6	6055:20
6238:6,18,23	,23,24	6211:8,23	purchase	6065:14
6239:15,25	protect	6280:8	6269:12	6073:6
6241:5,9	6028:25	6287:3	purchases	6086:9
6259:6	protection	province	6170:19	6093:17
6260:12	6029:4	6101:6	6176:5	6112:4
promised	prov 6067:25	6142:2	6183:8	6204:24
6077:8	prove 6280:8	6143:14	purchasing	6300:11
promises	proves	6160:2	6121:22	6307:17
6141:11	6026:15	6212:17	6122:23	
6142:12,15	provide	6319:11	purely	<hr/> Q <hr/>
6144:23	6022:16	provincial	6023:19	Qual
pronounce	6025:22	6100:10	purport	6016:6,7
6249:15	6056:18	6101:22	6139:21	qualification
proper	6060:16	provision	purpose	n 6148:21
6074:22	6061:12	6158:20	6152:10	qualification
6141:2	6081:21,22	proxy	6161:8	ns 6148:23
properly	6082:9	6295:15	6207:10	6149:3
6249:15	6118:22	PUB 6033:23	6243:16	qualifier
property	6124:15	6050:13	purposes	6038:12
6270:20	6202:7	6059:15	6024:2	quantitative
proportional	6250:12	6216:3,6	6097:5	6247:12
ly 6212:24	6261:18,22	6227:19	6112:17,19	quantitavit
proposal	6262:14	6249:23	6129:10	6247:12
6053:19	provided	PUB/LCA	6156:14	quantity
6087:25	6020:20	6255:3,9,1	6159:2	6162:22
6130:15	6027:4	5	6160:10	6163:1
proposals	6049:22	PUB/LCA-20	6175:11	quarter
6089:24	6050:4	6216:2	6185:5	6307:16
proposed	6069:10	PUB/LCA-22B	6251:9	Quebec
	6070:15	6227:20	6274:20	
	6081:4		6288:10	

6137:17	,18	6047:1	6154:10,19	,25
ques 6117:19	6312:17	6061:21	6155:6,8,9	6188:6,14,
question	questioning	quite	,16,25	20
6022:4	6049:2	6020:6,22	6156:8,9	6189:1,8,1
6023:14	6125:6	6023:3	6157:8	4,24
6033:3,15	questions	6083:2	6158:16,17	6190:4,15,
6036:24	6018:15	6155:1	6159:1,5,1	24
6045:3,13,	6060:2	6246:13	1,17	6191:10,22
15 6047:16	6074:17	6268:11,19	6160:8,9,1	6192:3,10,
6053:4,5,8	6112:23	quiz	8	21,22
6055:12	6113:2,7,1	6107:21,22	6161:8,15,	6193:1,6,1
6065:5	0,16	quote	24 6162:8	2,16
6069:18	6117:19,21	6138:11	6163:8,19,	6194:6
6072:9	6118:1	6165:6	25	6195:6
6075:21	6122:19	6172:19	6164:7,11,	6196:1,7,1
6079:3	6124:20,21	6182:11	17	1,15,20,23
6088:11	,22,24	6186:19	6165:15,25	6197:6,17
6090:25	6127:16	6211:15,18	6166:14	6198:2,8,1
6091:18,25	6131:22	6254:7	6167:1,10,	8,21
6092:8	6147:8	6261:15	15,19	6199:4,18,
6093:24	6151:8	6266:18	6168:2,7,1	23
6097:3	6207:9	quoted	2,22	6200:10,13
6099:11	6250:12,13	6137:20	6169:3,22	,18,24
6100:18,25	6263:9	quotes	6170:24	6201:6,14,
6101:1,8,1	6308:21	6181:25	6171:9,14	19
4	6310:14	6212:3	6172:1,10,	6202:1,5,1
6102:1,2,4	6319:8		14,17,25	2,16,19,24
6113:23	Quewetin		6173:8,12,	6203:7,15,
6116:25	6133:21		19,24	23
6122:16	quick 6063:5	RA 6188:11	6174:4,11,	6204:7,16,
6125:25	6247:4	racially	20	23
6129:9,24	6249:20,25	6146:8	6175:1,3,9	6205:5,14,
6145:9	6319:7	raised	,13,21,25	22,25
6149:6	quickly	6177:22	6176:11,22	6206:8,17
6152:22	6215:1	6213:7	6177:3,5,1	6207:10,17
6189:7	6218:18	raises	7	,23
6195:23	6247:4,8	6077:7	6178:4,10,	6208:10,17
6197:16	6249:3	raising	14,16	6209:5,11,
6207:11	quilt	6108:1	6179:12,16	23
6208:19	6020:4,11,	Ramage	,21	6210:7,12,
6216:22	19 6021:10	6015:5	6180:1,15,	16,22
6222:18,25	6036:11	6016:20	20	6211:3,14,
6223:5,8	6054:1	6148:1,2,1	6181:6,14,	19
6225:11	6057:18,24	9 6149:18	24	6212:2,7,1
6232:15	6084:13	6150:1,11,	6182:4,11	2,16,22
6265:14	6289:19	17	6183:3,7,1	6213:6,16,
6275:10	6293:3	6151:3,20,	9	21
6277:16,25	quilts	21,24	6184:3,14,	6214:4,10,
6282:22	6032:19	6152:16	18	24
6284:24	6035:13	6153:22	6185:1,7,1	6215:20,23
6289:13	6045:9		2,17	,24
6304:17			6186:2,5,1	6216:11,18
6311:13,17			0,13,16,18	,23
			6187:12,20	6217:2,9,1

5,22	6247:3,16,	6281:5,8	6163:9	6110:19
6218:10,17	20	6282:6,7	6167:11	6131:11
,24	6248:3,12,	6283:24,25	6236:11	6134:5
6219:7,10,	19,25	ratepayer	reading	6157:3
18,25	6249:18,20	6270:8	6027:3	6209:16
6220:6,10,	6319:1	ratepayers	6031:23	6307:3
13,17,23	Ramage's	6021:24	6048:9,10	6312:15
6221:3,11,	6250:13	6090:6,14	6089:11	6313:11
16,23	ran 6063:24	6091:8,10	6102:15	6319:7
6222:5,16,	6064:1	6092:3,19,	6120:19	real-time
20	6065:18,19	22 6093:2	6139:14	6155:17
6223:6,15,	6069:9	rates	6170:1	reapply
17,24	6070:14	6061:22	6171:13	6090:7
6224:3,19	6296:1	6062:21,24	6176:7	reason
6225:3,14,	Randolph	6063:1	6194:9	6052:1
19	6264:15	6064:2,18	6195:8	6055:7
6226:1,10,	range	6066:10	6236:25	6089:22,24
14,24,25	6041:20	6103:12	reads 6115:5	6139:18
6227:12,14	6045:18	6104:8,10,	6116:11	6141:2,13
,17	6046:15,22	12,16	ready	6146:12
6228:2,9,2	6055:8	6113:17,25	6083:16	6150:20
1	6065:22	6114:6	6113:5	6271:13
6229:4,8,1	6066:7,11,	6115:7,12,	6147:17,24	6288:12
3,18	18	15	6250:7	6315:12
6230:2,10,	6095:21,22	6117:1,6	real 6026:12	reasonable
14,22,25	,24 6104:8	6276:18,19	6073:17	6046:3
6231:2,14,	6116:4	6277:1	6112:15	6058:10
24	6203:3,9	6280:17	6155:22	6060:14
6232:12,23	6238:7	rather	6156:10,11	6161:25
6233:7,12,	ranges	6220:20	6157:20	6241:22
22	6048:18,23	6288:20	6276:6,10,	reasonably
6235:3,4,1	6055:24	6306:18	18 6282:6	6026:1
0,13,16,20	6067:7	6308:7	6290:20	6120:12
,22	6105:2	rating	realization	6121:2
6236:3,14	rate	6156:18	6074:2	reasons
6237:2,14,	6063:1,8,1	ratings	realize	6062:6,13
21	2 6067:2	6156:12	6271:4	rebuttal
6238:4,13,	6091:9	re 6014:7	realized	6166:19
16,20,24	6103:21	6177:18	6040:12	6187:14
6239:5,18,	6104:21	6303:4	realizing	6190:9,17
22	6114:7,9	reach	6027:6	6191:1,4,1
6240:2,8,1	6116:2,16,	6140:25	really	1
5,21	20 6143:8	reached	6029:15	6193:13,16
6241:3,8,1	6203:1,2	6100:16	6045:14	6262:6,18
3,21	6267:12	6102:23	6055:13	6265:1
6242:3,6,9	6269:8,11	6140:17	6059:20	6276:15
,16,25	6274:19	react	6062:24	recall
6243:16,23	6276:4,6,1	6183:21	6088:20	6132:12
6244:2,8,1	0,11	reader	6089:7,22	6153:19
3,21	6278:3,4,5		6107:14	6206:6
6245:2,8,2	6279:4,7			
2				
6246:5,12,				
17,24				

