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2 ALBERTA UTILITIES COMMISSION

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7 Application No. 29377-A001, 29377-A002

8 Proceeding ID No. 29377

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11 OYEN WIND POWER PROJECT

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17 PROCEEDINGS

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21 Volume 2

22 June 10, 2025

23 Held via videoconferencing

24 Calgary, Alberta

25

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1 with you how you would like me to proceed with

2 interpretation. I'm hired for consecutive

3 interpretation.

4 Am I interpreting everything into German for

5 Dr. Bellut, or am I only interpreting what she is

6 saying in German into English, or how would you like me

7 to work today?

8 THE CHAIR: So it's an excellent question. Go

9 ahead. Is it Dr. -- it's Dr. Bellut; is that right?

10 Did you -- I saw you raised your hand.

11 DR. BELLUT-STAECK: Yes. I have a suggestion that if

12 I feel able to make the report in English, I can do

13 that, especially in the introduction, in the findings,

14 in the response, but if I need the interpreter, I would

15 like to make a sign, and I think for the

16 cross-examination, I will use the interpreter for whole

17 the session, then, if that's okay.

18 THE CHAIR: That makes sense. So just so that

19 we understand, then, so for your direct evidence,

20 unless you need the interpreter, your plan is to go

21 forward and do that in English, and then during the

22 cross-examination, you will use the interpreter?

23 DR. BELLUT-STAECK: Yes.

24 THE CHAIR: Okay. I think that's fine.

25 THE INTERPRETER: Thank you. Understood. Okay. So

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1 Proceedings taken at the Alberta Utilities Commission via

2 videoconference.

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4 Volume 2

5 June 10, 2025

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|                                 |                           |
|---------------------------------|---------------------------|
| 7 Cairns Price                  | Chair                     |
| 8 Vera Slawinski                | Commission Member         |
| 9 Jaimie Graham                 | Commission Counsel        |
| 10 Sophie Jiang                 | Commission Staff          |
| 11 Oluwafunke Adebayo           | Commission Staff          |
| 12 Terri-Lee Oleniuk            |                           |
| 13 Elyse Bouey                  | For RES Oyen Wind LP      |
| 14 Ifeoma Okoye                 |                           |
| 15 Chinedu Kema                 | For Oyen Landowners Group |
| 16 Joanne Lawrence, RPR, CSR(A) |                           |
| 17 Diana Halvorsen, RPR, CSR(A) | Official Court Reporters  |

18 \_\_\_\_\_

19 (PROCEEDINGS COMMENCED AT 9:00 A.M.)

20 THE CHAIR: Good morning. I believe we have

21 everyone here. So welcome to day 2 of part 1 of the

22 Oyen wind power project hearing. And today, we have

23 the expert witness panel for the OLG, and so we'll

24 begin with -- well, first I'll ask if there are any

25 preliminary matters before we begin this morning.

I see a hand is raised there by the -- oh, no.

THE INTERPRETER: Yes, I am the interpreter who was

hired for today, and I really just wanted to check in

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1 I will be ready to jump in if you need my help. Okay.

2 THE CHAIR: Okay. Perfect. And then your

3 counsel, your lawyers, will also be of assistance. So

4 I'll turn it over to them to begin the direct.

5 Actually, first you'll need to be sworn in. But

6 I'll turn it over to counsel for the OLG.

7 MS. OKOYE: Yes, good morning, Chair Price. I

8 was just going to clarify how that was going to work.

9 But thank you for getting that clarified.

10 So this morning, we have for the OLG expert panel,

11 we've got Cliff Wallis, James Farquharson, Chris

12 Tenszen, and Dr. Ursula Bellut-Staack. I will handle

13 the direct for all of the expert witnesses except

14 Dr. Ursula Bellut-Staack. That will be handled by my

15 colleague, Chinedu Kema. So if Madam Court Reporter

16 could swear or affirm the witnesses.

17

18 **C. EICHBAUER, affirmed as interpreter in the German**

19 **language**

20

21 **C. WALLIS, J. FARQUHARSON, R. BARCLAY, U. BELLUT-STAECK,**

22 **C. TENSZEN (For Oyen Landowners Group), sworn/affirmed**

23 **MS. OKOYE EXAMINES THE PANEL:**

24 Q. So starting first with Mr. Cliff Wallis. Chair Price,

25 Mr. Cliff Wallis is well known to the Commission, so I

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1 won't say much about introducing him.  
 2 Mr. Wallis's affidavit adopting his report and CV  
 3 has been filed as Exhibit 122.  
 4 Ms. Adebayo, if you could please pull up  
 5 Mr. Wallis's opening statement, Exhibit 141, and once  
 6 that is up, Mr. Wallis, you can proceed.  
 7 A. MR. WALLIS: All right. Good morning, Chair  
 8 Price, Commissioner Slawinski, AUC staff and all  
 9 participants at this hearing. Could we go to the next  
 10 slide, please, Ms. Adebayo?  
 11 The project will be located in the dry mixedgrass  
 12 natural subregion, which was a part of the Northern  
 13 Great Plains and a global priority for conservation.  
 14 There are 84 infringements of wetlands setbacks from  
 15 the rotor-swept areas 53 turbines and some wetlands are  
 16 under the rotor-swept areas.  
 17 The air prints impact on birds has not been fully  
 18 explored or mitigated. ADEPA thinks the project poses a  
 19 high risk to wetland habitats and amphibians, which is  
 20 only partially mitigated. Of 27 project area bird  
 21 species that have experienced large population declines  
 22 since 1970, over one-third have recorded mortalities at  
 23 Alberta wind projects in eastern Alberta. The  
 24 pronghorn migration area was also not dealt with by  
 25 RES.

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1 Next slide, please, Ms. Adebayo. I make several  
 2 recommendations if the project is approved: Use the  
 3 prescribed wetlands setbacks, lay the groundwork for  
 4 cumulative effects work, start exploring the potential  
 5 of radar to reduce bird mortality, have a mitigation  
 6 framework that is effective for birds, develop a  
 7 protocol for snakes and extend the duration of the  
 8 monitoring program.  
 9 Thank you. That concludes my opening statement.  
 10 Q. So, Mr. Wallis, have you had an opportunity to listen  
 11 in or review the transcripts of the proceedings to  
 12 date, especially as it relates to the cross-examination  
 13 of Ms. Sare on environmental and biodiversity impacts?  
 14 A. MR. WALLIS: Yes, I have a few points to make  
 15 and I'll confine my remarks to what I heard in  
 16 testimony.  
 17 Q. Okay, please proceed.  
 18 A. MR. WALLIS: Regarding pronghorn, on transcript  
 19 page 53, Ms. Sare says they followed the requirements  
 20 of the directive. Despite what is actually required in  
 21 the wildlife directive about sensitive and migratory  
 22 wildlife, Ms. Sare indicated on transcript page 52 that  
 23 they had not used the 2013 sensitive species inventory  
 24 guidelines for pronghorn, nor indeed any protocols.  
 25 On transcript page 53, Ms. Sare indicated their

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1 pronghorn information consists of only incidental  
 2 observations. This is a species that she agrees is  
 3 provincially listed as sensitive. There have been at  
 4 least two AUC hearings, Aira solar and the Wild Rose 2  
 5 amendment, where the subject of pronghorn and renewable  
 6 energy project impacts has been discussed extensively.  
 7 I was surprised that Ms. Sare was not even aware  
 8 of Jakes' seminal work on pronghorn. After the Gates  
 9 paper and Jakes' work on pronghorn migration through  
 10 that area -- that's the Wild Rose 2 area -- were  
 11 published, Ms. Sare was project manager and wildlife  
 12 lead on an earlier incarnation of that project.  
 13 On transcript page 54, Ms. Sare agreed that they  
 14 used cultivated landscapes, that is pronghorn, but  
 15 prefer native ones. The observations provided in the  
 16 undertaking show that cultivation is indeed used. They  
 17 cross open cultivated areas where there is sometimes  
 18 fewer fences that would otherwise create barriers to  
 19 movement in order to get to their more favoured  
 20 habitat. They will also preferentially use cultivated  
 21 areas at certain times of year if there is reduced snow  
 22 cover and early green-up.  
 23 While Ms. Sare acknowledged on transcript pages 56  
 24 and 57 that pronghorn have behavioural shifts related  
 25 to wind facilities, she characterized them as slight

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1 and that they do not result in lowered survival.  
 2 In the only paper that deals with the subject and  
 3 discussed in my report, one should not characterize the  
 4 situation that way. Milligan 2022 says that while wind  
 5 projects are not a barrier to migration, pronghorn make  
 6 important behavioural adjustments, particularly during  
 7 the spring migration that likely reduce the functional  
 8 benefits of their seasonal migrations, which is a  
 9 critical time for individuals to access food to support  
 10 birthing.  
 11 In his 2021 paper, Milligan indicated that the  
 12 accumulation of development, including wind turbines,  
 13 roads, and fences can both limit movement and fragment  
 14 habitat potentially reaching a critical threshold,  
 15 beyond which populations are negatively impacted.  
 16 Turning to wetlands, on page 59 of transcript,  
 17 Ms. Sare acknowledges that eight turbines will overlap  
 18 seasonal or higher permanence wet lands and also that  
 19 such wetlands are very important habitats for migrating  
 20 and breeding birds. She then goes on to downplay the  
 21 significance by saying only a small amount of wetland  
 22 is impacted.  
 23 6.7 hectares of wetlands and waterbodies are  
 24 affected by the air print, and she notes on page 60 of  
 25 transcript an additional 2.38 hectares of footprint if

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1 you include all the drainages, waterbodies, and  
2 wetlands.

3 The concern is that these habitats support a  
4 diversity of birds at different times of the year, and  
5 the rotor-swept area will be directly above these  
6 areas. This adds to the concerns that many turbines  
7 have relaxed setbacks. I can see why AEPa thinks  
8 things are only partially mitigated. The directive  
9 setbacks are meant to deal with all the potential risks  
10 from such developments.

11 On page 68 of transcript, Ms. Sare acknowledges  
12 the benefits of siting projects away from productive  
13 wildlife habitats, and she indicates that RES went to  
14 great lengths to site turbines outside of the setbacks,  
15 including the rotor-swept area. That does not reflect  
16 the truth about the project's airprint. As I note in  
17 my report, there are 84 infringements of Class 3 and  
18 higher wetland setbacks from 53 of the turbines'  
19 rotor-swept areas.

20 As a bit of an aside, I thought that  
21 Mr. Cuthbert's observation on AEPa's referral report  
22 was interesting on page 191 of transcript, when he  
23 acknowledged AEPa's elevated ranking of high risk for  
24 wetlands, but still they gave it an overall low risk  
25 rating for the project.

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1 It's easy to see how regulators like the AUC will  
2 now get presented with misleading information from  
3 AEPa. They've gone from providing more insightful,  
4 multi-subject, multipage referral reports and has now  
5 brought all that information down into one page,  
6 one-size-fits-all ranking of risk. Even though you may  
7 have significant concerns in one area like wetland  
8 which is can now get masked in the iteration of  
9 referral reports. At least in this one, we can see it.

10 Turning to radar and nocturnal migration and its  
11 potential, at transcript page 63, Ms. Sare uses the  
12 context and policy in Alberta and the relatively small  
13 part that wind turbines play in bird mortality as  
14 reasons why she doesn't believe that radar work would  
15 be a useful addition. In my professional opinion, all  
16 mortalities of declining species are a problem, even if  
17 wind energy is not yet the most important factor.

18 At transcript page 65, Ms. Sare agrees that within  
19 Canada, the estimated bird fatalities at wind  
20 facilities are in the hundreds of thousands of birds a  
21 year, with even larger amounts in the U.S. It is  
22 troubling that we don't seem to be concerned enough  
23 about this to more actively pursue innovative  
24 technologies like radar.

25 As noted in any report, the Canadian Wildlife

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1 Service has considered use of radar important enough to  
2 require it, given the increasing heights of turbines  
3 that reach into the nocturnal flight corridor of  
4 songbirds. Radar is being used for identifying both  
5 local bird movements as well as over the whole  
6 continent.

7 And lastly, on regional impacts or regional  
8 cumulative impacts, on page 71 of transcript, it was  
9 good to see Ms. Sare follow in the footsteps of other  
10 projects and not be opposed to cumulative effects work.  
11 It would certainly help all of us. And that concludes  
12 my going over the cross.

13 Q. Thank you, Mr. Wallis.

14 So we now go over to Dr. Robert Barclay. Same,  
15 Dr. Barclay is known to the panel, so I will not go  
16 into a description -- or, yeah, an introduction.

17 Dr. Barclay's affidavit adopting his report, his  
18 CV and his response -- and his information response has  
19 been filed as Exhibit 124.

20 Ms. Adebayo, could you please pull up  
21 Dr. Barclay's opening statement? And once that is on,  
22 Dr. Barclay, you can proceed.

23 A. DR. BARCLAY: Thank you very much. I was asked  
24 to address the risk to bats posed by the proposed Oyen  
25 wind facility. Next slide, please.