6208:8	6127:18	6226:18	reevaluating	6276:14
6209:11,22	recollect	red 6068:16	6131:2	6277:22
6211:9	6148:23	6071:16	ref 6059:18	6278:3,10
6212:4	recollection	6080:17	6064:4	6283:15
6253:19	6233:4,14	6081:10	6278:14	6292:14
6264:21	recommend	6188:21	ref/ref/high	6293:23,25
6265:6,7	6077:6	6189:2,9	6038:22,23	6313:10
6269:23	recommendati	6223:11	ref/ref/ref	reference/
6273:19	on 6059:25	6224:4,12,	6034:15	reference/
6276:22	on	13 6225:22	6038:21	reference
6278:6	recommendati	6226:5	6288:20	6081:24
6284:21	ons	6244:21	6290:25	6082:5,10
6286:4	6061:23	6284:13	6291:2,5	referenced
6313:13	6067:2	redacted	refer	6084:1
6314:2	6090:16	6122:7	6121:14	6187:4,14
receive	reconcile	redactions	6123:20	6190:5
6024:16	6115:11,14	6109:9,20	6177:18	6191:1,4,1
6225:21	6117:8	redistributi	6243:5	0,12
6318:25	record	ng 6036:3	6254:4	6253:14
received	6080:4,12	redo 6067:19	6260:3	6254:20
6030:17	6146:23	6092:16	6276:15	6255:3,4,1
6079:14,15	6147:11	redoing	reference	0 6257:21
,16 6132:3	6152:18,21	6032:25	6030:21	6262:11
6315:11	6160:22	redrawn	6031:5	references
receiving	6162:10	6303:4	6035:12	6040:16
6133:25	6163:20	reduc	6039:1	6100:8
recent	6166:15	6305:20	6041:23,25	referencing
6020:21	6170:2	reduced	6051:14	6186:7
recently	6184:21	6048:5	6052:16,25	referred
6130:24	6199:8,9,1	6302:22	6053:10	6086:16
6281:3	2,14	reduces	6055:9	6091:3
recessing	6200:5,14,	6295:7	6056:12,13	6113:18
6083:12	16,19	reduction	,14 6057:1	6182:15
6133:3	6201:1,8,9	6224:7	6063:13,21	6192:25
6147:20	,13 6204:2	6294:14,23	6064:3,7	6206:18
6214:16	6213:9	6302:10	6069:19	6219:11
6263:21	6243:3,5,1	6303:21,22	6070:3,7,1	6230:16
reckless	9,23	,24	0,19	6236:11
6228:15	6244:6,11	6304:7,10,	6071:8	6253:18
recognize	6246:21	12,21	6116:8	6259:6
6223:7	recorded	6305:1,20	6175:20	6271:20
6226:15	6162:14	reductions	6191:12	6284:24
6240:16	records	6070:25	6192:18	referring
6270:22	6136:8	reenforcemen	6197:8,19	6041:10
recognized	recover	ts 6235:19	6198:3	6090:9
6084:8	6226:4,10	re-estimate	6206:2,4	6098:12
6139:5	recovered	6054:11	6208:18	6115:24
6248:7	6227:9		6209:13	6124:17
Recognizing	recovering		6217:12	6125:3
			6231:16	6155:3,6
			6232:5	6164:6

6178:2	6187:5,15,	6313:25	6310:19	remain
6190:11	21,22	relates	relevance	6099:15
6191:18,24	6189:16	6044:24	6033:21	6218:6,14
6193:9	6191:12	6099:14	6114:22,25	remaining
6195:24	6193:20	6103:11	relevant	6278:20
6208:16	6209:24	6122:19	6055:24	remarks
6218:20	6213:10,22	6125:9	6058:1	6134:15
6229:7	6236:20,22	6226:7	6065:22	remember
6230:9	6237:15,16	relation	6066:6,11,	6039:10
6232:8,17	,23,24	6023:10	18	6045:4
6235:24	6238:2,17	6053:5,6	6067:6,8	remembers
6245:5	6240:17,24	relative	6073:11	6107:22
6252:14	6241:4,9,1	6022:23	6097:17	remind
6253:1	8,23	6025:10	6119:6	6034:24
6256:17	6256:13,16	6053:21	6272:8,17	6148:20
6261:25	regional	6070:2	reliability	remiss
6262:1,9	6119:6	6075:16	6156:15	6096:5
6290:1	6237:7	6076:11	6157:4	remove
6303:23	regionally	6093:10	6178:3	6038:25
refers	6260:23	6096:17	reliable	removes
6101:6	regions	6117:2,3	6112:11	6063:10
6159:20	6193:2	6179:21	6158:20	removing
6169:18	6207:21	6183:20	reliably	6039:7
6180:21	6237:11	6184:19	6152:13	6092:25
6192:2	6259:16	6185:13	reliance	renewable
6244:22	region's	6195:1	6178:22,25	6260:13
6265:2	6187:8	6243:11	6186:25	renewables
reflect	Regis	6298:20	6308:6	6128:5
6104:1	6014:13	6304:14	Reliant	reorganize
6282:24	regulatory	6308:13	6170:14	6083:1
reflected	6211:5,7,2	relatively	relied	repairing
6033:14	0,22	6037:20,21	6020:22	6144:17
reformulate	6249:21	6234:11	6157:25	repeat
6066:6	6250:1	relax	relocation	6100:17,24
refresh	reinvestigat	6157:19	6140:16	6120:18
6149:5,11	es 6130:11	6158:7	rely 6113:24	6163:12
6208:15	reject	6218:19	6154:8	6164:13
6255:22	6144:21	6310:20	6176:18	6277:25
refs 6061:25	rela 6093:9	relaxation	6178:18	6283:15
regarding	relate	6308:5,14	6210:4	6289:13
6052:21	6113:16	6311:21	6228:12	repeated
6124:20,22	6155:1	relaxed	relying	6101:2
6131:5	related	6073:7	6030:16	6162:15
6217:18	6052:6	6297:9	6047:2	rephrase
6290:10	6053:8	6311:19	6176:2	6088:4
6297:3	6086:5	relaxing	6182:24	6121:19
regardless	6099:14	6072:22	6183:15	
6309:5	6222:19	6205:10,18	6225:12,16	
region	6293:17	6218:20		
6136:17		6309:3		

replace	6251:9	6268:22	6317:2	reshape
6170:19	6252:14	6280:25		6124:15
6176:5	6254:5	6282:11	required	resi 6271:2
	6259:8		6127:22	
replicate	6266:4,9,1	represented	6152:14	residual
6110:23	2,14,17,19	6183:24	6161:3	6268:2
reply 6153:3	6268:12,13	6206:21	6170:19	6271:1,10
	,16,18	6258:23	6176:5	
report	6270:6	6295:23	6217:3,6	resist
6029:22	6273:15		6218:5	6317:17
6030:2	6282:4,12,	represents	6220:25	resolve
6033:4	17,24	6020:14	6259:25	6055:4
6041:14,15	6284:12	6064:4		resource
6042:22		6174:8	requirement	
6046:21	reporter	6175:17	6270:9	6028:23
6049:8	6169:10	6179:18	6274:18	6065:1
6058:9	reporting	6181:8	6275:2,19	6071:4,6
6084:9	6030:21	6184:8		6073:24
6094:19	reports	6201:20	requirements	6126:7,9
6101:4	6062:17	6220:2,14,	6104:25	6129:14,16
6105:13	6066:9	18 6238:5	6165:5,9,1	,19 6145:5
6109:2,4,5	6105:12	6244:3,17	6274:10	6169:6
,20	6112:9	6258:1,16	6295:8	6170:4
6111:2,5	6132:5	6260:19		6181:16
6113:17	6145:20	6284:14	requires	6186:21
6115:3	6194:23		6161:16	6188:7
6116:7,9		reproduce	6171:4,16	6193:19
6117:9	represent	6038:2	6177:23	6194:14
6124:23	6113:15	reproduced		6228:15
6125:4	6117:21	6150:22	requiring	6248:16
6133:25	6174:7	6160:21	6163:11	6265:11,14
6135:20	6175:10	reproduces	6164:12	,22 6272:4
6152:7	6223:21	6194:9	rerun 6032:7	6274:25
6163:10	6277:18	request	Research	6312:2
6165:4		6207:24	6133:22	resources
6169:25	representati	6216:2,3		6121:3
6177:18,20	on 6085:8	6247:23	reserve	6123:12
6182:16	6163:18	6259:23,25	6140:16,19	6124:22,25
6186:7	6180:14	6260:20	6160:24	6125:22
6187:4,13	6181:20	6261:3	6161:3,9,1	6126:6
6190:5	6185:16	6262:15	7,18	6128:3
6191:13	6187:11,19	6294:18	6197:2,9,1	6130:21
6192:14	6203:22	6313:23	9 6262:7	6136:7
6194:2,7,9	6212:21	6319:4		6152:12,13
6196:14	6233:21		reserves	6162:12,17
6208:21	6252:6	requested	6197:22	6163:11
6229:22		6051:6	6198:4	6164:12
6230:20	representati	6294:22	6261:7,8,1	6165:20
6236:9,11,	ve 6038:2		9	6166:2,4
15	6082:6	requests	6262:16,20	6170:4,14
6237:5,12	6239:11,14	6050:13		6171:4,17
6241:22	representati	6190:17	reservoir	6177:24
6243:6,9	ves	require	6153:16	6187:3
6248:9	6062:22	6166:4	reservoirs	6210:17
		6208:4	6124:9	