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1 And you might ask why bats. Both bats and birds  
2 are killed by wind turbines, and in Alberta and across  
3 North America, the number of bats killed is generally  
4 greater than the number of birds, but more importantly,  
5 the number of bats killed per species is far greater  
6 than the number of birds killed per species. Estimates  
7 are in the hundreds of thousands of bats killed per  
8 year by turbines across North America.

9 Next slide, please. Of the nine species of bats  
10 we have here in Alberta, three migratory species make  
11 up the majority of fatalities. These are the hoary  
12 bat, silver-haired bat and eastern red bat. All three  
13 occur across North America, and they're listed as  
14 sensitive in Alberta and have been recommended to be  
15 listed as endangered in Canada by the committee on the  
16 status of endangered wildlife in Canada.

17 Another species, the little brown bat, down in the  
18 lower right, is also killed, and it is listed as  
19 endangered in Canada. All of these are insect-eating  
20 species of bats, and they contribute to the consumption  
21 of many species of agricultural pests.

22 Next slide, please. Like all bats, these species  
23 are unusual small mammals in that they have a slow life  
24 history, by which I mean they can live long lives, up  
25 to 30 years or more, and they have slow reproductive

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1 rates, typically one or two young per year, and what  
 2 this means is that if the populations decline, they are  
 3 slow to recover, if recovery is possible.  
 4 Next slide, please. Bats are killed at turbines  
 5 via two ways. First of all, they can be hit by the  
 6 spinning blades, but they can also be killed by what's  
 7 called barotrauma. They fly through a zone of low air  
 8 pressure that surrounds the spinning blades, and that  
 9 causes their lungs to suddenly expand, causing internal  
 10 injuries. Birds have a very different respiratory  
 11 system and are not impacted by barotrauma.  
 12 Next slide, please. Evidence indicates that  
 13 populations of the three migratory species of bats are  
 14 declining. Here are some data from Ontario indicating  
 15 a drop in populations of the three species. Modelling  
 16 estimates -- modelling estimates a 50 percent decline  
 17 in hoary bat population across North America in the  
 18 next decade or so, even with low build-out of wind  
 19 energy facilities.  
 20 Next slide, please. When bats are killed is very  
 21 important in terms of how we might mitigate. The  
 22 migratory species are killed primarily during fall  
 23 migration. In Alberta, that's August and early  
 24 September. They're night flyers, so they're only  
 25 killed at night, and they're killed especially when

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1 it's warm, when it's not raining, and the wind is  
 2 light. And this all opens up ways to gain the benefits  
 3 of wind energy but reduce bat fatalities.  
 4 Next slide, please. The main method to reduce bat  
 5 fatalities is called blanket operational curtailment.  
 6 Essentially increase the cut-in wind speed, the wind  
 7 speed at which the blades start spinning at night,  
 8 during fall migration, and when the wind speed is low.  
 9 And doing that, this paper that I'm citing here, the  
 10 average reduction in bat fatalities is 63 percent. And  
 11 the cost in terms of energy production is low. It's  
 12 less than 2 percent.  
 13 Next slide, please. There are other methods that  
 14 have been developed more recently to reduce bat  
 15 fatalities, what's called smart curtailment in which  
 16 you simply include more than just wind speed in terms  
 17 of when the curtailment occurs. So only when it's  
 18 warm, only when it's not raining. And that means there  
 19 is less energy loss, and the study by Hayes in 2022  
 20 estimated that in Alberta, there was a less than  
 21 1 percent loss of energy production using this method  
 22 to reduce bat fatalities.  
 23 Next slide, please. At Oyen, the  
 24 preconstruction -- or, sorry, the Alberta bat  
 25 mitigation framework for wind power development

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1 specifically states that cumulative effects of nearby  
 2 sites must be taken into account. So here is a map  
 3 which we saw yesterday as well, indicating the various  
 4 operating wind facilities in the Oyen area, and I  
 5 focused my report on Sharp Hills and Lanfine, the two  
 6 sites directly north and directly south of the proposed  
 7 Oyen facility.  
 8 At Oyen -- next slide, please. At Oyen, we have  
 9 not only the most number of turbines proposed, 83, of  
 10 the various sites near Oyen but also the tallest, the  
 11 largest turbines, with a tip height of 210 metres above  
 12 the ground.  
 13 Next slide, please. And studies indicate that  
 14 taller turbines kill more of each of these three  
 15 migratory species of bats, as in this paper published  
 16 in 2022.  
 17 Next slide, please. The Alberta mitigation  
 18 framework also talks about cumulative effects, and it  
 19 states that bat fatalities in the range of 500 bats per  
 20 development per year is concerning and goes on to say  
 21 that because some wind power developments are in close  
 22 proximity to one another, ESRD will track cumulative  
 23 bat fatalities due to wind turbine operations in an  
 24 area and evaluate the need for additional  
 25 postconstruction mitigation.

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1 Next slide, please. So here are the pre and  
 2 postconstruction data for Oyen and the two close sites,  
 3 Lanfine and Sharp Hills, and first of all, you can see  
 4 the preconstruction acoustic migratory bat detections  
 5 at the one and only high or raised microphone at Oyen  
 6 or .05 migratory bats per detector night was  
 7 considerably higher than the preconstruction rates at  
 8 both Lanfine and Sharp Hills.  
 9 And then we look at the mortalities per turbine,  
 10 and at Lanfine, as outlined in green here, four  
 11 migratory bats per turbine were killed in 2023, and at  
 12 Sharp Hills, almost 16 migratory bats were killed per  
 13 turbine in 2024. Those are at or above the levels  
 14 considered concerning to the Alberta government and  
 15 require consideration of mitigation, and in fact, Sharp  
 16 Hills had operational mitigation in place, and despite  
 17 that, almost 16 migratory bats were killed per turbine.  
 18 Next slide, please. So the cumulative impact on  
 19 bats of these three sites, the fatalities at Lanfine  
 20 plus Sharp Hills, is over 11,000 migratory bats killed  
 21 per year. If Oyen has the average fatality rate  
 22 between those two operating facilities, 9.97 migratory  
 23 bats per turbine, the 83 turbines will kill an  
 24 additional 827 migratory bats per year for an overall  
 25 total of 1,934 migratory bats per year.

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1 Next slide, please. And I believe the Oyen total  
2 is likely an underestimate because it had higher  
3 preconstruction migratory bat activity than the other  
4 two sites. It has taller turbines, reaching up more  
5 into the flight space of the migrating species, and  
6 Sharp Hills had operational mitigation in place. In my  
7 opinion, the cumulative fatality rate is not  
8 sustainable.

9 Next slide, please. So my conclusions are the  
10 following: The proposed Oyen wind facility is large,  
11 with large turbines being considered, and those  
12 features predict that the facility will have a large  
13 impact on bats. The high bat activity at the raised  
14 detector and high average activity among the low  
15 detectors exceed the minimum level requiring discussion  
16 regarding operational mitigation. The high fatality  
17 rate at the two close wind facilities, despite  
18 operational mitigation at Sharp Hills, suggests that  
19 the bat fatality rate at Oyen will also be high.

20 Next slide, please. Cumulatively, the fatalities  
21 at Sharp Hills and Lanfine, in addition to those that  
22 will occur at Oyen, are a serious concern. Discussions  
23 regarding the Oyen facility need to take place and  
24 actions taken to reduce the risk to bat populations.  
25 Even the current fatality rates at Lanfine and Sharp

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1 Hills are not sustainable, in my opinion.

2 If Oyen is approved, I thus recommend that  
3 operational mitigation to reduce bat fatalities be  
4 instituted immediately upon the start of operation  
5 rather than waiting to assess what the bat fatality  
6 rates are. And in my opinion, operational mitigation  
7 should initially involve blanket curtailment during the  
8 fall migration period at all turbines.

9 Next slide, please. Postconstruction fatality  
10 monitoring should be conducted from the start of  
11 operation of Oyen to assess fatality rates and the  
12 effectiveness of curtailment, and depending on the  
13 results of fatality monitoring at the three sites,  
14 further operational mitigation may be necessary.

15 And that concludes my opening statement.

16 Q. Thank you, Dr. Barclay. Have you had opportunity to  
17 listen in or review the transcripts of the proceeding  
18 to date, especially as it relates to my  
19 cross-examination of Ms. Sare on the impacts of the  
20 project on bats and mitigation measures?

21 A. DR. BARCLAY: Yes, I have.

22 Q. Do you have any comments to make regarding her  
23 responses to my cross-examination questions?

24 A. DR. BARCLAY: I have a couple of comments. When  
25 asked whether one raised bat detector is sufficient to

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1 assess the risk of the Oyen facility to bats, Ms. Sare  
2 said yes. To me, for a project as large as the Oyen  
3 facility, with 83 turbines over 95 square kilometres  
4 and a diverse landscape, one raised detector is not  
5 sufficient, especially given the variation in activity  
6 among the 10 ground-level bat detectors and the fact  
7 that raised detectors detect bats in the blade-swept  
8 area and at heights the migratory bats tend to fly at.

9 It was also noted that both Lanfine and Sharp  
10 Hills had operational mitigation in place during their  
11 first years of operation, and yet bat fatality rates  
12 were high. Ms. Sare also noted that the bat activity  
13 recorded at the Oyen site resulted in a classification  
14 of high risk to bats, yet it was stated that WSP will  
15 wait to see what the bat fatality rate is at Oyen  
16 before discussing potential operational mitigation.

17 I'm not sure why that is appropriate given the  
18 rating as high risk, the high cumulative fatalities  
19 already in the Oyen area, the large number of large  
20 turbines proposed for Oyen, and the demonstrated low  
21 cost of operational mitigation. As I note in my  
22 report, I recommend that operational mitigation be in  
23 place from the start of operation of Oyen.

24 Q. So one more question for you, Dr. Barclay. In my cross  
25 of Ms. Sare yesterday on whether increasing bat

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1 fatalities will cause a decline in population of  
2 migratory bats, she deferred to your opinion, stating I  
3 should ask you that question, as she's not the expert  
4 on bats.

5 What is your opinion on this? Will an increase in  
6 bat fatalities cause a decline in migratory bat  
7 population and consequently an adverse impact to the  
8 ecosystem?

9 A. DR. BARCLAY: Yes, thank you. As I noted in my  
10 report, there's already evidence that populations of  
11 the migratory species of bats have declined, and a  
12 large decline in the population of hoary bats in  
13 particular is predicted by the end of this decade.

14 As I stated in my report, I do not believe the  
15 fatality rates at the combined Lanfine and Sharp Hills  
16 are sustainable, and Oyen, with a large number of large  
17 turbines, will only add to that unsustainable fatality  
18 rate.

19 I'll also note that there's a relevant recently  
20 published paper in the journal Science, one of the top  
21 scientific journals, regarding the environmental impact  
22 of declines in some bat species. In this case, they  
23 were looking at declines in species due to a fungal  
24 disease called white nose syndrome, and in that paper,  
25 areas in North America with large bat population

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1 declines had a corresponding increase in use of  
 2 pesticides for agriculture, essentially because the  
 3 bats were not there to control pest insects themselves.  
 4 So an increased cost to farmers. If we see a decline  
 5 in the migratory species, it's likely that that benefit  
 6 that bats provide for agriculture will also be lost  
 7 here in Alberta.

8 Interestingly, in that paper, there was also an  
 9 increase in human infant mortality rates in those areas  
 10 with bat declines, which the authors related to  
 11 increased pesticide use. I have provided Ms. Okoye  
 12 with a copy of that paper should it be needed to be  
 13 placed online.

14 Q. Thank you, Dr. Barclay.

15 I will now go over to Mr. Farquharson. Again,  
 16 Mr. Farquharson is known to the Panel.  
 17 Mr. Farquharson's affidavit adopting his report and CV  
 18 has been filed as Exhibit 123.

19 Mr. Farquharson, have you had opportunity to  
 20 listen in or review the transcripts of the proceedings  
 21 to date, especially as it relates to the  
 22 cross-examination of Mr. Faszer on noise impact  
 23 assessment?

24 A. MR. FARQUHARSON: Yes, I have.

25 Q. Okay. Do you have any comments to make regarding

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1 higher count at that intersection.

2 Also to the east of the intersection, there is --  
 3 there was a -- looks like an Alberta tourism facility,  
 4 a welcoming station there. Currently, it's blocked off  
 5 on my visit out there from use. There was a  
 6 restaurant/pub venture as well that's accessed off of  
 7 Highway 41 as well.

8 So when we look at the traffic at this corner, one  
 9 end of the control segment and the other end of the  
 10 control segment, we look at -- when we have a count  
 11 where we have a large discrepancy in numbers between  
 12 the two and where we're crossing our nighttime  
 13 threshold, Mr. Faszer, in his testimony, you know,  
 14 assumed kind of in summary of a progression of the  
 15 vehicles from businesses.

16 We would assume that initially, but we would also  
 17 look along that control section to see if there's any  
 18 commercial ventures that would draw more traffic. Is  
 19 there any centres of habitation that would create more  
 20 traffic to flow one way on the route or not?

21 So kind of in review of that, you know, what  
 22 concerns me is we do have a centre of activity here  
 23 right close to the intersection where the count was  
 24 done. I mean, the only count the vehicles that are  
 25 going through the intersection and the directions they

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1 Mr. Faszer's responses to the cross-examination  
 2 questions in relation to noise impacts?