6212:25	6276:17	6125:19	6209:13	6021:3
6216:19	6277:17	6127:11	reverse	6034:15
6220:19	6286:15	6246:3	6040:6	6070:8
6221:6,13	6306:5,9,1	resume	review	6186:14
6222:8	0 6313:16	6083:16	6014:9	6200:7,11
6272:4	6314:6,20,	6147:24	6046:14	6241:4
6281:20	22	6214:14,20	6051:1	6297:19
6283:21	responses	6263:25	6099:5	rights
6312:1	6148:8	resuming	6101:21	6134:9,23
respect	6247:23	6083:13	6130:8	6135:9,17,
6024:25	6257:21	6133:4	6194:16	18
6029:23	6314:8	6147:21	6218:18	6137:13,22
6030:1	responsibili	6214:17	6238:2	6138:7,14
6043:8	ties	6263:22	6247:20	6139:1,7
6061:13	6135:10	retain	6248:3	6140:9
6064:17	responsibili	6079:8	6314:6	ripe 6028:20
6066:9	ty 6138:17	retained	6319:4	risk
6068:16	6158:19	6210:23	reviewed	6084:6,12,
6069:14	rest 6158:4	retirement	6046:11	17,19,22
6080:8	restating	6270:20	6264:22	6086:5
6081:3	6209:21	RETIREES	6274:4	6287:20,21
6084:4,12	restrict	6133:1	6294:9	,23,24
6088:24	6186:21	6319:20	6304:8	6289:22
6097:3	6194:13	return	6313:15	6290:11
6098:10	restriction	6024:6,11	6314:8	6291:1,4
6100:7,9	6154:3,25	6267:12	reviewer	6292:2
6107:9	6155:2	6269:8	6110:8	risks 6025:7
6108:22	6157:19,20	revel	reviewing	risky
6112:2,10	,23	6033:21	6131:8	6084:15,18
6145:13	restrictions	revenue	6276:22	River
6207:17	6154:2	6024:16	6297:2	6187:13
6254:21	result	6062:3	revised	rivers
respond	6047:7	6104:25	6020:24	6138:7,21
6064:16	6066:25	6244:23	revision	6213:1
responding	6089:17	6245:11,24	6037:5	road 6059:21
6190:16	6107:25	6246:1,7	revisions	6144:16
response	6124:8	6270:8	6127:5	6145:7
6017:16	6178:23	6274:18	revisit	6146:7
6034:1	6203:17	6275:2,19	6295:2	robust
6099:5	6216:5	6293:15	reward	6046:1
6148:10,17	6269:18	revenues	6285:21	robustness
6207:23	6315:21	6023:9	Richard	6046:14
6208:2,8	results	6024:17	6014:16	rodeo 6190:1
6216:1,22	6042:17	6062:18	6073:16	role 6074:22
6227:19,21	6070:15	6245:12	6075:4	6124:25
6231:4,25	6073:4	6246:8,19,	6299:24	6127:20
6232:16	6111:4,9,1	22 6266:25	right-hand	6145:22
6236:5,12	1,13	6267:19	roles	
6254:24	6116:12	rever		
6255:9,13				
6262:24				
6275:18				

6045:25	6112:5	6125:8,16	6045:21	6050:6,21
roll 6170:23	6252:10	6126:15,22	6046:12	6056:23
6308:24	6309:17	6127:15	6065:13,15	6070:14
Roman	6310:7	6128:13,17	,17,20	6101:10
6057:10	6311:4	,23	6067:24	6109:24,25
room 6076:22	6312:11	6129:3,25	6075:21	6122:2,6
6311:8	runs 6032:23	6130:5,25	6076:17	6125:17
6317:16	6253:2	6131:21	6087:8	6137:10
Ross 6264:14	6296:18	6213:6,22	6091:15	6141:8
roughly		save 6295:15	6093:4	6149:19
6064:4	<u>S</u>	savings	6102:9	6178:6
6180:7	safe 6158:20	6128:4	6204:22	6180:2
6185:14	safeguard	6205:8,16	6247:16	6205:16
6223:12,21	6161:9	saw 6045:9	6300:2,7	6217:2
6226:11,16	sage 6317:9	6109:10	screen	6275:18
6238:7	Sahtu	scenario	6036:12	secondly
6241:11	6136:17	6051:14,20	6163:23	6072:23
6260:11	6137:18,21	6086:21,24	6190:12	6134:12
round 6064:1	sale 6027:1	6121:12	6224:12	secretary
6231:5	6245:12	6124:2	6250:21	6018:13
6313:18	sales	6128:7	screened	6132:11
rounding	6085:11	6204:20	6126:18,19	section
6108:11	6245:11	6207:5	screening	6057:10
row	6246:1,7,8	6234:11,14	6232:18	6243:8
6167:8,9,1	6293:15	,21	6300:21	6245:5,10
1,12	sample	6279:4,7	scrip	6247:1
6168:17	6236:21	6284:14	6140:21	sections
6217:9	sanctioned	6313:1	scroll	6124:23
RTOs 6120:16	6132:6	scenarios	6049:3	seeing
6121:3,6	Saskatchewan	6052:19	6261:14	6072:23
run 6036:25	6212:9,13	6057:24	S-curve	seem 6077:7
6037:9,15	sat 6076:22	6064:17	6031:15	6091:24
6064:20	satisfied	6080:16	6286:20	6299:9
6066:12	6151:12	6105:25	S-curves	seemed
6077:18	Saunders	6106:8	6032:18	6101:19,21
6079:12	6015:21	6216:4	6033:4	6140:11
6093:22	6016:12	6278:20	6034:1	6283:4
6094:2	6117:18,20	6288:21	6043:12	seems
6110:24	,21,24,25	schedule	se 6204:17	6042:10
6140:6	6118:10,19	6265:1	6205:1	6190:12
6148:4	6119:2,5,1	6318:22	season	6232:17
6277:14	0,18	scheduling	6119:11	seen 6026:7
6299:7,8,9	6120:4,10,	6318:20	6120:14	6073:23
6303:11	20,25	scheme	6121:4	6098:22
6310:5,11	6121:13	6211:5,20	seasonal	6101:5
running	6122:13,17	6263:1	6119:15	6110:12
6032:16	6123:15,19	scientific	6256:6,15,	6135:10
6064:16	6124:18	6056:7	24	6166:24
6081:5,9		scope	second	6177:12
				6190:22

6191:6	6062:3,17	served	6273:8	shooting
6193:10	6063:4	6224:8	6277:2	6103:8
6211:9	6065:6,14	serves	6281:5	shop 6233:14
6249:10	6066:2,4,1	6022:11	6297:24	short 6034:9
6300:2	7 6067:5	service	several	6054:17
6307:8	6280:6	6097:4	6118:17	6067:21
Seewee	sensitivity	6162:19	6127:1	6083:6,22
6139:9,14	6044:14	6205:9,17	6139:20	6086:15
selected	6056:3,23,	6219:3	6281:3	6100:7
6243:17	24 6057:9	6259:22,23	6288:14	6113:10
selection	6062:16	,25	severe	6117:21
6105:19	6063:8,24	6260:20	6184:21	6159:16
6106:20	6064:2,19	6261:4	sexual	6250:12
self 6177:22	6067:13,17	6266:3	6147:4	6309:14
self-	6148:13	6274:19	sexually	6310:12
sufficienc	6247:18	sets 6070:25	6146:24	6317:19
y 6178:2	6248:4	setting	shaded	shortage
Selkirk	6276:4	6042:14	6257:25	6198:7
6309:17	6280:9,14,	6158:11	6258:6,15,	shortcut
6310:5,7	15	settled	20	6223:7,9
sell 6119:20	sent 6078:23	6140:22	shading	shorter
6271:20	6319:3	seven 6042:6	6244:2,16,	6270:22
6309:8,11,	sentence	6086:12	18 6259:3	6272:9
14	6099:12	6103:21	Shaffer	Shortfall
selling	6115:3	6104:20	6149:7	6227:8
6271:20	separate	6184:11	shaking	shorthand
send 6144:21	6068:10	6239:7,10	6159:14	6156:18
sense	6150:21	6240:18	shared	Shot 6107:16
6027:18,23	separately	6286:12	6260:23	shou 6096:22
6029:11	6206:9	6287:14	6318:21	showed
6036:9	6218:11	seventeen	sharing	6056:2
6054:21	September	6070:13	6090:17	6085:1
6076:20	6232:1	6235:5	sheet	6092:12
6077:19	6281:21	6236:7	6017:15	showing
6089:3	sequen	6239:6,7	6132:4,16	6053:7,22
6131:18	6243:12	seventy	Shefman	6058:25
6141:18	sequence	6035:21	6015:22	6074:7
6272:20	6127:7	6036:15,19	Sherco	6095:4
6293:7	6243:12,17	6097:20	6203:11	6109:8
sensitive	,20	6297:23	she's 6213:7	6234:13
6029:25	sequencing	seventy-	shift 6048:8	6284:10
6066:25	6106:25	eight	6246:7,10,	6285:3
6067:1	series	6039:15	12,22	6286:21
6291:1	6274:17	6079:25	6278:13	6291:6
sensitivitie	serious	6094:14,20	shifted	shown
s	6135:8	6095:23	6047:5	6026:24
6057:2,15,	6137:9	6096:2,24		6038:3
25 6061:2	6138:21	6097:8		6111:2,12
		6268:3		
		6270:13		

6121:25	y 6140:23	6049:13	6286:1	6089:19
6123:1	6246:13	6102:18	size 6096:17	smart 6170:5
6177:12	6300:8	6107:7	6156:1	snappers
6223:10	signing	6194:15	6179:22	6250:13
6284:9	6142:20	6318:11	6183:20	so-called
6298:14	signs	sit 6215:15	6259:1	6139:20
6304:13	6135:23	site 6109:14	sized	social
6305:9	s'il 6018:8	site-	6025:16,24	6134:13,14
shows 6022:8	simil 6245:4	specific	skip 6217:15	6141:9
6084:13	similar	6242:11	sled 6316:3	6142:3
6085:4,5,1	6024:16	sits 6153:18	sleep	6143:8,18
4,18	6062:20	situa	6292:20	6144:7,12,
6086:9	6110:15	6271:17	sleepwalking	14,19
6107:24	6162:4	situate	6144:20	6146:19
6111:10	6165:9,18	6020:11	slide	software
6288:3	6189:15	situation	6020:23	6110:18
6294:5	6194:23	6041:2	6026:24	6286:8
6297:18	6239:25	6049:14	6068:13	solar
6299:25	6245:4	6059:20	6078:17	6124:21
6301:21	6248:14	6143:5	6081:3,7	6126:20
Shuswap	6280:5	6212:13,19	6148:13	6127:19
6135:2	6295:20	six 6020:6	6188:10,15	sold 6271:1
sight	6303:18	6021:21,23	6190:11	Soldier
6151:13	similarly	6027:12	6191:25	6014:15
signature	6062:21	6034:17,18	6229:19	solely
6135:24	6246:25	6042:5	6230:11	6077:23
6136:4,10,	Simonsen	6047:20	6294:6	solid
23	6018:18,21	6252:17	6296:25	6220:7,13
signed	6132:13	6293:25	6301:20	6224:4,12
6051:25	6214:25	sixteen	6302:25	6226:5
6135:8,25	simple	6302:18	6303:3	solution
6136:6	6136:22	sixty 6180:8	6304:7,13	6127:12
6137:3,6	6270:18	6280:17	6307:16	solve
6139:21	simply	6286:11	6308:3	6269:11
6212:9	6023:24	6287:13	6312:23,24	somebody
significance	6060:18	sixty-nine	slides	6089:8
6139:2	6094:3	6277:4	6068:3	somehow
significant	6129:22	6280:22	6190:14	6104:1
6043:21	6195:24	6281:8	sloping	6143:11
6107:24	6224:12,13	sixty-one	6220:1,7	6166:15
6108:18	6228:14	6201:18	small	someone
6115:8,16,	6248:10	sixty-seven	6048:21	6095:12
20 6117:5	simulate	6095:2	6128:3	6146:3
6124:3	6057:5	6097:6	6144:16	6300:12
6134:7	6110:2	6286:3	6145:25	6317:7
6138:19	sir 6028:22	sixty-two	6212:24	sometime
6139:17	6029:19	6285:22	6315:22	
6140:6,13,	6036:9,14,		smaller	
18	24 6042:3			
significanttl				

6144:15	6261:13,16	6026:4	6238:17	6022:6
somewhat	6262:12	6118:22	specifically	sponsored
6044:18	6265:16	6124:10	6044:10	6146:4
6054:12	6271:7	6213:2	6046:10	spot 6306:7
6122:19	6277:25	6236:6,8	6052:21	SPP
6125:1	6282:13	sourced	6129:11	6119:7,13,
6130:17	6284:4	6104:16	6206:12,15	19
6137:20	6299:15,20	6129:6	6208:16	6120:6,13
6211:5,20	6307:15	6162:19	6242:20	6121:23
6282:1,14	6310:6	sources	6307:10	6122:24
somewhere	6313:22	6023:1	specified	6213:22
6078:18	sort 6023:13	6120:13	6137:14	6214:6
6079:10	6024:15	south	speculate	spring
6200:23	6029:6	6023:2,6	6304:23	6141:15
6225:8	6044:11,14	6119:17	Speeds	St 6140:16
6241:10	,17	6237:17	6237:8	staff
sor 6036:11	6046:16	6261:17	spelled	6247:25
sorry 6040:4	6047:3	6270:20	6134:17	6295:16
6051:8	6074:2,18	Southwest	spend 6297:2	stakeholders
6098:11	6077:18	6119:7	spending	6251:3
6099:2	6079:17	6213:23	6029:4	stand
6100:24	6094:4	space	spent	6073:18
6113:6	6106:7	6070:23	6020:22	6107:6
6114:23	6110:22	sparsely	6028:6	6147:17
6120:17,22	6111:22	6212:23	6090:2	6202:4
6121:15,19	6130:15	speak	6111:25	standard
6122:15	6131:8	6090:15	6136:24	6110:17
6127:9	6133:20	6125:2	spirit	6166:4
6128:19,21	6147:1	6134:2	6067:19	6178:2,3
6130:8	6159:19	6147:9	spite 6137:4	6274:23
6171:7	6193:17	6268:13	SPLASH	standards
6172:17,18	6203:13	speaking	6069:9	6162:1
6173:22	6257:25	6061:3	6070:15	6177:23
6179:15	6275:2	6066:3	6108:22	standpoint
6186:9	sorts 6137:1	6165:16	6110:2	6114:14
6189:2,6,2	sound 6202:9	6182:7	6112:10	stands
3 6194:8	6209:20	6233:24,25	6245:19	6046:1
6198:16	sounded	special	6246:3	6213:14
6200:8	6207:9	6111:1	6310:10,20	star 6060:25
6203:16	6300:10	specific	,25	start 6018:4
6205:13	soundness	6045:13	6311:14	6022:1
6216:18,20	6110:11	6048:16	Split	6038:23
6219:9	sounds	6060:2	6135:23	6060:25
6220:5	6057:7	6098:16	6163:23	6082:8
6221:21	6149:13	6112:8	spoke	6084:11
6222:10	6276:12	6134:10	6214:25	6086:17
6230:14	6312:15	6143:17	spoken	6118:1
6245:24	soup 6105:15	6192:24		6145:5
6250:14	6107:10,14	6194:25		
6258:4	source			
6259:14				
6260:10				