3 A. MR. FARQUHARSON: Yes, I have. I'd like to take us  
 4 to Exhibit 146, which was Aid To Cross Number 5  
 5 yesterday. So it presents the -- if we could bring up  
 6 that exhibit, please. Yes. And there it brings up a  
 7 map of the corner where the traffic count is done for  
 8 the control segment at Highways 9 and 41.

9 So in both a trip to the area this spring and  
 10 what's easily seen on street view in Google is that at  
 11 this corner, we have some activities. So of note here  
 12 is just to the north of the intersection along  
 13 Highway 41, there is an approach or an entry onto the  
 14 highway from a series of commercial premises that go to  
 15 the west along Highway 9.

16 So there's a cardlock, there's a fuel station,  
 17 there's a farm agri supply centre. There's a filling  
 18 station, a convenience store, an A&W. These particular  
 19 businesses can be accessed easily from Highway 41.  
 20 There's only one entry for these businesses, plus a  
 21 hotel and a campground, that goes onto Highway 9.

22 And so we could have vehicles that would be in the  
 23 count for this intersection that are primarily using  
 24 these businesses that are northwest of the intersection  
 25 that are accessing them via Highway 41 and creating a

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1 may take, they don't necessarily look beyond that and  
 2 say, well, that vehicle turned into the cardlock or,  
 3 you know, it originated from south on 41 and went into  
 4 the cardlock as well or into the -- into the farm agri  
 5 centre there.

6 So, you know, without a traffic count along, you  
 7 know, say, a point halfway along this control section  
 8 or a traffic count near the residences in question  
 9 here, especially I think it's residence 8 and 8A, we  
 10 don't have -- in my opinion, we don't have great  
 11 evidence that indeed we have a vehicle count that's  
 12 over the nighttime threshold for this area. So the --  
 13 this exhibit can be taken down.

14 So I heard that, and that would revert the  
 15 placement of these four homes back into Category 1, and  
 16 although Mr. Faszer was committed to undertake to  
 17 provide new results with the Category 1 application of  
 18 the PSL, the ambient adjustment, we haven't seen those,  
 19 I believe, as of yet, but just some review by myself is  
 20 that we would be -- have nighttime cumulative sound  
 21 levels from the development of 41 at three of the four  
 22 homes.

23 So this places the facility in exceedance, unless  
 24 we pursue some form of mitigation, either by removal of  
 25 turbines so they don't become stranded assets, or

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1 through some method that was discussed yesterday and  
 2 that I've also discussed as some sort of reduced noise  
 3 mode operational condition, but we -- we're left to  
 4 wonder what that might do in this case.

5 That concludes my review of yesterday's testimony.

6 Q. Thank you, Mr. Farquharson.

7 Going now to Chris Tenszen. Chris Tenszen is a  
 8 partner and the practice area lead for reclamation and  
 9 restoration at Trace Associates Inc. His areas of  
 10 expertise are land reclamation and ecological  
 11 restoration with a focus on natural area land uses such  
 12 as forested land, native grasslands, and peat lands.  
 13 He's a registered professional agrologist in Alberta  
 14 and a member of the Canadian Land Reclamation  
 15 Association and the Society for Ecological Restoration.  
 16 He prepared a report on decommissioning and  
 17 reclamation, and this is his first time appearing  
 18 before the commission.

19 Mr. Tenszen's affidavit adopting his report and CV  
 20 has been filed as Exhibit 121.

21 Mr. Tenszen, have you had opportunity to listen in  
 22 or review the transcripts of proceedings to date,  
 23 especially as it relates to the cross-examination of  
 24 Mr. Cuthbert on reclamation?

25 A. MR. TENSZEN: Yes, I did.

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1 place below the final reclaimed surface, the operator  
 2 must demonstrate that the remaining infrastructure will  
 3 not result in an adverse effect. Goes on to say will  
 4 not interfere with restoring the site to equivalent  
 5 land capability, including but not limited to impacts  
 6 to surface or subsurface drainage or crop growth.

7 So it introduces an uncertainty there that I want  
 8 to really focus on, and that's to date, to the best of  
 9 my knowledge, no turbine site in Alberta has been --  
 10 has yet to receive a reclamation certificate. So we  
 11 don't have a body of evidence that's directly  
 12 applicable to demonstrate that no adverse effect.

13 And in addition to the potential impacts to land  
 14 operability that are mentioned in that paragraph,  
 15 there's also the potential to reduce future land uses,  
 16 as Ms. Okoye brought up yesterday when she was asking  
 17 about agricultural use dugouts, potential restriction  
 18 to those activities in the future.

19 There's a limited amount of information available  
 20 online about some recent reclamation and  
 21 decommissioning projects, in 2022 in Pincher Creek, in  
 22 2023 in South Dakota, but they don't provide any  
 23 details about reclamation status or success yet, and  
 24 those things take a few years to demonstrate, so it's  
 25 too early yet to show that.

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1 Q. And bearing in mind the Commission's ruling that -- the  
 2 Panel's ruling yesterday, they do not want to hear  
 3 about reclamation security costs, do you have any  
 4 comments to make regarding Mr. Cuthbert's responses to  
 5 cross-examination questions in relation to reclamation  
 6 generally?

7 A. MR. TENSZEN: Yeah, I do still have one concern  
 8 that I'd like to discuss as it relates to the  
 9 reclamation method surrounding the foundation removal.

10 So I'd like to draw attention -- it's PDF page 95  
 11 of the transcript. Mr. Cuthbert made the comment that  
 12 it's appropriate to assume that the 1.2-metre partial  
 13 removal depth would be sufficient for the purpose of  
 14 the CNR plan.

15 I'd like to draw attention to the Commission, you  
 16 know, when considering the application and the public  
 17 interest for this, concerns about that foundation  
 18 removal depth. Aid To Cross, I believe it's number 10,  
 19 the CNR directive, we looked at it yesterday. I -- is  
 20 it necessary to pull it up again if I want to refer to  
 21 that?

22 Q. No, you can just talk about it generally.

23 A. MR. TENSZEN: Okay. I have it open here, so  
 24 I'll just paraphrase.

25 It's clear it says infrastructure being left in

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1 So what I want to draw attention to is in  
 2 Exhibit 8, which is the environmental evaluation,  
 3 there's mention of turbine removal, and to paraphrase,  
 4 it says -- or I guess to quote, it says: (as read)

5 **"The wind turbine's concrete foundation**  
 6 **will be removed to a depth of 1.2 metres**  
 7 **below surface, and the excavation**  
 8 **backfilled with subsoil to match the**  
 9 **natural grade. Removal of below-ground**  
 10 **concrete structures to a depth of**  
 11 **1.2 metres is expected to provide a**  
 12 **sufficient profile to allow successful**  
 13 **revegetation and typical land use**  
 14 **practices despite the underlying remnant**  
 15 **concrete foundation."**

16 **Now, my concern with that is it doesn't acknowledge the**  
 17 **uncertainty. It's speaking in expectations, not quite**  
 18 **absolutes, but it doesn't acknowledge the fact that we**  
 19 **don't have any body of knowledge to prove that no**  
 20 **adverse effect has been achieved to date, nor does it**  
 21 **acknowledge the uncertainty that's, you know, directly**  
 22 **alluded to in the directive.**

23 **And then the recent code of practice also states**  
 24 **that a CNR plan has to be prepared that's in accordance**  
 25 **with the CNR directive, and the CNR plan submitted by**

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1 **RES, which is Exhibit 11, it actually makes no mention**  
2 **of foundation removal.**

3 **So in summary, I guess just I want to draw**  
4 **attention to the significance of this foundation issue**  
5 **because as we see, you know, thousands -- potentially**  
6 **thousands of these things across the landscape, and**  
7 **they're large, like upwards of 5,000 tonnes of concrete.**  
8 **My professional opinion is that I foresee these becoming**  
9 **one of the more contentious issues as these turbine**  
10 **farms approach an end-of-life and decommissioning phase.**

11 **So if the project is approved, I strongly recommend**  
12 **that this uncertainty around the appropriate removal**  
13 **depth, you know, be acknowledged in the approval**  
14 **conditions or in the CNR plan, acknowledging that level**  
15 **of uncertainty that's presented in the CNR directive.**

16 **That's what I -- that's what I have to say. Thanks.**

17 MS. OKOYE: Thank you, Mr. Tenszen, and I'll  
18 hand it over to my colleague Mr. Kema to complete the  
19 direct of our expert panel.

20 **MR. KEMA EXAMINES THE PANEL:**

21 Q. Thank you, Ms. Okoye. Good morning, Mr. Chair. I'll  
22 be handling the examination-in-chief for  
23 Dr. Bellut-Staeck.

24 Dr. Bellut-Staeck is a medical doctor specializing  
25 in general practice and emergency medicine with a focus

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1 The point is that this is a very small region, in  
2 the nano and micrometre area, so it was not possible  
3 before 2000 to see the structure or function of  
4 microcirculation, little capillaries with the  
5 endothelial cells as in a layer. In former times,  
6 people thought, also in medicine, it was also my  
7 studying still in this time before 2000, that it's only  
8 a layer like -- like to hold the fluid inside, but  
9 since 2000, we know much more about.

10 So two important research results. We have since  
11 about 2010, not before, which play a big role now what  
12 we can understand that the body is able to feel and  
13 hear not only with the ear but with inner receptors in  
14 the -- this capillary system, including also the skin,  
15 and these receptors are called mechano-sensors. So  
16 they are sensors for forces.

17 And this is most of the important discovery of the  
18 last years, I think also for the whole medicine because  
19 this was a really new level of perception important for  
20 all organism. And so Mr. Ardem Patapoutian was awarded  
21 with the Nobel Prize in medicine for that in 2021. The  
22 research about these most important channels, the most  
23 important are the PIEZO channels is beginning in 2010  
24 about, so we can find beginning research in PIEZO  
25 channels then, but this award was a reward to say this

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1 on cardiovascular diseases, microcirculation, and  
2 endothelial functions, vascular biology, and stress  
3 medicine. Dr. Bellut-Staeck is a member of the  
4 scientific advisory board of the German Society for the  
5 Prevention of Noise-Induced Illnesses.

6 Dr. Bellut-Staeck prepared a report which focusses  
7 on the impacts of infrasound frequencies and vibrations  
8 from wind turbines on human health. This is her first  
9 time appearing before the Commission.

10 Dr. Bellut-Staeck's affidavit adopting her report, her  
11 CV, and her information response has been filed as  
12 Exhibit 125.

13 Ms. Adebayo, please pull up Dr. Bellut-Staeck's  
14 opening statement.

15 A. DR. BELLUT-STAECK: Can you support me with this  
16 opening statement?

17 Q. I don't think -- Ms. Adebayo, I don't think -- okay.  
18 Thank you very much.

19 Please proceed, Dr. Bellut-Staeck.

20 A. DR. BELLUT-STAECK: Yes, hello. Just a moment. Okay.

21 Yes, this is my first file, so it means that we  
22 had in the research of microcirculation, this is the  
23 capillary vessel system, which support each organism  
24 with nutrition, mainly, that we have a lot of increased  
25 research results, especially in the last 15 years.

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1 new level is so important for all organism because  
2 organism need to have a perception for air pressure,  
3 for proprioception, for pressure as a whole, for sound  
4 due to the fact that also sound is a physical force.

5 Ardem Patapoutian classified PIEZO channels as  
6 currently the most important group of mechano-sensors,  
7 a crucially newly recognized level of perception of  
8 physical forces and sound in all living things. You  
9 will find them in all multicellular organisms. You  
10 will also find PIEZO channels in the new research in  
11 plants.

12 As a second very important research point, for  
13 especially our theme, is that vital functions are ruled  
14 by coordinated forces in the bloodstream. We are  
15 looking in the capillaries in a flowing bloodstream,  
16 and I will show you later on a graphic. You can have a  
17 better impression how we can imagine that forces act  
18 there to organize to rule some vital regulations.

19 These coordinated forces causes thrust forces to  
20 act on the endothelial membrane. I also told you that  
21 all vessels, especially also the capillary system, has  
22 an inner layer of endothelial cells. These forces  
23 moves sideways on the membrane and opens the PIEZO  
24 channel. You will see it in the graphic how it can be  
25 demonstrated in a schematic picture.

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1 This movement is perceived by different receptors  
2 of forces. They are more than one, but like I told  
3 you, PIEZO channels in this case in the vessels are  
4 PIEZO-1 channels, and the most important, they are  
5 embedded in the membrane of the endothelial cells.

6 Next slide, please. Now there is a picture. It's  
7 already to be seen in German in my -- or in English, I  
8 also told it in my evidence. It's in my book  
9 Essentials of Springer Nature, and this is to be  
10 explained what we can expect in the vessels. And this  
11 is really now a nano area.

12 This is the surface of the endothelial cell. You  
13 imagine that here is the blood flow. This is the  
14 vascular area, and we find some structures on these  
15 membranes. And what you can see in the middle of the  
16 picture is a PIEZO-1 channel embedded in this layer of  
17 the endothelial cell.

18 And now it's not -- it's quite complex, but if you  
19 see that you can perhaps understand that driving  
20 forces, the blood flow itself, is a mechanical force  
21 which can work on this membrane. It can work as this  
22 that these PIEZO channel opened its plates and let  
23 calcium ions through the membrane.