6167:2	6169:25	6233:20	6091:14	6070:6,10,11
6187:6	6173:5	stipulation	strong	6087:17,24
6239:8	6176:8	6082:18	6126:7	6088:3,4,17,20,22,23
6249:8	6194:25	stop 6069:12	6144:7	6089:12,18
6252:14	6196:13	6096:18	structured	submissions
6264:9	6199:7,17	6143:1,2	6044:13	6051:17
6293:16	6212:5,6	6173:13	structures	submitted
6302:11	states	6272:3	6044:15	6260:21
6303:19	6088:24	storage	structuring	subsequent
6307:4	6092:17	6185:8,13	6046:13	6130:21
6316:14,19	6186:18	store	stuck	6139:21
6317:24	6237:17	6124:14	6026:14	6306:23
6318:3,9	6238:17	stored	6242:18	subsequently
started	6239:16	6124:9	studied	6262:24
6034:16	6240:4,6	story	6045:16	substantial
6042:20	6254:7	6146:23	6252:8,24	6025:15
6043:12	stating	6249:20	6256:4,12	6097:16
6086:2	6099:20	straight	studies	6113:21
6152:22	station	6083:25	6073:23	6117:11
starting	6095:1	6084:11	6156:15	substantiall
6038:16	6252:11	6101:5	6253:14	y 6117:13
6099:5	6253:9	6199:24	stuff	substation
6123:21	statistics	straightforw	6112:25	6252:10
6250:25	6285:8	ard	6307:5	6253:3
6259:7	6287:7	6037:21,22	subject	subtract
6280:1	statutory	6111:22	6058:20	6288:25
6312:4	6211:5,20	strategy	6060:4	subtracted
6316:15	stay	6121:10	6083:21	6289:17
starts	6146:11,15	6126:12	6086:15	subtracting
6029:22	6161:10	6135:5	6100:7	6293:22
6030:4	6180:2	stratified	6103:7	sufficiency
6057:9	Steering	6146:9	6156:1,3	6177:23
6061:3	6188:9	stream	6160:16	sufficient
6071:12	6189:24	6185:3	6163:21	6105:21
state 6165:6	step 6021:16	strengths	6167:16	6118:23
6197:15	6062:2	6032:8	6180:18	6152:12
6210:16,17,25	6273:3	stress	6187:17	suggest
6240:8,11	Stephen	6032:10,13	6202:20	6037:25
6269:21	6264:14	6042:6	6233:8,12	6104:6
6270:5	steps 6045:1	6043:8,10	subjective	6150:4
stated	6293:13	6044:19	6049:15	6204:17
6194:2,23	stick 6314:9	6052:9	6050:12	6315:17
6198:13,25	sticking	6057:17,20,23	6068:10	suggested
6261:16	6100:2	6061:18	submission	6087:15
6273:15	Stiglitz	6068:6	6051:23	6095:23
statement	6135:6	strikes	6069:4,20	6102:15
6064:15	stipulate			
6067:21	6183:23			
6117:9				
6139:17,18				

6210:7,8	6178:24	6122:8	6211:4	6229:12,15
suggesting	6185:6	6136:3	switch	6256:14
6051:5	6193:18	6145:10	6094:12	6261:17
6081:23	6197:24	6152:19	switched	6290:21
6194:15	6198:1	6155:24	6286:18	6297:16
6212:16	6207:20	6157:9	switching	systems
6239:5	6212:10	6167:21	6070:23	6110:11
6242:4,7	6213:3	6184:19	6071:12	6119:8,16,
6244:9	6219:20	6190:15	6075:20	23 6124:16
6245:9	6220:18,20	6206:25	6076:25	6129:23
suggestion	,24,25	6207:11	6078:21	6156:20
6066:6	6221:17,24	6215:18	6079:13	6163:14
6215:2	6223:10,14	6216:21	6082:3	6164:15
6227:6	6224:14	6227:9	6087:2	6165:11
summarize	6225:6,7	6249:15	6094:1	6166:9
6105:9	6228:4	6258:12	6125:11,12	6194:24
summarizing	support	6264:19	6205:8,16	6195:25
6094:24	6065:4	6278:1	6206:9,13,	6196:6,8,1
summary	6129:18,23	6289:14	19,23	7 6256:5
6108:17	6142:4	6306:6,8	6207:13	
6115:4	6144:7	6310:21	6294:15	<hr/>
6116:6	6147:3	6311:8	6295:4,19	T
summed	6195:11	6317:4,15	synced	tab 6152:6
6125:25	6265:3	6319:2	6291:23	6162:9
summer	6272:11	surface	Synergy	6163:25
6119:24	supported	6048:1	6250:24	6165:2
6120:7	6164:22,25	surplus	6251:1,18	6166:7,10
6187:22	6178:20	6025:15,25	6254:7	6168:25
6188:17	supposed	6119:25	6256:4	6169:4,23
6189:17	6249:21	6209:25	system	6173:15,23
6199:13,14	Supreme	6212:13,18	6022:12,15	,24
summer-	6138:9,11	surprise	,18 6024:8	6175:19,21
peaking	sure	6281:12,14	6110:4,6,1	6176:12
6119:8	6023:15,25	surrender	1	6177:19
supplement	6024:3,12	6137:12,20	6119:3,20,	6178:15,16
6267:13	6026:19	,25 6138:4	21 6124:13	6179:14,15
supplemental	6028:12	surrendered	6128:7	,16 6180:2
6105:17	6029:16	6138:2,15	6130:20	6182:12
6113:17,22	6046:19	surrenders	6131:12	6186:6,8,1
6129:22	6047:10,16	6137:13,22	6153:1	0 6188:1
supplemented	,21 6051:5	susceptible	6154:6	6194:7,8
6082:12	6052:8	6094:21	6158:3,5,9	6196:24
supplied	6060:3	suspect	6159:25	6198:9,19
6187:9	6066:20	6039:9	6160:17	6207:25
supplies	6067:7	Sven 6015:3	6166:16	6215:25
6187:5	6082:16,23	Swanson	6169:15	6227:19
supply	6083:1	6208:22	6176:9,18	6229:19
6162:12,15	6090:24	6211:12,14	6182:20	6236:15
	6108:12	Swanson's	6195:15	6257:9
	6113:7		6196:5,11,	6264:12
	6114:12		18	6265:25
	6116:24			6281:21
				6283:18
				6284:8,9

6287:2	6297:18	6210:3	tends	6075:10
6290:4	6308:3		6215:16	6077:1,2
6294:4		tariff		6106:22
table 6016:1	talked	6024:5,10,	tens 6136:21	6110:10,18
6036:1	6026:5	17 6259:21	term 6168:9	,24
6038:2	6058:13	Tataskweyak	6169:8,17	6204:11,21
6058:6	6070:21	6135:22	6213:3	6243:10
6067:14	6078:9,20	6136:12	6309:15	
6092:22,25	6102:23	6141:14	6310:12	tested
6123:7	6106:6	6144:1		6067:5,8
6144:22	6110:25		termed	6072:6
6166:20,21	6111:23	Tchiakeesiks	6179:2	6111:8
,23	6127:25	6143:22	terminals	6207:6
6167:5,19	6154:25	team 6062:10	6256:9	testified
6180:3,9,2	6194:24	6266:15	terminating	6209:1,6
0 6181:15	6292:17	6268:11	6252:11	6260:10
6185:25	6303:17	6269:2	6253:3,8	6291:24
6186:4	6309:7	6319:3		6309:19
6199:25	talker	tec 6202:20	terminology	testify
6200:23,25	6120:23		6107:22	6029:23
6218:18	talking	technical	terms	6047:13
6222:6,11,	6020:4,5	6056:1	6020:12	6211:13,15
19 6224:14	6025:7	6060:24	6022:25	
6229:14	6035:25	6061:4,8	6038:24	testifying
6285:6,7	6049:11	6062:4	6047:1	6066:19
	6059:11	6063:10	6085:16	6067:11
tables	6073:6	6112:14,16	6105:2	
6068:3	6088:3,22	6247:24	6134:22	testimony
6080:14	6093:9	6250:19	6140:11	6027:3,10
6150:21	6110:1	6259:7	6142:3,5	6102:25
6289:15	6112:1	technically	6149:21	6208:22
	6116:5	6301:2	6155:25	6261:2
tactics	6138:23	technologies	6158:7	6262:22
6029:7	6140:5	6126:17	6161:19	
tailored	6141:4	6236:9	6181:7	testing
6110:5	6145:5	technology	6214:25	6032:10,13
taking	6155:1,19	6127:6	6215:7	6042:7
6082:16	6160:19	6287:6	6257:23	6043:8,10
6092:22	6192:19		6276:7	6052:9
6112:4	6198:14	teleconferen		6057:17,20
6147:8	6204:8	ces	Territories	,23 6061:1
6222:11	6207:12	6247:25	6136:15	6094:6
6290:10	6222:11	temporary	6137:2	6112:5
6317:10	6232:16	6146:16	territory	6209:4
talk 6029:18	6256:7,10	ten 6052:4	6136:14	6279:5
6046:23	6293:16	6083:9	6137:14	6300:21
6112:15	6296:12	6106:24	test 6026:7	tests 6068:7
6134:10,12	6299:3	6114:2	6044:14,19	6110:23
6142:22	6300:11	6214:13	6046:13	
6147:2	6310:1	6300:18	6061:18	Texas
6155:19		tend	6062:7	6237:19
6252:23	talks	6146:8,17	6067:3	6240:16
6292:13	6051:11		6074:11	text 6099:3
	tapping			6264:23

6306:10	6273:10	6096:22	6194:20	6284:9,16,
textbook	6274:2	6097:4	6196:24	22
6264:13	6276:2	6099:25	6197:7	6285:5,10,
6265:3	6283:19	6100:14	6198:9	17,24
thank 6023:7	6287:4	6103:13,23	6200:20	6287:11
6024:24	6289:23	6104:18	6201:24	6288:24
6036:11	6294:3	6106:14,15	6205:21,24	6290:2,8,2
6038:10	6296:10	6110:19	6207:3,4,1	0 6292:7
6040:1	6319:14	6112:22	5,16	6293:6
6042:1,3	thanks	6115:13	6211:2	6295:4
6048:24	6125:8	6116:3,8	6213:13,19	6296:9,10,
6060:20	6133:17	6118:5	6215:10	13,22
6061:5	6147:12	6119:7	6217:14	6297:12,21
6068:4	6254:3	6120:8	6219:24	6298:2,12,
6071:9	6284:7	6121:11,15	6220:7	17 6300:15
6072:14	that'll	,17	6221:17	6301:1,5
6075:4,5	6149:22	6123:12	6223:11,15	6302:2,6,1
6083:10	6317:12	6124:17	6224:13,18	9 6303:22
6086:1,14	that's	6125:5,24	,23	6304:1
6091:19	6022:2	6126:23	6225:6,14,	6305:9,16
6097:1,22	6025:4,17,	6127:13	18,22,24	6306:2
6100:6	21	6129:14,15	6226:13	6307:7,18
6102:17	6027:6,7	6131:1,17,	6229:17	6311:9
6108:20	6030:19	18 6132:13	6234:15,18	6313:4
6112:21,25	6034:6,13,	6137:8	,24	6314:20,25
6113:2,4,9	19,22	6138:10,12	6237:22	6315:22
6116:22,23	6036:6,10,	6141:8	6239:14	6319:6
6117:14	23	6143:10,19	6243:22	theirs
6118:19	6039:4,16,	6147:5	6244:22	6045:23
6124:18	18	6150:18	6245:18,19	theme 6125:2
6127:16	6040:6,9	6152:4	6246:2,15	themes
6129:25	6045:10	6155:4	6247:2	6075:9
6131:21,23	6046:2	6156:18	6251:6,15,	themselves
6132:14,18	6048:8	6161:14,22	23 6252:18	6168:24
,24 6145:7	6048:8	6168:8,9,1	6254:20	6278:20
6147:14	6051:3	1,25	6259:11	then-current
6148:2	6054:12,19	6169:9	6260:1	6099:23
6149:16	,21,22	6171:11	6262:16	therefore
6179:8	6056:15,16	6172:10	6264:13	6159:18
6192:6	6058:1,12	6173:1,8	6265:13,20	6172:5
6214:10	6059:9,10	6174:21	6266:4,7	6245:25
6249:12	6061:11	6175:1	6267:20	6292:23
6250:8	6065:2,13	6176:8,24	6269:14	6302:7
6252:7	6070:1	6177:19	6270:4,11,	there'll
6253:23	6071:10,18	6178:1,14	17 6271:13	6115:16
6255:16	6072:1,3,1	6179:7,16	6272:3	6156:15
6256:21	0,15,17	6181:1	6273:20	there's
6261:5	6077:13	6182:6,19	6274:21	6020:18
6263:9,10	6080:4	6184:18	6275:13,21	6029:9
6264:3	6083:22	6185:7	6276:16	6039:19
6265:25	6093:2,3	6186:2	6278:7,11	
6268:8	6095:12,14	6188:1	6279:14,23	
6269:19	,15	6191:24	6282:4,22	
		6192:15	6283:10	

6040:5	6286:6	6040:10	throughout	6147:24,25
6042:24	6289:19,21	6105:16	6053:19	tomorrow
6053:23	6291:2	6126:2	thus 6101:23	6159:6
6054:6,16,25	6297:14	6139:1	6208:21	6215:3,15
6055:1,3,19	6301:6,7,2	6168:17	6209:7	6316:12,14,17,19
6057:1,2,3	5 6302:4	6194:10	6293:25	6317:12,22,24
6058:10	6312:1	6205:18	tie 6238:25	6319:17
6060:6	6317:23	6217:5	tied 6158:3	tools
6063:6	6319:15	6253:17	6197:23	6267:13
6068:14	thermal	6308:4	6244:14	top 6034:15
6070:24	6156:22	thirteen	till 6027:16	6069:6
6072:19	6196:11,18	6238:11	timeframe	6140:8
6074:17	6203:2,25	6287:15	6215:1	6165:13
6075:25	they'll	thirty	timeline	6188:10
6079:24	6029:16	6095:22	6028:2	6199:7
6081:16	6158:2,9	6138:3	tired	6200:11
6082:18	they're	6225:22	6151:12	6216:9
6084:5	6018:15	6244:9	title 6135:9	6237:22
6088:23	6027:13	6316:10,24	6136:13	6240:9
6091:8	6036:2	6317:3,10,20	6138:20	6241:14
6092:12	6045:16	thirty-five	6264:18	6254:5
6096:12,19	6048:9,10	6268:1,6	titles	6266:19
6097:1	6052:18	6302:17	6134:23	6285:7
6100:8	6053:21	thirty-four	6135:18	6297:20
6108:22	6062:4	6243:20	6137:13,22	topic
6110:14	6081:15	thirty-three	today	6242:16
6112:23	6108:11	6278:25	6022:15	6247:7
6113:7	6117:12	thorough	6026:10	topics
6119:14	6129:20	6048:19	6033:11	6215:4
6121:5	6139:25	6060:23	6044:24	total 6137:6
6123:11	6140:2	thoughts	6047:18,19	6144:14
6129:8	6141:1	6021:7	6072:4	6162:21
6132:23	6146:13,14	6090:20	6102:23	6222:7,8
6136:25	6147:4	thousand	6106:2	6226:18
6144:10	6183:10,11	6079:9	6107:6	6228:6
6145:25	6214:8	6136:18	6117:13	totals
6154:20	6272:14	6180:8	6120:9	6274:19
6157:23	6319:5,7	6200:5	6123:13	touching
6160:11,12	they've	6201:14	6132:22	6094:13
6191:23	6033:13	6210:18	6133:14	tough 6316:3
6192:5	6047:25	6224:17,20	6141:14	tout 6142:19
6211:6	6048:5	6225:22	6153:6,18	toward
6213:17	6082:6	6226:16,22,25	6159:6	6053:11,17
6214:5	6130:23	6239:10	6290:22	6115:9
6229:21	6131:7	thre 6262:10	6311:7	towards
6231:15,16	6145:13	thread	6316:13	6115:17,23
6239:8	6150:22	6171:13	6317:7,10	
6240:9,22	6268:11		6319:16	
6261:7	thinner		today's	
6274:4	6150:18			
6277:7,9,10	third			
6283:22				

6318:16	transferring	6258:1,8,1	6136:2,5,1	6114:11
6319:10	6078:24	6	1,19,20,23	6115:14
toys 6143:4	translate	6259:15,20	6137:2,4,1	6117:8
track	6032:10	,22	0,25	6122:18
6075:12	6170:25	6260:20	6138:18	6153:22
tracking	6270:8	6261:3	6139:6,9,1	6160:3
6245:19	6274:17	6295:7	5,19	6171:12
tradition	translates	transmission	6140:9	6172:18,20
6138:10	6141:23	s 6235:17	trend	6199:23
traditional	translation	transparency	6053:11,17	6218:12
6136:13	6275:3	6110:7	6057:12	6280:8
traffic	transmission	6111:22	tried	6297:14
6023:10	6022:1	transpired	6055:21	6316:21
trailer	6023:9,19,	6133:24	6057:3	turbine
6270:21,22	24 6024:2	transportati	6062:7	6070:1
trailers	6043:4	on 6239:19	6065:21	turbines
6141:23,24	6049:12	trap	6084:23	6069:24
training	6052:6	6143:20,22	6293:6	6202:20
6146:5	6073:12,15	,23,24,25	trouble	6312:12
trans 6093:8	6074:21	6144:11	6147:9	turn 6018:7
6309:12	6077:23,24	travel	6239:8	6028:13
transaction	6087:14,20	6089:25	troubling	6033:25
6170:6	6088:14	6142:19	6182:19	6092:4
transactions	6089:2,6,1	travelled	true 6297:13	6105:12
6120:2	5,23	6144:3	truncated	6113:5
transcript	6091:12	travelling	6270:2	6141:8
6016:24	6092:9	6023:21	try 6022:20	6147:25
6064:9	6093:21	treading	6038:19	6152:3,6,2
6152:20	6099:14	6190:21	6046:10	2 6162:8
6209:13	6106:25	treat 6206:8	6047:17	6165:2
6211:25	6107:2	treated	6057:14	6166:7
6289:6,24	6118:3,15	6024:15	6062:10,14	6169:4,23
6313:9	6119:6	6054:19	6066:14	6178:11
6317:8	6120:15	6146:14	6075:12	6180:2
transcripts	6121:5	6274:9	6088:4	6188:1
6091:4	6129:12,17	treaties	6105:9	6196:24
transfer	6151:8	6136:16	6128:21	6199:4
6101:5,15,	6156:4	6137:11,15	6158:17	6207:25
24 6123:11	6160:17	,16	6170:24	6222:13
6154:9	6162:18	treatment	6171:25	6228:2
6156:16,20	6208:3,7	6020:24	6215:10	6229:18
6157:3	6209:18	6101:4	6223:7,9	6231:3
6188:21	6213:17	6166:2	6232:23	6236:16
6189:10,19	6214:5	treaty	6270:14	6237:3
6195:16	6219:3	6134:9	6302:11	6243:7
6254:16	6229:12,15	6135:18,24	trying	6255:10
6260:15	6233:25	,25	6055:23	6264:1
	6234:3,6		6057:21	6266:18
	6235:14,25		6088:5,12	6273:25
	6250:1,20		6097:2	6276:3
	6251:11,19			6301:19
	6254:11			6304:19