24 PIEZO, we know from the electricity is the  
25 transformation of forces in electric information. When

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1 the capillary vessels are like semipermeable membranes,  
2 and like switch holders to decide what they let  
3 through.

4 So in this place, there is the exchange of  
5 nutrients and oxygen. There is also the regulation of  
6 the width of the vessels, and therefore, you can  
7 imagine if you have an autotune regulation, it's always  
8 guaranteed that you get enough substrate and nutrients  
9 on the place it is afford for.

10 So you can -- if you are running, you need more  
11 energy in your muscles, so the endothelial regulation  
12 will support the perfusion in the muscles and lead the  
13 blood to there to support the best way.

14 Another very important regulation is growth, the  
15 normal growth of a child or embryological functions.  
16 You have to imagine that on this level, there is the  
17 beginning of the vascular kinases, and in the  
18 developing embryo, before all the structures is built,  
19 the vascular system is the first, and the forces in the  
20 vascular stream are the forces will lead to the  
21 development of the first growth of the embryo.

22 All you can see, it is also the transport system  
23 for hormones, for medications. Yes, sometimes also for  
24 toxin we take in. Then it is the homeostasis for  
25 fluids. It decided if the fluid is -- let it in or

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1 this information is coming in, then it leads to a  
2 biological information.

3 So what are vital functions, you will know? More  
4 and more we are clear that on this level of the  
5 microcirculation in the little capillaries, most of our  
6 vital function are organized. So I will show you later  
7 on a slide that you can see which functions these are,  
8 and we know all organisms are dependent in their vital  
9 functions from laminar forces. Laminar means that  
10 there is a laminar streaming in the vascular inner side  
11 of the capillary.

12 The second precondition for a good performance of  
13 these functions is that the endothelium itself -- this  
14 is only the surface -- is in a healthy state and  
15 without introduction of the laminar flows. And what  
16 Ardem Patapoutian also said, all organisms need to have  
17 a perception for external forces like proprioception,  
18 air pressure, and so on. So we need that air pressure  
19 can go through and make informations on this level.

20 Please the next slide. So it is out -- taken out  
21 also of my Essential book for Springer Natured where I  
22 looked in the -- all the new research advances of the  
23 last 15 years, and this cannot be complete because this  
24 is still ongoing research. But what I can tell you and  
25 I highlighted in yellow, our endothelium inner side of

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1 out. It is the most important place for regulation  
2 our -- of our immune system.

3 It deals with inflammation. You have to imagine,  
4 we need inflammation because we have to restore -- if  
5 there is an injury, we have to restore the tissue and  
6 the structure, and in this phase -- in this phase, what  
7 is meaning in English, phase?

8 THE INTERPRETER: Phase.

9 A. DR. BELLUT-STAECK: Yeah, in this phase, the immune  
10 cells out of the vessel is going into the tissue and  
11 make a certain development and then the structure in  
12 the best way is in a -- is leading to a -- (German  
13 spoken), in complete healing.

14 So this is an overview just -- the endothelium can  
15 secrete chemokines, cytokines, mediators. You see this  
16 is really at once of the last 15 years, and it will  
17 last perhaps 5 years or 10 years more so that the  
18 public interest is more on this really basic -- basic  
19 of life foundations.

20 So the next slide, please. This is the slide --  
21 the first slide. I asked for -- this one, yes.

22 What I told you till now is state of the art in  
23 medicine is generally accepted all over the world, in  
24 universities, and it's a fixed state now, and when you  
25 now see that a foreign external forces like infrasound

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1 with specific properties, and all of you will agree  
2 that infrasound has the property to go through every  
3 viscoelastic material. Also we in our tissue are  
4 viscoelastic.

5 So also, by the way, roofs or houses' walls are  
6 viscoelastic, so the deeper the frequency, the more  
7 infrasound is going and transmitted as energy transport  
8 through everything.

9 By the way, the deeper the frequency, the longer  
10 the waves, the more the bendings, and the less to be  
11 dammed infrasound. You need -- you cannot dam  
12 infrasound in these regions under 10 hertz because it  
13 is not possible just to make a wall as big as  
14 infrasound can be dammed.

15 So if you see now that it's possible that  
16 infrasound is going through organism, why shouldn't it  
17 go to the level of the endothelial cell in the  
18 bloodstream, because this is what we can see in the  
19 results of the studies I did the research on. And this  
20 what you can see here is the only part of my  
21 hypothesis, all what I told you before is the state of  
22 the art already.

23 And I was the first to think about because I  
24 compared the symptoms of the people and the animals.  
25 With my wisdom -- I did since 20 years microcirculation

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1 on the other side, this is already proven research  
2 science. It is long established in the autoregulated  
3 system of the microcirculation that nitric oxide is  
4 emitted adequately. This is the most important  
5 situation because we do not make anything. Our system  
6 realizes where its need for NO and adequately to NO  
7 emission, the vascular width is getting bigger.

8 What we know since many years, if NO is not  
9 adequately emitted at the right time in the right place  
10 and in the correct amount, oxidative stress increases.  
11 And you can see also in my papers, that is known that  
12 oxidative stress, if it is going on chronically, is one  
13 of the basics condition for development of  
14 arthrosclerosis and all of the following diseases like  
15 stroke, like cardiac attack.

16 And what you can see in this list, this source is  
17 also in my two papers, that normally NO, nitric oxide,  
18 has protective effects. It's most important normally  
19 antioxidant. It inhibits leukocytes and platelet  
20 adhesion. I do not read whole, but -- all those  
21 things, but I can tell you if NO is not adequately  
22 emitted, it has deleterious effects, and that, from my  
23 point of view, is one of the bases why we have here a  
24 situation that NO is emitted not adequately, and what  
25 we can show in the studies I also added in my papers

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1 research -- with my wisdom that the symptoms are  
2 showing me that there is something bad with the  
3 microcirculation, and up to this point, I began to  
4 study it.

5 What you can see here is one of the pulse of  
6 infrasound pulse, as it's known from a wind turbine,  
7 and this is important because in biological systems, we  
8 know that a stressor which has an acceleration is much  
9 more leading to a biological information than a steady  
10 state stressor.

11 Compare, please, what you know from the nose.  
12 When we smell something, after some time, we don't  
13 smell it anymore. So this is to be comparable, and I  
14 also can show you later on that is found in the  
15 sources, and it's in my papers, that researchers got  
16 out already that the -- exactly this.

17 They did research about this impulsive stressor,  
18 and they realized that this is one of the things that  
19 makes the situation so dangerous, because we have  
20 continuously stressors all the way.

21 You have to know, microcirculation normally would  
22 recover soon. It has a big recover possibility, but if  
23 you have a chronic stressor, you agree with me, then  
24 recoverment (sic) is nearly not possible.

25 The next slide, please. Now we are -- meanwhile,

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1 that there is an increase of lipid peroxidation of  
2 oxygen radicals. And we have a situation here also of  
3 more susceptibility for radiation, toxic metals,  
4 alkylating substances. This is state of the art  
5 already since long time.

6 Please the next slide. What are the consequences?  
7 When we imagine that infrasound might come to the  
8 endothelial level and it's leading to irregular  
9 inflammation about irregular sensation on the  
10 mechano-sensors, mainly the PIEZO channel, then it's a  
11 consequence that we have functional disorders of the  
12 microcirculation, and that's what we can see worldwide.

13 We find signs of energy loss. We find dizziness.  
14 We find headaches. We find tinnitus. We find weak  
15 muscles. We find thoracic pressure. And if there is a  
16 long-term impact, then we must expect increased  
17 oxidative and also oscillatory stress.

18 This is the condition for an inflammatory state of  
19 the endothelium, and then you remember now a lot of  
20 functions of endothelial functions like regulations of  
21 inflammation, like growth, like coagulation, like  
22 regulation of blood pressure, embryological function,  
23 then you will understand that if there are irregular  
24 inflammations that we are in a situation of stress for  
25 one of the bases of life.

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1 So inflammation of the endothelium tends to lead  
2 to high blood pressure, vascular diseases, heart  
3 attacks, strokes. But nobody can say if you are in a  
4 state of these illnesses and go to your doctor and say  
5 I think also the wind turbine added to my illnesses,  
6 nobody can prove.

7 So we had to get out a pathophysiological way to  
8 say this is a dangerous situation for people in the  
9 near and also I must say for animals, also insects,  
10 also whales in the sea, that we have something manmade  
11 done which is not comparable with an earthquake or with  
12 driving a car or with -- have long flights. Then we  
13 can really have also signs, symptoms of infrasound long  
14 impactment, but this is our own decision. But if we do  
15 that in the houses of people, we have a protected room,  
16 and the people cannot protect themselves because you  
17 know infrasound is not dammable.

18 Please -- I think there's another one, please, the  
19 next. Yes, this is one of my conclusions after years  
20 of research, I am in this research since -- I'm in the  
21 theme of microcirculation since 24,000 -- 2004, and  
22 since 2015, I'm in the research why infrasound probably  
23 can affect organism.

24 All organism are equipped with mechano-sensors, in  
25 particular PIEZO channels. For this reason, all

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1 organisms could be impacted by manmade infrasound.  
2 Therefore, the impacts of infrasound frequencies and  
3 vibrations on people residing in close proximity to  
4 industrial wind turbines cannot be simply dismissed  
5 based on old studies.

6 We have to accept that science is changing. The  
7 wisdom is not changing but the wisdom about and with  
8 the increased possibilities of what we had after 2000,  
9 these functions could be evaluated. So findings from  
10 new studies must be considered in this situation.

11 A cautionary approach to establishing the setback  
12 for an industrial wind turbine project should be  
13 adopted. The distance at which serious health  
14 disturbances may be avoided is to be determined  
15 scientifically and not based on old studies.

16 Factors such as the descending fundamental  
17 frequencies due to the increasing size of rotor  
18 diameter, the main wind direction and wind speeds, the  
19 interaction of emissions from several wind turbines,  
20 the possible interference between different wind farms  
21 and the topography must be considered.

22 Before establishing safe distances, various  
23 low-frequency forces need urgently to be reevaluated in  
24 terms of their effects before establishing safe  
25 distances could occur.

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1 Q. Thank you, Dr. Bellut-Staeck. Have you had an  
2 opportunity to listen in or review the transcripts of  
3 the proceedings to date, especially as it relates to my  
4 cross-examination of Dr. Ollson on infrasound from wind  
5 turbines?

6 A. DR. BELLUT-STAECK:Yes, I had the possibility.

7 Q. Great. Do you have any comments to make, and if you --

8 A. DR. BELLUT-STAECK:I have some comments, yes.

9 Q. And if you do, please can you briefly provide your  
10 comments? I know our time is up, so can you briefly  
11 summarize your comments that you have. Thank you.

12 A. DR. BELLUT-STAECK:M-hm. I have a comment. So if we  
13 can open the transcript from yesterday with Dr. Ollson,  
14 can you...

15 Then on the side, 131. This is I think -- yes, I  
16 think this is not the time to go into the details, so I  
17 will try to summarize.

18 So when I see the statement when Mr. Kema asked  
19 Dr. Ollson if it is a common misunderstanding that  
20 infrasound is inaudible, levels of infrasound emitted  
21 from wind turbines are orders of magnitude below --  
22 below the infrasound audibility threshold, and his  
23 answer, "So yes, as you can see if you were to look at  
24 the paragraph below the picture," so I will ask for my  
25 evidence. There we can see the graph I have to show --

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1 it's in my evidence, X0096.

2 I will show you the page. Yeah, it's on page 17.

3 Yes, that's it. That's the first graph. I will speak  
4 also to another because Dr. Ollson used.

5 So Dr. Ollson is most of the time telling from  
6 studies in the 2012, '14, '16, like the Michaud study,  
7 and I think in this time, it was really quite normal to  
8 take the dBA, but what I can show you here, we know  
9 meanwhile also in these weightenings more how we can  
10 really show the exact SPL levels of infrasound under  
11 20 hertz, because if you can see, the A weighting,  
12 you can see that it's going just under 10 hertz, and  
13 you cannot prove between 0 and 10.

14 So with dBA, you will go into the infrasound but  
15 not enough because, as we know, wind turbines emit  
16 mostly between 0.2 and 12 hertz, so it's this part they  
17 emit, and also what he spoke about, the G, there you  
18 can see this curve is going far in the infrasound part,  
19 but you can see what is about the reduction of SPL.

20 So I show you the only weighting, what you can  
21 do to calculate infrasound in the real extent. So it  
22 is the set -- the unweighted or 0 weighting. This  
23 is my answer to the first comment here, also to some  
24 others because he told it's enough just to say I will  
25 pick up the dBA and then I will pick up also -- it's a

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1 little bit -- I have to...  
 2 Also, the dB -- yes, okay. Yes. Also the dBC.  
 3 So you can see, if you see that it's more than 20, so  
 4 we know there must be infrasound. But this is not the  
 5 measurement, yeah? This is not sufficient to say  
 6 something about this part.