turning 6151:9 6270:12 6273:14 6289:24 6296:24	twenty-three 6238:12	uncertain 6054:12,20	6121:18,20 6122:18 6157:12 6164:20 6205:6 6206:16 6213:23 6215:2 6234:5 6243:10 6251:9 6252:8 6259:8 6261:2 6263:1,4 6285:25 6291:13 6293:13 6305:21 6312:25	6232:24 6234:4 6251:7,16, 18 6262:1 6267:18 6295:22 6311:6 6318:17
turns 6073:23	twice 6264:18	uncertainty 6031:9 6043:3 6044:23 6045:18 6046:17,20 6047:8,12, 22 6048:13,20 6049:10 6054:21 6058:15 6060:3,16 6066:23 6084:5 6094:22 6108:23 6284:10,25 6285:1 6288:11 6306:21 6307:1,5,8	6206:16 6213:23 6215:2 6234:5 6243:10 6251:9 6252:8 6259:8 6261:2 6263:1,4 6285:25 6291:13 6293:13 6305:21 6312:25	6311:6 6318:17
twelve 6018:15,17 6174:10 6277:4 6280:22	two-thirds 6172:22	underlie 6276:19	6234:5 6243:10 6251:9 6252:8 6259:8 6261:2 6263:1,4 6285:25 6291:13 6293:13 6305:21 6312:25	understands 6207:11
twenty 6095:21 6096:6,21 6117:5,6 6132:21 6201:2 6230:22 6231:16 6249:22 6250:2 6252:16 6278:4	type 6032:8 6121:11 6193:25 6274:23 6275:11,18 6290:3	underlying 6060:9,12	6234:5 6243:10 6251:9 6252:8 6259:8 6261:2 6263:1,4 6285:25 6291:13 6293:13 6305:21 6312:25	understood 6033:24 6045:24 6059:13 6066:18 6087:24 6096:25 6116:25 6204:9 6209:15
twenty-five 6180:8 6200:4 6201:4,5,1 3	typical 6024:6 6275:11	underneath 6188:15	6234:5 6243:10 6251:9 6252:8 6259:8 6261:2 6263:1,4 6285:25 6291:13 6293:13 6305:21 6312:25	undertake 6149:2
twenty-four 6159:7 6201:17 6219:3 6229:8 6230:6,16 6231:5 6233:16,23 6235:23 6238:9	typically 6111:5 6275:6,11	underscore 6141:16	6234:5 6243:10 6251:9 6252:8 6259:8 6261:2 6263:1,4 6285:25 6291:13 6293:13 6305:21 6312:25	undertaken 6145:13 6248:14 6279:18
twenty-one 6231:7 6232:6	typo 6191:24 6192:5	understand 6026:9 6031:3 6034:1 6047:16,22 6051:24 6053:10,11 6055:11 6076:9 6084:4 6086:17 6090:24 6091:25 6092:24 6118:25	6234:5 6243:10 6251:9 6252:8 6259:8 6261:2 6263:1,4 6285:25 6291:13 6293:13 6305:21 6312:25	undertaking 6017:16 6037:25 6038:6 6080:22 6082:8,15, 19 6087:14 6148:11,17 6149:1,3,1 5
twenty-seven 6080:15,16 6081:9 6085:10,16 6086:12 6288:21 6306:25	Ukrainian 6249:17	underscore 6141:16	6234:5 6243:10 6251:9 6252:8 6259:8 6261:2 6263:1,4 6285:25 6291:13 6293:13 6305:21 6312:25	undertakings 6148:9
	ultimate 6054:7 6106:15	understand 6026:9 6031:3 6034:1 6047:16,22 6051:24 6053:10,11 6055:11 6076:9 6084:4 6086:17 6090:24 6091:25 6092:24 6118:25	6234:5 6243:10 6251:9 6252:8 6259:8 6261:2 6263:1,4 6285:25 6291:13 6293:13 6305:21 6312:25	undertook 6270:1 6279:22
	ultimately 6067:12 6106:14 6108:6 6205:4	underneath 6188:15	6234:5 6243:10 6251:9 6252:8 6259:8 6261:2 6263:1,4 6285:25 6291:13 6293:13 6305:21 6312:25	unexpected 6042:17
	unattractive 6028:16	underscore 6141:16	6234:5 6243:10 6251:9 6252:8 6259:8 6261:2 6263:1,4 6285:25 6291:13 6293:13 6305:21 6312:25	unfilled 6134:8 6135:9,17
	unavailabili ty 6197:23	understand 6026:9 6031:3 6034:1 6047:16,22 6051:24 6053:10,11 6055:11 6076:9 6084:4 6086:17 6090:24 6091:25 6092:24 6118:25	6234:5 6243:10 6251:9 6252:8 6259:8 6261:2 6263:1,4 6285:25 6291:13 6293:13 6305:21 6312:25	Unfortunatel y 6248:22 6263:5

unhappy 6146:7	6318:20 6319:10	6265:19	validity 6097:21	variability 6084:20,21 6085:1,18, 21 6086:11 6185:3
unique 6065:3,11 6110:3 6131:14 6186:20 6193:25 6194:12,18 ,20 6195:1,19 6196:2,4,7 ,8,16,17	updated 6020:15 6028:19 6030:3 6033:16 6036:9,11 6038:3 6048:11,19 6050:14,16 ,25 6051:12,16 ,22 6058:14 6060:8,12 6062:5 6098:3 6101:3 6114:18 6231:7 6232:12,13 6307:20	upper 6021:2 uprising 6141:14 upstair 6247:6 upward 6220:1,7 6246:13 upwards 6246:8 urge 6144:20 useful 6059:15 6083:7 6149:12 6272:3 users 6259:15 utilities 6014:3,21 6096:13 6131:20 6165:16 6166:1 6167:21,23 6168:3 6183:21 6194:17 6232:1 6266:2 utility 6104:23,24 6110:16 6131:7 6158:25 6171:4 6269:21 6290:18 utilize 6152:25 6162:18 utilizing 6086:25 <hr/> V <hr/> val 6039:11	valuation 6266:1 6267:5 valuations 6266:3 value 6032:4 6034:21,25 6035:12,22 6036:4,16, 25 6037:3 6039:3,11 6058:10,11 6073:19 6074:6,21 6076:9 6103:25 6104:1,6 6107:1 6123:25 6136:14,22 6140:12 6146:3 6204:12 6265:4,8,1 0 6266:21 6267:4,13, 18 6268:2 6269:18 6270:15 6271:1,2,8 ,9,11 6273:7 6277:15 6288:25 6289:7,25 6290:23 6292:1,13, 16,25 6301:8,9 6313:10 valued 6140:23 values 6034:11 6270:2 6290:4 Van 6015:8 6247:10 6268:21	variable 6085:15 variant 6071:3 variation 6285:12 6286:21 6287:9 6291:6,8 varies 6285:19 6287:12 6291:17 6293:2 various 6088:23 6089:2 6100:8 6216:4 6248:7 6251:3 6252:15 6259:16 6290:11 6301:21 vary 6080:24 6115:7,16, 18 6256:24 vehicle 6023:20 ventures 6146:25 ver 6097:13 verification 6233:17 verify 6252:5 vernacular 6107:13 vers 6085:10 version 6110:22 6122:7
unit 6202:8,21 6203:25 United 6240:4,6 units 6069:23 6141:23 6165:22 6202:25 6203:2 universe 6067:15 6195:25 unknown 6124:4 unless 6050:13 6139:25 unleveraged 6274:3 6275:4 unlikely 6097:13 unreasonable 6112:19 unsurrendore d 6136:13 update 6017:18 6020:20,22 6050:4 6051:6 6052:24 6149:21,25	updates 6033:14 6048:21 6049:21 updating 6032:13 6058:21 6131:8 upgrade 6025:21 upgrades 6170:5 6260:11 upon 6018:1 6023:16 6024:20 6028:8 6083:12,13 6094:13 6113:24 6133:3,4 6147:20,21 6174:24 6178:18,25 6212:25 6214:16,17 6234:18 6263:21,22			