7 And so I will show you -- this is a very clear  
 8 graphic that you can really see dBA is really suitable  
 9 for acoustic sound, and the created dBG is not  
 10 sufficient to show the values here, and dBC, you see  
 11 the same. You can only see if there is a difference,  
 12 there is infrasound.

13 And then I must go on another graph, because also  
 14 yesterday, I realized that Dr. Ollson talked sometimes  
 15 in the infrasound part, we only have 10 or 15 hertz.  
 16 So this can come from the situation that he uses  
 17 weightenings which cannot so -- show the real values,  
 18 you see?

19 So I show you other graphs. It's in my -- just a  
 20 moment. First I'll show you -- I can show you this  
 21 one. It's on the page -- on the page 26, please, the  
 22 graph.

23 Picture number -- yes, in the -- yes, in this  
 24 part. It's also you recognize this graph also  
 25 Dr. Ollson used, but the -- the decisive point, what I

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1 countries, we see that we have to respect and to  
 2 reevaluate what these infrasound is making in the --  
 3 (German spoken).

4 THE INTERPRETER: In dealing with the various  
 5 organisms.

6 A. DR. BELLUT-STAECK: Yes, thank you. Thank you.

7 So I have a look, a second look in the testimony  
 8 of Dr. Ollson from yesterday because I signed what is  
 9 important. Yeah. Yeah.

10 He mentioned here in -- it's slide 160. He  
 11 mentioned that he has conducted primary research on the  
 12 impact of wind turbines on individuals. This was the  
 13 question from Mr. Kema, and he told us that he did some  
 14 studies.

15 We can find him -- the studies in number -- in the  
 16 expert report from Dr. Ollson from 26 of May 2025. And  
 17 I looked in the studies, but it's about -- all of the  
 18 studies about health assessment and not about  
 19 infrasound.

20 And to be short, in his statements yesterday in  
 21 the testimony, he also looked -- told us that from his  
 22 side of view, there are since 2020 no more studies  
 23 about infrasound which can show there are severe health  
 24 effects, and from my side of view, this is not right  
 25 because I realized in the same time as I was on the

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1 will say, you will see that in the infrasound part up  
 2 to here, this is the increasing level of infrasound,  
 3 and you can see this is set -- this is zero  
 4 weightening, and these are the real SPL of infrasound,  
 5 so we have levels between 50 and 80, and you know, with  
 6 a bigger -- with the taller wind turbines, it's more.

7 So this is a graph from 2016, and from 2016 to  
 8 now, we have really taller wind turbines, and as you  
 9 know, if you increase the rotors, you get deeper  
 10 frequency, and you get more emissions, and you get  
 11 higher values.

12 It's not only the electricity production which is  
 13 getting higher, it's also the emission which is getting  
 14 higher. And as you also know, perhaps, it's not a  
 15 double. It's a -- what can you say it in English?  
 16 It's the potential minus 3 of increasing the production  
 17 and also the emissions.

18 And if we say that we have to respect the part of  
 19 infrasound, then you cannot say it's important where  
 20 our threshold of ear, of -- of hearing, acoustic  
 21 threshold is. If we have a perception on another part  
 22 of the body, the perception threshold cannot be anymore  
 23 the threshold for the working of infrasound.

24 So we have really for my side -- and I have a lot  
 25 of reviews meanwhile also, contacts to the foreign

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1 research that a lot of studies came up in this time  
 2 since 2017, and I can only show, you know, a few which  
 3 are important to understand that there are studies  
 4 which show there is an impact, and I therefore will  
 5 call the Weichenberger study -- it's in my evidence of  
 6 the 14 of April with the number X0096.

7 And you can see in my references, under number 9,  
 8 this is a study from 2017 that Weichenberger, et al,  
 9 could show that altered cortical and subcortical  
 10 connectivity to infrasound administered near the  
 11 hearing threshold. So what I can explain you to the  
 12 study, this was made from the University of Hamburg and  
 13 Charité Berlin.

14 People were impacted with infrasound in a double  
 15 blind study, either with infrasound under the hearing  
 16 threshold or with nothing, and at the same time, and  
 17 this is the important thing, an MRT was made, a  
 18 so-called FRMT, and the result in this study was that  
 19 three parts of the brain were signalling that they were  
 20 active, and these parts of the brain were centres for  
 21 emotion, centres of anxiety, and centres of fear, and  
 22 also another one who is responsible also for blood  
 23 pressure and pulse frequency.

24 So this was a really decisive studies to show that  
 25 under the impact of not audible infrasound, this is a

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1 definition also, infrasound is not audible. The impact  
2 was a signalling activity in the brain, and there have  
3 to be more research, but from my side of view, it can  
4 be that it's one of the reason why people have sleep  
5 disorders.

6 If you have an activation in the night in your  
7 anxiety centre, you cannot sleep. This is comparable  
8 with -- I should -- it's an old study, but elephants  
9 have comparably sensitivity for earthquakes, so they  
10 realize over their skin and there is a direct  
11 connection to the brain and so they will go away from  
12 the place, similar to goats.

13 So we can see also from animal side, infrasound is  
14 perceived, but it's not important, it's not acoustic  
15 situation, it's perception of receptors which are not  
16 known before 2000.

17 I will say a second thing. Yes. I told you that  
18 Dr. Ollson told that there are no studies about  
19 infrasound. In my reference lists, I will point on  
20 some studies which I also took in my paper.

21 Q. Yeah, thank you, doctor. If you could please  
22 summarize. I just want to note that our time is up,  
23 but if you could summarize, thank you.

24 A. DR. BELLUT-STAECK: Yeah, I know. Okay, it's so  
25 complex, so it could be say really a lot about. But

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1 it's very stringent and consequent now.

2 But just a last word, it's the study, point 20  
3 till 70 -- 26, there are six studies which mainly took  
4 place in China, and these are studies with infrasound,  
5 and they could realize that tissues are reacting, cells  
6 are reacting to this.

7 MR. KEMA: Thank you very much,  
8 Dr. Bellut-Staeck.

9 Mr. Chair, the OLG's expert panel is available for  
10 cross-examination. Thank you.

11 THE CHAIR: Okay. Thank you. What we'll do  
12 is we'll take our morning break. We're at 10:35, so  
13 we'll be back -- let's come back at 10 to 11, so 10:50.

14 (ADJOURNMENT)

15 THE CHAIR: I think we're just waiting for  
16 Mr. Farquharson.

17 And while we're waiting, there was one matter that  
18 was brought to my attention, and that is that the  
19 opening statement for Ms. Ballut-Staek has not been  
20 marked as an exhibit, and so we'll add that to the  
21 record, and we'll mark that as Exhibit 153.

22 **EXHIBIT 153 - OPENING STATEMENT OF**  
23 **DR. BALLUT-STAECK**

24 THE CHAIR: Okay. I see Mr. Farquharson. So  
25 now the next step is to allow for RES cross-examination

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1 of the OLG expert witness panel. I'll turn it over to  
2 counsel for the applicant.

3 **MS. OLENIUK CROSS-EXAMINES THE PANEL:**

4 Q. Good morning, Chair. So just in terms of a roadmap for  
5 our cross-examination, I can advise that we do not have  
6 any questions for Mr. Wallis or Mr. Tenszen.

7 I have a few questions for Mr. Farquharson and  
8 Dr. Barclay and then my colleague Ms. Bouey has some  
9 questions for Dr. Bellut-Staek.

10 So just turning to you first, Mr. Farquharson, so  
11 in your direct evidence this morning, you referred to  
12 an aid to cross provided to Mr. Faszler marked as  
13 Exhibit 146 for identification purposes. Do you recall  
14 that?

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

16 Q. And in your direct evidence, you questioned  
17 Mr. Faszler's opinion in the noise impact assessment  
18 regarding whether a PSL adjustment was warranted for  
19 four receptors near Highway 41 and 9 due to proximity  
20 to a heavily travelled road; correct?

21 A. MR. FARQUHARSON: That's correct.

22 Q. So in your report, which is Exhibit 86, can you point  
23 me to where you raised this issue or challenged  
24 Mr. Faszler's opinion on traffic and the classification  
25 of these four receptors?

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1 A. MR. FARQUHARSON: No, I did not. I did not look at  
2 the traffic at that time. It was -- it was an  
3 oversight by myself. I apologize to the Commission for  
4 that.

5 Q. Okay. So your observations today about traffic and  
6 businesses located long Highways 9 and 41 and your view  
7 that these four receptors may not warrant a higher PSL,  
8 those are new? You haven't previously provided that  
9 information to the Commission in this proceeding?

10 A. MR. FARQUHARSON: No, I did not.

11 Q. And, Mr. Farquharson, were the 2015 to 2024 traffic  
12 counts presented in the aid to cross published by  
13 Transportation Alberta just this past weekend, or was  
14 it available to you before then?

15 A. MR. FARQUHARSON: It was available before then.

16 Q. So you could have -- you could have included those  
17 traffic counts in your evidence, then, sir?

18 A. MR. FARQUHARSON: I could have if I -- if I delved  
19 into the traffic issue. I was -- I got caught up in  
20 delving into other issues on this particular file, and  
21 it was an oversight on the traffic.

22 Q. Okay. And you'd agree with me, sir, that if you had  
23 included it in your evidence, Mr. Faszler would have had  
24 an opportunity to respond to it in his reply evidence;  
25 correct? That's the process?

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1 A. MR. FARQUHARSON: Yes, that's the process.  
 2 MS. OLENIUK: Okay. Thank you.  
 3 So, Chair, just in terms of process, I'm not sure  
 4 if now's the appropriate time before I move to  
 5 Dr. Barclay or if it's something you'd rather hear at  
 6 the end of our cross-examination, but I think you can  
 7 probably anticipate we're going to object to  
 8 Mr. Farquharson's evidence that he provided with  
 9 respect to this topic this morning.  
 10 If the OLG had wanted to challenge the higher PSL  
 11 for those four receptors, they had an opportunity to do  
 12 so, and as you heard from Mr. Farquharson, they didn't,  
 13 and this contravenes, of course, the Commission's  
 14 practice note on the use of aids, the practice note on  
 15 direct evidence, and our view is the Commission should  
 16 disregard Mr. Farquharson's evidence.  
 17 So I'm in your hands, sir, as to whether you want  
 18 to take that away and we continue or we deal with it  
 19 now.  
 20 THE CHAIR: Why don't I hear the position of  
 21 Ms. Okoye, and then we'll provide an opportunity for  
 22 your reply, and we can either rule on that now or  
 23 provide a ruling after -- after our lunch break.  
 24 MS. OKOYE: Just one moment, Mr. Chair. I'll  
 25 start off by saying Mr. Farquharson did note in his

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1 responses to Ms. Oleniuk's questions that it was an  
 2 oversight on his part. He would have brought that up  
 3 if he had dealt -- had some time to delve into the  
 4 highway traffic issue.  
 5 But I do note that in his report, that  
 6 Mr. Farquharson did not state that the NIA that was  
 7 done was compliant with the AUC Rule 12, and I'll say  
 8 that if -- given that there are some indications that  
 9 there are some issues that may make the amounts  
 10 presented in the NIA not to be accurate, my suggestion  
 11 will be that the Commission still considers it, even  
 12 though he didn't -- we didn't -- he didn't follow the  
 13 proper due process in bringing it up in his report, and  
 14 he has apologized for that oversight on his part.  
 15 THE CHAIR: Ms. Oleniuk?  
 16 MS. OLENIUK: Thank you, sir. I don't think any  
 17 of those submissions change our position, and while we  
 18 certainly appreciate Mr. Farquharson acknowledging his  
 19 oversight, it doesn't resolve the prejudice that would  
 20 be suffered by RES if this late information was adduced  
 21 without a proper opportunity for Mr. Faszler to respond  
 22 to it.  
 23 So our request that the Commission disregard the  
 24 evidence provided by Mr. Farquharson on this issue this  
 25 morning stands.

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1 THE CHAIR: Okay. One moment.  
 2 We're going to adjourn for 5 minutes, so we'll be  
 3 back -- we'll be back -- well, let's take 10 minutes.  
 4 So we'll be back at 10 after 11, okay?  
 5 (ADJOURNMENT)  
 6 THE CHAIR: We've considered the submissions  
 7 from counsel, and based on procedural fairness, we  
 8 agree with the applicant, and so that testimony from  
 9 Mr. Farquharson and -- that testimony from  
 10 Mr. Farquharson will be disregarded.  
 11 Continue with the cross-examination.  
 12 MS. OLENIUK: Thank you, Chair.  
 13 Q. MS. OLENIUK: And, Mr. Farquharson, I just  
 14 wanted to thank you for your candor in response to my  
 15 questions this morning. I appreciate that.  
 16 A. MR. FARQUHARSON: Thank you.  
 17 Q. Dr. Barclay, good morning.  
 18 A. DR. BARCLAY: Yes, good morning. We meet  
 19 again.  
 20 Q. We seem to meet like this quite often.  
 21 A. DR. BARCLAY: Yes.  
 22 Q. So I just have a few questions for you, sir. If we  
 23 could please pull up your opening statement, which is  
 24 Exhibit 140, Ms. Adebayo. And if we could turn to PDF  
 25 17, please. Thank you.

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1 So, Dr. Barclay, in your opening statement here at  
 2 PDF 17, you state that the high bat fatality rates at  
 3 the nearest operating wind facilities, being Lanfine  
 4 and Sharp Hills, despite the implementation of  
 5 operational mitigation at Sharp Hills suggests that the  
 6 fatality rate at the proposed Oyen project will also be  
 7 high; correct?  
 8 A. DR. BARCLAY: Correct.  
 9 Q. And if we can just go to PDF 14, please. At PDF 14  
 10 here, you note that the postconstruction mortality rate  
 11 at Lanfine is 4.2 bats per turbine; correct?  
 12 A. DR. BARCLAY: For all bats, yes.  
 13 Q. Yes, and 4.0 for migratory; correct?  
 14 A. DR. BARCLAY: Correct.  
 15 Q. And is it your understanding that Alberta Environment  
 16 and Protected Areas, or AEPA, has not currently  
 17 required operational mitigation for Lanfine?  
 18 A. DR. BARCLAY: I'm not aware whether it has or  
 19 has not been.  
 20 I'll also point out that the 2024 data that was  
 21 presented I didn't have access to at the time of  
 22 writing my report, and those 2024 migratory bat  
 23 fatalities at Lanfine were 4.8.  
 24 Q. Okay. And I think you said, sir, that you're not aware  
 25 if AEPA is requiring operational mitigation for Lanfine

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1 or not?  
 2 A. DR. BARCLAY: Yeah, I'm -- I don't know.  
 3 Q. Okay. If the operational mortality rate at the Oyen  
 4 project during its first year is more similar to  
 5 Lanfine in that it's near AEPA's acceptable threshold,  
 6 would you agree that it's possible that AEPA may not  
 7 require operational curtailment at all?  
 8 A. DR. BARCLAY: I suppose that's a possibility,  
 9 although the cumulative impact, I assume, would come  
 10 into play, and the cumulative impact of Sharp Hills,  
 11 Lanfine, and Oyen is well above the 500 migratory bat  
 12 fatality rate that they consider to be a concern.  
 13 Q. But you're not sure if it came into play for AEPA  
 14 currently as it relates to the 2023 and the 2024  
 15 results for Lanfine and Sharp Hills?  
 16 A. DR. BARCLAY: So Sharp Hills had mitigation in  
 17 place. I think that started during that first year of  
 18 operation, when they discovered that the bat fatality  
 19 rate seemed to be high early on in the monitoring  
 20 season.  
 21 I don't know whether AEPA has invoked the 500  
 22 cumulative number in terms of Lanfine and Sharp Hills.  
 23 Q. Okay. Thank you. If we can just go to PDF page 10 of  
 24 your opening statement. Thank you.  
 25 So on this map here that you've depicted, it shows

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1 the Lanfine project located directly south of the Oyen  
 2 project and Sharp Hills to the north; correct?  
 3 A. DR. BARCLAY: Correct.  
 4 Q. Okay. And based on that map, it looks like Lanfine  
 5 maybe is just slightly closer to the Oyen project than  
 6 Sharp Hills?  
 7 A. DR. BARCLAY: Yeah, the top end of Lanfine is  
 8 closer to Oyen than Sharp Hills, yes.  
 9 Q. And in your direct evidence this morning, you indicated  
 10 that you had the opportunity I think to either listen  
 11 to Ms. Sare's testimony yesterday, or you reviewed the  
 12 transcripts; is that correct?  
 13 A. DR. BARCLAY: Yes, I reviewed the transcripts.  
 14 Q. Do you recall her stating that one key difference  
 15 between the Lanfine and Sharp Hills sites is that Sharp  
 16 Hills partially overlaps with a high value landscape,  
 17 whereas Lanfine does not?  
 18 A. DR. BARCLAY: I don't recall that, but if you  
 19 say so, I will accept that.  
 20 Q. Okay.  
 21 A. DR. BARCLAY: My question is high value in terms  
 22 of migratory bats or bats in general?  
 23 Q. That was my question for you. If -- could we please  
 24 pull up the transcript. It might be helpful just to  
 25 see the quote in context, if that's available.

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1 And so I have it at page 37. I don't know what  
 2 the PDF number is it, unfortunately. Right there.  
 3 Perfect.  
 4 So that just starts at lines 6 to 14. So if you  
 5 want a moment just to review that.  
 6 A. DR. BARCLAY: So again, I'm not sure what "high  
 7 value landscape" is referring to. I believe, if I  
 8 recall correctly in the discussion, that's forested  
 9 areas or wetlands? Is that correct?  
 10 Q. I'm not sure. I don't think -- I don't think that -- I  
 11 don't -- I don't think so because I don't think Sharp  
 12 Hills is in a forested -- a forested area, but my  
 13 question -- and I think you may have already answered  
 14 this -- is in coming to your opinion on the -- your --  
 15 the potential for mortalities at the Oyen project, did  
 16 you consider the siting of the project in this respect,  
 17 with respect to the high value landscape?  
 18 A. DR. BARCLAY: No, I looked at the sites, the two  
 19 facilities north and south and looked at the average  
 20 fatality rate between those two.  
 21 Q. Okay. Thank you. We can take that down.  
 22 In your evidence -- I don't think we have to turn  
 23 this up -- but you posed the question of whether  
 24 preconstruction bat activity rates accurately predict  
 25 postconstruction fatality rates and wind turbines, and

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1 you refer to the Solick paper that found no evidence of  
 2 a correlation.  
 3 So, sir, is it fair to say that Lanfine and Sharp  
 4 Hills are a good example of this, given that Lanfine  
 5 had higher preconstruction recorded bat activity than  
 6 Sharp Hills, but fatality rates are three times lower  
 7 than Sharp Hills?  
 8 A. DR. BARCLAY: Yes, obviously there's not a  
 9 direct correlation, a one-to-one correlation. We do  
 10 have to keep in mind that that paper by Donald  
 11 Solick and others didn't consider variables that I  
 12 think are important; for example, the type of detector  
 13 used varies amongst projects, and those may detect more  
 14 or less bats.  
 15 Also, they measured the fatality rate in terms of  
 16 per megawatt production of the particular facility, and  
 17 different-sized turbines can have equal megawatt  
 18 capabilities, and size of turbines is important in  
 19 terms of the risk to bats. Taller turbines have a  
 20 higher risk.  
 21 So using megawatts as opposed to turbine size, for  
 22 example, might be important in looking at that  
 23 correlation between preconstruction activity and  
 24 postconstruction fatalities.  
 25 So to my mind, the paper certainly showed that

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1 there was not a correlation in the analysis that they  
2 did, but a number of variables I think could be added  
3 to that analysis to determine whether, in a more  
4 rigorous sense, there is that lack of strong  
5 correlation.

6 Q. Okay. Do you know, Dr. Barclay, if the bat detectors  
7 varied between Lanfine and Sharp Hills?

8 A. DR. BARCLAY: They were the same.

9 Q. Okay. And I understand based on the table that you  
10 provided in your opening statement at PDF 11 that  
11 Lanfine and Sharp Hills, while having a different  
12 number of turbines, the turbines have the same  
13 rotor-swept area?

14 A. DR. BARCLAY: And being old and not overly  
15 technically advanced, I'll use a paper copy. Where is  
16 that?

17 Q. So I have PDF 11. But I don't think there's paper --  
18 paper numbers on it. Page numbers.

19 A. DR. BARCLAY: Rotor diameter -- yeah, rotor  
20 diameter is the same at Lanfine and Sharp Hills at 150  
21 compared to the 170 metres at Oyen, at least the  
22 proposed turbines at Oyen.

23 Q. Yeah. And so the rotor-swept area for Lanfine and  
24 Sharp Hills is identical?

25 A. DR. BARCLAY: Correct.

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1 Q. Okay. Thank you. And would you also agree that  
2 there's the potential for variation for fatalities  
3 across turbines in a particular project?

4 A. DR. BARCLAY: Absolutely, yes. We certainly  
5 found that when we looked at fatality rates in the  
6 Pincher Creek area. And I will also say it'll vary  
7 from year to year, depending on weather and other  
8 factors.

9 Q. Would conducting one year of postconstruction  
10 monitoring and then determining whether operational  
11 mitigation is required provide a consistent approach  
12 and baseline data for AEPA in considering all wind  
13 projects in the Oyen area?

14 A. DR. BARCLAY: As I mentioned in my report, given  
15 the relatively high fatalities in the neighbouring  
16 facilities and AEPA's view of cumulative impacts, I  
17 think the costs of waiting for a year in terms of bat  
18 fatalities is greater than the cost of lower energy  
19 production, which as I've said is very minimal.

20 So I would -- as I did in my report, I would argue  
21 that mitigation should be in place from the get-go and  
22 see what it's like and then if, after that first year  
23 of mitigated operation, it is below a concerning level,  
24 then discussion can take place with AEPA about changing  
25 the mitigation or eliminating it.

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1 Q. How can the effectiveness of blanket curtailment be  
2 assessed if it's applied to all turbines at the outset  
3 of operations, and there's no baseline unmitigated data  
4 gathered?

5 A. DR. BARCLAY: You're right. If all turbines  
6 were mitigated, then you don't have a comparison within  
7 the same facility in the same year to determine how  
8 effective mitigation is.

9 I think there are enough studies that show that  
10 mitigation is highly effective, and I cited a number of  
11 those. So adding one more data point I don't think is  
12 as important as conserving the population of bats.

13 Q. If postconstruction monitoring for the first year of  
14 Oyen operation shows unacceptable mortality rates, is  
15 it your understanding that AEPA will require  
16 operational mitigation regardless of the project's risk  
17 ranking for bats or the preconstruction bat pass  
18 numbers?

19 A. DR. BARCLAY: Yes, that's my -- my  
20 understanding.

21 Q. Okay. And just one final question. Would your opinion  
22 on implementing operational mitigation from the get-go  
23 on this project be different if at the point when this  
24 project commences operation if the Sharp Hills numbers  
25 have been accepted to an acceptable limit?

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1 A. DR. BARCLAY: If they've been reduced to an  
2 acceptable limit using mitigation, my view would still  
3 be the same. Without mitigation, evidence suggests to  
4 me at least that the fatality rate at Oyen would be  
5 high, especially given the number of turbines involved.

6 So let's remember it's total number of bats that's  
7 a concern, not just the number per turbine. So if  
8 operational mitigation is changed for Lanfine and the  
9 numbers come down or at Sharp Hills and the numbers  
10 come down, great, but I would still recommend that  
11 operational mitigation be instituted at Oyen from  
12 the -- from the start.

13 MS. OLENIUK: Thank you, Dr. Barclay. Those are  
14 all the questions that I have.

15 A. DR. BARCLAY: Okay. Thank you very much.

16 **MS. BOUEY CROSS-EXAMINES THE PANEL:**

17 Q. Okay. We're going to change to some questions now for  
18 Dr. Bellut-Staeck. Can you hear me okay? I just  
19 switched my audio source.

20 A. DR. BELLUT-STAECK:(Through interpreter) Yes, I can  
21 hear you well.

22 Q. Right, thank you, and I understand that you obviously  
23 have an English language translator so if there is a  
24 question that you don't understand or if I'm speaking  
25 too quickly, please just let me know, and I can repeat

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1 that question for the translator, and I will do my best  
 2 to keep a slower pace.  
 3 A. DR. BELLUT-STAECK:(Through interpreter) Yes, I  
 4 understand.  
 5 Q. Wonderful. And will you require the translator for  
 6 every question?  
 7 A. DR. BELLUT-STAECK:Yes.  
 8 Q. Okay. I will start with some questions about the  
 9 professional qualifications and experience outlined in  
 10 Exhibit 107, if we can pull that up.  
 11 And to confirm, you prepared these responses,  
 12 Dr. Bellut-Staek?  
 13 A. DR. BELLUT-STAECK:Yes. (Through interpreter) Yes, I  
 14 have.  
 15 Q. And if we turn to PDF page 4, you list regular  
 16 university exchange with a number of professors with  
 17 the topic being possible infrasound effects on  
 18 biological systems.  
 19 A. DR. BELLUT-STAECK:(Through interpreter) Yes, I can  
 20 confirm that.  
 21 Q. And to confirm, you are not an adjunct or a full-time  
 22 professor at a university or other post-secondary  
 23 institution. Is that correct?  
 24 THE INTERPRETER: Would you like me to interpret  
 25 this part?