6171:1	6031:12	6205:4	6254:21	6180:4
versions	views	wasn't	we'd 6018:3	6184:19
6026:7	6029:24	6036:13	6077:3	6222:3
versus	6046:6	6069:24	6228:3	6223:5
6035:20	6068:8	6102:9	6308:21	6238:14
6047:19	6104:6	6104:15	6309:7,16	6243:5
6065:2	vintage	6145:18	week 6120:23	6249:3
6085:3	6307:8	6172:18	6255:20	6297:17
6167:4	visually	6183:23	6267:11	6316:11
6242:9	6296:11	6193:4	6306:19	6319:16
6289:4	volume	6209:3	6318:17	we're
6290:18	volume	6211:12	6319:10	6021:22
6292:25	6017:19,21	6236:1	weekends	6025:7
6303:12	,22,23	6277:17	6318:22	6027:8,9
vertical	6035:2	6280:7	weight	6033:17
6284:14	6150:3,7,9	wasted	6067:12	6035:25
6286:20	,11,13,15,	6268:6	6095:13	6042:14
vet 6133:21	18,21	watch 6247:6	6096:8	6044:2
vetted	6151:1,5	water	6273:17,22	6055:8
6077:21	6152:4	6022:14	weighted	6058:24
viable	6178:18	6026:1	6094:25	6060:1,8,1
6297:7	6257:9	6111:8,13	weighting	5 6067:16
view 6028:23	6264:10	6124:9	6051:15,21	6071:15
6030:12	6283:18	6138:1,4,1	6052:5,10,	6074:13
6033:11,12	vous 6018:8	4,17	11	6076:15
6034:10	<hr/>	6155:18	weights	6078:1
6047:8	wait 6027:18	6162:15	6033:22	6079:16
6057:5	6318:6	6166:5	Weinstein	6082:16
6095:20	waiting	6169:16	6015:25	6083:15
6098:2,10	6040:2,3	6170:17	weird	6084:14
6099:15,19	walk 6167:2	6176:3	6042:16	6092:8,15
6102:2	6168:12	6181:8	welcome	6093:2,9
6104:19	6169:4	6197:24	6133:8,14	6094:5
6108:3	6180:4	6198:6	6249:9	6103:1
6127:19	6193:21	6244:3,4,1	6264:2	6108:1
6129:3	6222:6,21	4,17,18,24	we'll	6109:1
6130:8	6287:6	waters	6026:14	6113:5
6164:23	walked	6137:23	6027:15	6116:4
6215:12	6185:17	6138:1	6038:5	6126:22
6257:1	6193:24	ways 6065:24	6043:11	6134:14
6260:19	walking	6304:18	6082:12,14	6140:5
6262:18	6190:9	weather	6132:8,19	6141:4
6291:2	Waneta	6156:21	6147:17	6142:8
6308:11	6170:5	6161:12	6151:9	6144:2,8,1
6309:3	warm 6199:9	6199:2	6167:2	9 6145:6
viewed	6200:19	6200:1,14	6168:8,12,	6147:16,24
6075:17	6201:1,8	6239:23	13 6169:4	6152:8
6150:23	warrant	website	6173:12	6154:10,12
viewpoints		6232:2	6176:22	6155:1,16,
				18,19
				6157:9,14,
				15 6164:5
				6165:16

6167:21	6096:1	whether	6057:24	6241:9
6169:24	6098:22	6022:21	6082:1	6250:24
6183:4,19	6102:22	6024:21	6133:23	6251:1,13,
6198:18	6106:4,6	6026:15	6136:13	18 6254:6
6200:3,25	6107:23	6027:19	who's	6256:4
6201:12	6110:15,25	6038:1	6134:25	Wind/Gas
6207:12	6111:12	6042:6,14	6135:6	6069:2
6215:2,17	6113:21	6043:21	6146:22	6070:5
6225:5	6125:10	6044:2	who've	6071:3
6227:7,15,	6127:25	6045:17,18	6135:8	6126:25
18 6241:21	6130:6	6046:1,7	6248:14	6234:14,20
6246:14	6145:4	6048:8,9,2	wide 6048:3	window
6250:7	6148:5	3 6050:15	6061:11	6260:19,24
6263:1	6151:22	6052:1,2	widely	Winnipeg
6301:11	6166:18	6058:9,10	6135:22	6014:23
6310:1,21	6173:19	6061:10	wider	winter
6311:16	6174:23	6066:1	6081:22	6119:10
6316:20,21	6177:5	6067:18	William	6120:5,14
6318:16	6180:4	6074:12	6015:13	6121:4
6319:16	6181:24	6079:19	Williams	6187:15
west 6212:8	6182:6	6081:17	6015:11	6199:8,10
Westerfield	6184:5	6084:19	6097:23	6200:1,14
6264:15	6186:24	6086:19	6105:14	6201:8,9
western	6190:22	6091:9	6124:21	6203:25
6137:17	6193:24	6096:13	6149:4	6217:19
6253:7	6194:2	6100:9	6318:4,5,1	6295:6
we've 6021:7	6214:12	6101:11,15	4,15	winter-peak
6022:6,8	6242:18	6105:3	6319:2,9	6119:21
6026:5,7	6296:17	6108:3	willing	winter-
6029:8,23	6304:7	6155:17	6233:20	peaking
6036:9	6307:7,13	6207:3	wind	6119:3
6044:19	Wha 6255:5	6209:10	6071:4,6	winters
6046:7,23	whatever	6222:21,22	6106:5	6199:19
6049:11	6067:12	6265:18	6124:20	Wisconsin
6050:2,25	6155:22	6269:5	6126:3,6,1	6260:14,21
6052:3	6207:4	6272:23	0	wise 6317:6
6059:23	Whatever's	6273:1,4	6127:7,12,	wish
6060:17	6081:25	6283:12	19	6146:3,4
6061:9,10,	whenever	6288:3,4	6128:20,25	6207:25
16,21	6228:24	6291:9,10,	6129:5,14,	witness
6070:12,21	whereas	11	19 6229:24	6264:22
6072:10	6021:3	6293:5,17	6230:5	6307:17
6076:20	6183:11	6309:24	6232:14	witnesses
6077:9,10	whereby	6310:11	6233:2,10	6091:24
6078:10,11	6259:22	6312:6	6235:7	6098:16
6083:22	6286:17	6316:16	6236:8	6099:4
6084:8	where's	6318:1	6237:8	6103:14
6086:16	6226:21	whistling	6239:12	6117:19
6090:18	wherever	6145:7	6240:5,10,	
6091:2,4	6136:25	white 6095:5	16,18	
6093:8		whole		
6094:23		6056:19		

6262:23	6201:10	6136:19	6204:10	zero 6038:17
Wojc 6149:5	6204:22	6137:6	6229:20	6040:10,15
Wojczynski	6247:17,21	6140:1,22	6284:8	6188:17
6148:22	6268:9	6260:11	6296:8	6276:5,25
6149:2,9,1	6269:6	6273:9	6297:3	6277:6,10
1,12	6281:19,25	worthwhile	yet 6059:12	6278:9
6296:7	6300:2,7	6029:4	6074:4	6280:12
Wojczynski's	6305:7	would've	6102:1	6281:13,15
6148:21	6318:13	6068:2	6233:21	6310:3
6149:5	6319:8	WPS 6021:3,4	6260:22	zeroes
woman	worked	6027:1	6271:1	6285:16
6146:21	6136:15	6037:5	6317:14	6287:9
women	6233:15	write	you'll	6289:19
6138:16,17	workforce	6282:17	6081:22	zero-five
6147:3	6146:9	writing	6168:16	6103:21
wonder	working	6282:12	6169:13	6104:20
6018:5	6102:24	written	6230:11	zeros
6138:2	6167:21	6140:2	6237:23	6285:13
6316:15,16	6201:7	wrong	younger	
,18	6268:23	6035:7,12	6149:13	
wondered	6269:2	6053:16	yours	
6301:3	works	6093:11	6230:11	
wonderful	6074:15	6166:16	yourself	
6073:24	6077:4	6189:7	6089:4	
wondering	6263:1	6280:8	you've	
6089:3	6310:24	6283:4	6030:17	
6109:7	workshops	wrote	6034:8	
6152:24	6151:24	6133:24	6036:14,18	
6316:4	world	Wuskwatim	6037:1	
work 6031:20	6112:15	6146:2,5	6045:14	
6045:21	6135:1,7	Wyoming	6057:14	
6046:12	worried	6237:18	6059:6,8	
6056:6	6065:10		6066:6	
6062:9	6270:25		6078:20	
6065:13,15	6271:17		6090:21	
,17,20	worry 6059:6	XX-4 6035:2	6095:23	
6067:24	worse		6110:12	
6075:22	6059:20		6146:16	
6076:17	6141:18		6164:17	
6082:2	6142:25		6177:12	
6087:8,14	6143:15	year-by-year	6182:13	
6089:9	6204:1	6269:22	6183:13	
6091:15	6302:14,23	yesterday	6208:20	
6093:4	worst	6020:4,23	6209:7	
6102:9	6184:20	6065:1	6216:8	
6103:1	worth	6090:10	6254:5	
6111:20	6039:22	6093:25	6276:4	
6135:3	6074:12	6096:9	6286:4	
6151:5		6107:13	6293:14	
		6124:19		
		6152:17		
			Z	