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1 A. DR. BELLUT-STAECK:No, excuse me. Yes (German  
 2 spoken). (Through interpreter) Yes, that's correct.  
 3 Q. And on the following page, if we scroll down, you note  
 4 that you are a member in the maritime working group for  
 5 the establishment of guidelines in cruise medicine.  
 6 Have you been involved in establishing any  
 7 guidelines for risk assessment or siting criteria  
 8 related to wind turbines for any government in any  
 9 jurisdiction?  
 10 A. DR. BELLUT-STAECK:(Through interpreter) No, so far,  
 11 I have not. I have specialized exclusively in the  
 12 research in this context. I would like to also make an  
 13 additional comment to that.  
 14 Q. Okay.  
 15 A. DR. BELLUT-STAECK:(Through interpreter) I would like  
 16 to just comment here that I have been working as a  
 17 scientific consultant for the last 6 years in the  
 18 German sound -- so I will just translate this  
 19 literally. The German Protection Society Against  
 20 Acoustic Injuries of Humans and animals, and there,  
 21 I've been working in an advisory function advising the  
 22 main members and working on developing  
 23 questionnaires -- question -- questionnaires and also  
 24 working on various symptoms, realizing what the  
 25 symptoms are and providing overviews on the infrasound

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1 aspects and illnesses in this regard.  
 2 So just to add another comment, that as part of my  
 3 function as part of this association, we also make  
 4 reports or consult vis-à-vis governmental bodies and  
 5 supervisory or regulatory bodies as well as ministries.  
 6 Q. Okay. Thank you. And, Dr. Bellut-Staek, I am going  
 7 to try to limit the amount of additional commentary  
 8 because we will encounter some time issues, given that  
 9 we have a translator involved as well.  
 10 So I appreciate the additional context, but going  
 11 forward, I'm going to try to limit the additional  
 12 commentary if possible to just respond to the question  
 13 that's asked.  
 14 A. DR. BELLUT-STAECK:(Through interpreter) Okay.  
 15 Q. So you mentioned the German Protection Society Against  
 16 Acoustic Injuries or something along those lines. Just  
 17 to confirm, this is not a government agency; correct?  
 18 A. DR. BELLUT-STAECK:(Through interpreter) Yes,  
 19 correct. It is a registered association which  
 20 corresponds to a nonprofit association.  
 21 Q. Thank you. I'm going to turn to some questions  
 22 regarding your evidence in the proceeding.  
 23 On a general level, my understanding is the  
 24 hypothesis put forward in your evidence is that  
 25 infrasound emitted from wind turbines can cause

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1 microcirculation disorders; is that correct?  
 2 A. DR. BELLUT-STAECK:(Through interpreter) Yes, that's  
 3 correct.  
 4 Q. And this is responsible for serious health effects for  
 5 those living in proximity to turbines, such as high  
 6 blood pressure, vascular diseases, heart attacks and  
 7 strokes; is that correct?  
 8 A. DR. BELLUT-STAECK:(Through interpreter) Yes, and it  
 9 is important to note that the stressors are not short  
 10 term, and they do lead to functional impairments, and  
 11 so, for example, if they're moving away from there and  
 12 then returning, it will still continue. So for  
 13 example, with headaches, tinnitus, longer-term impacts  
 14 in terms of cardiovascular diseases and so on.  
 15 Q. Okay. And this -- or your hypothesis is related to the  
 16 disruption of the PIEZO-1 channel embedded in the  
 17 membrane of the endothelial cell; is that correct?  
 18 THE INTERPRETER: I just asked if I may jump in to  
 19 interpret shorter segments for accuracy.  
 20 A. DR. BELLUT-STAECK:(Through interpreter) Yes, so this  
 21 is correct, and plus there is ongoing research that  
 22 there may be additional consequences of such kind of  
 23 activation of the PIEZO channel, and this may also lead  
 24 to additional diagnoses.  
 25 Q. So is your hypothesis regarding the impact or potential

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- 1 impact of infrasound from wind turbines supported by  
2 any cellular level model or laboratory testing?
- 3 A. DR. BELLUT-STAECK:(Through interpreter) Yes. This  
4 hypothesis is supported primarily from -- with studies  
5 from China. So these concern the impact of infrasound  
6 leading to sickening and additional fibroses at this  
7 level of the cell.
- 8 Q. And what is the level of infrasound included in those  
9 studies you're referring to?
- 10 A. DR. BELLUT-STAECK:(Through interpreter) I will look  
11 up the sources for a moment.
- 12 Q. My understanding is that those studies from China are  
13 based on exposure of infrasound at levels of 130 dB; is  
14 that correct?
- 15 A. DR. BELLUT-STAECK:(Through interpreter) I would have  
16 to verify, but I do realize that some higher levels  
17 were used.
- 18 So we also have the live situation, for example,  
19 in the nurse cohort study. So the impact of wind  
20 turbines on the rhythm and also the myocard changes, so  
21 the level there is between 70 to 80 dB of infrasound  
22 leading to changes at the cellular level.
- 23 Q. So to confirm, is it your understanding that levels of  
24 infrasound emitted from wind turbines is between 60 to  
25 70 dBG?

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- 1 A. DR. BELLUT-STAECK:(Through interpreter) So yes, I  
2 can confirm that, and also looking at systems like  
3 yesterday, mentioned in the testimony of Dr. Ollson,  
4 where we have the basis frequency of 0.6 hertz that  
5 would then lead -- have -- we have then a sound level  
6 that is the infrasound level between 60 to 90 dB.
- 7 Just to make a minor correction here is the SPL  
8 level of dB, which is under 1 hertz, and then leads to  
9 60 to 70 dBG.
- 10 Q. You understand that the ranges referred to in  
11 Dr. Ollson's testimony were for a distance of  
12 approximately 300 metres from a wind turbine; is  
13 that --
- 14 A. DR. BELLUT-STAECK:(Through interpreter) Yes, I  
15 remember the 300 metres being mentioned, but I don't  
16 know what findings he had with respect to that. So  
17 when we're talking about the 60 to 80 dB, it  
18 corresponds to a distance of up to 1,000 metres.
- 19 Q. It might help to pull up the relevant exhibit. If we  
20 turn to Exhibit 116 at PDF page 49. And you'll see the  
21 notation at the bottom of this graphic that says:  
22 (as read)
- 23 "Level range of the measured wind  
24 turbines, distance approximately  
25 300 metres."

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- 1 You see that there?
- 2 A. DR. BELLUT-STAECK:(Through interpreter) Yes, I see  
3 this, but it is a characteristic of infrasound that you  
4 don't have a lessening of the infrasound in this area  
5 but rather that in -- up to a distance of 1,000 metres,  
6 you still see certain dB values.
- 7 Q. Do you know the closest distance between a wind turbine  
8 and OLG member residences or your clients' residences?
- 9 A. DR. BELLUT-STAECK:(Through interpreter) Yes, I do.  
10 From what I remember, it is a distance of 850 metres.
- 11 Q. And on the basis of your hypothesis, what do you think  
12 is a safe setback from a wind turbine?
- 13 A. DR. BELLUT-STAECK:(Through interpreter) So I can  
14 mention here as I also mentioned in my evidence and  
15 based on the various studies cited there that a safe  
16 distance would be over 10 kilometres, given the size  
17 and the frequencies emitted.
- 18 Oh, sorry, I missed one part. I would like to  
19 cite a source for you. Just a moment. Under number 28  
20 in the literature cited, X0096.
- 21 So in this study by Stefan Garthe, et al, from  
22 Kiel, they were looking at large-scale effect of  
23 offshore turbines. I know that -- I realize that here  
24 we're looking at onshore turbines, but it was looking  
25 at the air infrasound effects on animals -- on birds

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- 1 and the bird population.
- 2 Q. And I'm wondering --
- 3 THE INTERPRETER: She's still continuing.
- 4 Q. I think that's okay for now. I think we can move on to  
5 the next question.
- 6 Are you familiar with the requirements of Alberta  
7 Utilities Commission Rule 12?
- 8 A. DR. BELLUT-STAECK:(Through interpreter) So I have  
9 this package in front of me here on Rule 12. It is an  
10 extensive package of requirements which deals with  
11 noise effect and is also -- includes possible updates  
12 or is available for possible updates, and in the  
13 current form as I see it here, it is only dealing with  
14 the audible part, therefore not dealing with the  
15 infrasound part and the infrasound effects.
- 16 So there is a section here on page 26 dealing with  
17 low frequency noise, but what is not being considered  
18 is infrasound as a physical energy and the scientific  
19 findings that relate to that that should also be  
20 considered now.
- 21 Q. I'm wondering if you are aware that a noise impact  
22 assessment was prepared for the project application in  
23 accordance with Rule 12.
- 24 A. DR. BELLUT-STAECK:(Through interpreter) Yes. I also  
25 know that infrasound in the overall assessment was

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1 the -- was not done on -- was not done on the C and A  
2 assessment. So when -- I was just citing from this  
3 that the measurements from this particular piece of  
4 writing, measurements must be conducted in both C and A  
5 weighting scales concurrently, but I know that the C  
6 and A weighting scales in terms of the distance results  
7 in more than 20.

8 So as I showed in my graphic, that the infrasound  
9 has to be -- we must continue to assess the infrasound  
10 without this kind of weighting.

11 Q. No, Dr. Bellut-Staeck, before you begin, sorry, this  
12 isn't actually related to my question. My question is,  
13 are you familiar with the noise impact assessment that  
14 was prepared for this project? There was a noise  
15 impact assessment filed for this project. I believe  
16 it's as Exhibit 12.

17 A. DR. BELLUT-STAECK:(Through interpreter) At the  
18 current time, I don't -- I'm not aware of the precise  
19 wording, but I would like to ask you to maybe pull it  
20 up and share the document.

21 Q. Sure. If you could pull up Exhibit 12, which is the  
22 noise impact assessment prepared for the project.

23 So to confirm, are you familiar with this exhibit  
24 and this assessment that was prepared for the project?

25 A. DR. BELLUT-STAECK:(Through interpreter) I recognize

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1 that, you know, is the current work that is actually  
2 ongoing in this area.

3 So in particular, the studies and the work that is  
4 being done from 2023 and 2024 that is already existing,  
5 so that is my research and then the confirmation from  
6 abroad, and it is probably the case that this hasn't  
7 not -- has not been received yet at the various  
8 jurisdictional levels.

9 Q. Okay. Thank you, Dr. Bellut-Staeck. That concludes my  
10 questioning, and thank you as well to your translator,  
11 Claudia. I appreciate your work today as well.

12 A. DR. BELLUT-STAECK:(Through interpreter) Thank you.

13 MS. BOUEY: And, Chair, that concludes our  
14 questioning for the OLG witness panel today.

15 THE CHAIR: Okay. Thank you. We'll break  
16 for lunch and we'll come back with questions from the  
17 Commission. Let's come back at quarter after 1,  
18 please.

19 (PROCEEDINGS ADJOURNED AT 12:09 P.M.)

21 PROCEEDINGS ADJOURNED TO 1:15 P.M.

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1 the title page, but I am not familiar with the current  
2 contents under this title.

3 Q. Okay. Thank you. And also just to confirm, are you  
4 aware that there is about a 25-year history of wind  
5 turbine development in Alberta?

6 A. DR. BELLUT-STAECK:(Through interpreter) Yes, I am  
7 familiar with this timeframe. It is similar to  
8 Germany, where one of the first wind turbines was  
9 created.

10 So yeah, from the start of the beginning of the  
11 wind turbines, when they were being constructed, the  
12 impact has to be seen differently now or assessed  
13 differently now also due to the size and all the  
14 different characteristics, in particular in respect to  
15 the depths of the frequency.

16 So this is the main critical point, really, is  
17 that the equipment or the turbines built back in 2010  
18 cannot be compared to the ones from 2025.

19 Q. So there has been a lot of evidence and testimony on  
20 the significant amount of research in this area. Are  
21 you aware of whether any jurisdiction around the globe  
22 has adopted a 10-kilometre setback on the basis of  
23 potential infrasound or noise impacts?

24 A. DR. BELLUT-STAECK:(Through interpreter) So I am not  
25 aware of this in detail, but I think the main reason is

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2 June 10, 2025  
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5 (PROCEEDINGS RESUMED AT 1:17 P.M.)

6 THE CHAIR: We'll now proceed to questions  
7 from the Commission. We'll begin with questions from  
8 Commission counsel.

9 **MS. GRAHAM QUESTIONS THE PANEL:**

10 Q. Thank you. My first questions are for  
11 Dr. Bellut-Staeck.

12 At PDF pages 11 and 12 of your evidence -- and  
13 I'll read a bit of it, so if I need to repeat it for  
14 the translator, please let me know: (as read)  
15 "At low frequencies, a reassessment and  
16 reevaluation of their effects on humans,  
17 animals, and plants is urgently needed  
18 to avert damage."

19 And you go on to recommend that appropriate precautions  
20 must be taken until all scientific questions have been  
21 definitively answered.

22 What are the appropriate precautions that you  
23 recommend the Commission take in relation to the  
24 project?

25 A. DR. BELLUT-STAECK:(Through interpreter) Yes, I can

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1 confirm, and with respect to these measures that could  
 2 be taken, first of all, the approval of additional  
 3 systems or equipment should wait until the scientific  
 4 evaluation has been completed.  
 5 Q. How long do you expect it to take for all scientific  
 6 questions on the topic to be definitively answered?  
 7 A. DR. BELLUT-STAECK:(Through interpreter) Okay. From  
 8 my side, I would say approximately 1 to 2 years because  
 9 the evidence is quite high, and I already made a  
 10 recommendation in my papers in terms of the direct  
 11 findings.  
 12 So the direct findings could be done in  
 13 conjunction as proposed with a direct examination of  
 14 the impact or influence of infrasound onto the  
 15 microcirculation.  
 16 So already -- I would like to continue here.  
 17 Already there are suitable studies that are existing  
 18 where, for example, in living tissues, for example, in  
 19 animal tests, we can see the influence or the impact  
 20 that can be determined.  
 21 Q. Would infrasound evaluation or monitoring be helpful  
 22 for the Commission's understanding of wind turbine  
 23 infrasound and health impacts?  
 24 A. DR. BELLUT-STAECK:(Through interpreter) Yes, I would  
 25 like to confirm that.

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1 Q. And if the Commission were interested in doing  
 2 infrasound monitoring, what methods and instruments  
 3 would you recommend?  
 4 THE INTERPRETER: I'm just saying I will jump in so  
 5 we can have shorter segments for accuracy of  
 6 interpretation.  
 7 A. DR. BELLUT-STAECK:(Through interpreter) And in terms  
 8 of the infrasound, I would recommend to conduct  
 9 unweighted dBZ measurements, and I will also quickly  
 10 mention -- I'll get back to that later -- that there  
 11 was a minor misunderstanding earlier before the break,  
 12 but I'll return to that later.  
 13 So in terms of those values that can be gathered,  
 14 so although certain studies exist, it is not  
 15 international really recognized yet or included yet  
 16 that in terms of the values that should be measured and  
 17 that is -- that is being recommended here, the values  
 18 should not just be measured outside of the houses or  
 19 the buildings but also inside because the values inside  
 20 tend to be higher.  
 21 Okay. So this is related to the possibility that  
 22 airborne infrasound and groundborne ultrasound can then  
 23 lead to resonancy within the buildings. So these can  
 24 lead to a decrease or also an increase of infrasound  
 25 load, and would in reality would then mean a higher

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1 impact in parts of the -- or some areas of the  
 2 protective areas of the houses, of the buildings.  
 3 So in this respect, I can cite a study from the  
 4 German Umweltbundesamt (indiscernible) federal office  
 5 of the environment out of the -- from the year 2014,  
 6 which is also cited in my paper, the study conducted by  
 7 Professor Krahe.  
 8 So it deals exactly with this development of the  
 9 resonancy and -- between the infrasound as well as the  
 10 bodily, body sound.  
 11 Q. Is there an acceptable limit for infrasound from wind  
 12 turbines considering human health?  
 13 A. DR. BELLUT-STAECK:(Through interpreter) In the  
 14 vicinity which is being impacted, there is no  
 15 possibility because their characteristics do not offer  
 16 such a possibility.  
 17 It can be only the distance that actually protects  
 18 human beings, and this distance should be investigated  
 19 in scientific examinations.  
 20 Q. Is there a way to screen out background infrasound  
 21 levels so that you could determine what's the  
 22 infrasound being caused by a turbine versus what  
 23 infrasound may be -- have other causes?  
 24 A. DR. BELLUT-STAECK:(Through interpreter) So yes, I  
 25 can confirm that. It is the specific profile that each

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1 turbine has. So this is what I was showing you earlier  
 2 in terms of the pulses emitted and that can be seen in  
 3 the sensoric information for the turbine.  
 4 Q. Thank you. I'm going to move on to questions for  
 5 Mr. Farquharson.  
 6 Given that RES committed that once the project  
 7 commences operation, in the event of noncompliance with  
 8 Rule 12, it will implement noise-reduced operating  
 9 modes for select turbines to reduce sound levels at  
 10 receptors, does that alleviate your concerns about  
 11 project compliance and noise mitigation?  
 12 A. MR. FARQUHARSON: Past history with the  
 13 noise-reduced operating modes indicates that they --  
 14 they should be sufficient in this case. It would be  
 15 good for the Commission and our clients to understand  
 16 what level of reduction was achieved from this.  
 17 So, you know, if we needed 1 dB, is somebody  
 18 willing to state that that's what the mode will  
 19 provide, versus just for a noise reduction mode and no  
 20 statement as to quantification of that value?  
 21 Q. Thank you. I'm going to move to some questions for  
 22 Dr. Barclay regarding bats.  
 23 Regarding migratory bat distribution, are there  
 24 pockets of increased density for these bat species  
 25 within their greater ranges?

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- 1 A. DR. BARCLAY: Ooh, there's a tricky question.  
 2 Because they're migratory, they come up in -- so  
 3 they're not here in the winter. Let's put it that way.  
 4 They're only here from sometime in May through into  
 5 September.  
 6 As they're migrating, the density will obviously  
 7 change geographically. During the time at which the  
 8 females are giving birth and the young are growing and  
 9 figuring out how to fly, they roost in trees.  
 10 So prairie, large scale areas of prairie, there  
 11 will not be a lot of them. They need trees for the  
 12 females and the young to roost in.  
 13 But otherwise, in Alberta, we find them into the  
 14 Rocky Mountains, into the Kananaskis area, for example.  
 15 We find them all the way up to northern Alberta. So  
 16 the only areas would be large-scale prairie treeless  
 17 areas that there would be few, if any, during the  
 18 midsummer period.  
 19 Q. The bat mitigation framework for wind power  
 20 developments recommends engagement with AEPA when bat  
 21 mortalities exceed 4 to 8 mortalities per turbine per  
 22 year.  
 23 Are there any other metrics that would be helpful  
 24 in assessing bat mortalities caused by turbines?  
 25 A. DR. BARCLAY: Not sure I fully understand. So

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- 1 the only metric -- the only measure of what the  
 2 fatalities are are the postconstruction fatality counts  
 3 using either people or people and dogs, for example.  
 4 Otherwise, I don't know of any other ways of measuring  
 5 the fatality levels at a particular wind facility, for  
 6 example.  
 7 Q. There are a number of factors that contribute to bat  
 8 population declines, including cumulative impacts and  
 9 slow reproductive rates.  
 10 Do you have any views on the contribution of  
 11 turbines to those declines relative to other factors?  
 12 A. DR. BARCLAY: Obviously climate change, change  
 13 in insect abundance, particularly nocturnal insect  
 14 abundance, have had impacts on birds, for example,  
 15 insect-eating birds. The change in insect abundance  
 16 will presumably have an effect on bats or is having an  
 17 effect on bats.  
 18 The fungal disease that I mentioned earlier today,  
 19 white nose syndrome, is the disease caused by a fungus,  
 20 it does not affect the migratory species. It affects  
 21 hibernating species of bats. So the three migratory  
 22 species, which are the ones most often killed by  
 23 turbines, are not impacted by that particular disease.  
 24 Q. So would you say turbines is one of the major  
 25 contributing causes or just a cause?

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- 1 A. DR. BARCLAY: I would say it's probably the  
 2 major cause of population declines.  
 3 Q. Given some of the factors we've discussed, the slow  
 4 reproductive rates for Alberta bats and the  
 5 international distribution ranges for some of Alberta's  
 6 migratory bat species, would there need to be an  
 7 international agreement, coordination, or action to  
 8 reduce the level of bat mortalities to a sustainable  
 9 level?  
 10 A. DR. BARCLAY: That's a very good point, because  
 11 obviously the bats moving through Alberta and wind  
 12 facilities in Alberta will also encounter wind  
 13 facilities in Montana and further south as they go to  
 14 the southern U.S. or even Mexico.  
 15 There are international groups looking at the  
 16 impact of wind energy in general continentally, but  
 17 there are no -- that I'm aware of, there are no  
 18 government or multigovernment international agreements  
 19 as to how to assess and mitigate fatalities of these  
 20 migratory species. So it would certainly be useful to  
 21 have that so that we could look continentally at what  
 22 the populations are likely doing given fatality rates  
 23 across the continent.  
 24 Q. You mentioned earlier today that studies indicate that  
 25 taller turbines kill more of each of the three

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- 1 migratory species of bats. Do you know if the taller  
 2 turbines are responsible for more mortalities because  
 3 they have a greater rotor-swept area, the height of the  
 4 blades is higher, or is there some other reason?  
 5 A. DR. BARCLAY: I'd say there are three reasons.  
 6 So tip height seems to be, from the studies that have  
 7 been done, an important contributor to the increasing  
 8 fatality rate. Another is how far off the ground the  
 9 blade spin comes. So the closer it is to the ground,  
 10 the more bat fatalities there are.  
 11 Size of the turbine is going to be obviously  
 12 important. The bigger the rotor-swept area, the bigger  
 13 the area that bats have to avoid. One thing we don't  
 14 know is whether bats are attracted to the turbines.  
 15 There's some evidence that suggests they are. Whether  
 16 different-sized turbines are more or less attractive,  
 17 as I have mentioned, these species are tree roosting,  
 18 and if they perceive that a turbine tower is a treelike  
 19 structure, they might be attracted to it looking for  
 20 somewhere to roost, and taller turbines might then be  
 21 more attractive. I don't know of any studies that have  
 22 tested those sorts of hypotheses.  
 23 Q. Given the mortality metric for curtailment in Alberta  
 24 is mortalities per turbine, as turbines get larger,  
 25 would the results be fewer bat mortalities per unit of

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1 energy?  
 2 A. DR. BARCLAY: So turbines have evolved to become  
 3 more efficient at low wind speeds, for example, so they  
 4 operate -- the blades spin at lower wind speeds than  
 5 they used to and produce energy. That would  
 6 potentially increase the fatality rate.  
 7 THE COURT REPORTER: Sorry to interrupt. I just got an  
 8 error on my software and I need to make sure  
 9 something's working here. Just had a thing that said  
 10 "out of memory" and then everything stopped.  
 11 THE CHAIR: Okay. We'll just stop, then, and  
 12 you let us know when you're able to continue.  
 13 THE COURT REPORTER: Thanks.  
 14 A. DR. BARCLAY: Doesn't sound good.  
 15 A. MR. WALLIS: At our age, Robert, that would be  
 16 our excuse.  
 17 A. DR. BARCLAY: I assume handwriting the comments  
 18 is not an option.  
 19 THE COURT REPORTER: No. Okay, it looks like we're  
 20 working again now.  
 21 THE CHAIR: Okay. Proceed.  
 22 Q. MS. GRAHAM: Would you like me to repeat the  
 23 question?  
 24 A. DR. BARCLAY: I was about to ask if you could do  
 25 that, Ms. Graham. Thank you.

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1 Q. Given the mortality metric for curtailment in Alberta  
 2 is mortalities per turbine, as turbines get larger,  
 3 would the results be fewer bat mortalities per unit of  
 4 energy?  
 5 A. DR. BARCLAY: I'm not sure I understand the  
 6 question.  
 7 So part of my answer would be as the Alberta  
 8 documents indicate, cumulative effects, not just the  
 9 per turbine number but the total numbers, either of a  
 10 particular facility or nearby facilities are also  
 11 considered to be important.  
 12 So if the question is should we be concerned with  
 13 the megawatts of energy produced per bat fatality, to  
 14 my mind, it's the total number of fatalities that's  
 15 important, and if bigger turbines kill the same number,  
 16 which they don't, as smaller turbines, then the output  
 17 of megawatts per bat fatality would go down. But those  
 18 bigger, taller turbines also kill more bats per year.  
 19 Q. You mentioned earlier that wind turbines were the  
 20 primary cause of migratory bat mortality. Do you know  
 21 if that applies to appropriately curtailed turbines, or  
 22 is it mostly in relation to turbines that lack  
 23 curtailment or are improperly curtailed?  
 24 A. DR. BARCLAY: So obviously there are natural --  
 25 what I'll call natural mortalities of bats. They hang

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1 in trees, and various sorts of predators can find them  
 2 and consume them. Accidents will happen.  
 3 And so fatalities at turbines, even when  
 4 curtailed, I would say, would be the biggest  
 5 contributor to mortalities that aren't, quote-unquote,  
 6 natural. I don't think we have a way of assessing what  
 7 the impact of climate change and reduced insect  
 8 abundance has on these species. They may be quite  
 9 significant, but I know of no metrics that would put  
 10 numbers on that.  
 11 MS. GRAHAM: Thank you, panel. Those are my  
 12 questions, Commission Chair, Commission Panel.  
 13 THE CHAIR: Ms. Slawinski?  
 14 MS. SLAWINSKI: Thank you, Chair.  
 15 **MS. SLAWINSKI QUESTIONS THE PANEL:**  
 16 Q. Good afternoon, panel. I have a few follow-up  
 17 questions for you, Dr. Barclay. I'll just let you keep  
 18 going.  
 19 A. DR. BARCLAY: Sure. Thank you.  
 20 Q. I wanted to ask you a bit about the 2013 directive and  
 21 the 500 bat per year cumulative number that we've been  
 22 talking about the last couple of days.  
 23 I was wondering, have you seen -- have you seen  
 24 that in action in the sense have you seen AEPa applying  
 25 that in various areas of the province, or?

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1 A. DR. BARCLAY: I can't recall having seen it  
 2 being put in -- into action, no.  
 3 Q. Do you know why that is?  
 4 A. DR. BARCLAY: I guess one answer would be the  
 5 sizes of wind facilities, i.e., the number of turbines  
 6 comes into play. Many of them have -- as listed in the  
 7 nearby ones from Oyen, most of them have relatively few  
 8 compared to the 83 proposed for Oyen turbines and thus  
 9 the total number of fatalities doesn't add up to 500 or  
 10 more.  
 11 And obviously, as the number of wind facilities  
 12 has increased in Alberta, the proximity of neighbouring  
 13 facilities becomes closer. There are good places for  
 14 wind energy because of the wind, and that may be  
 15 some -- so looking cumulatively across neighbouring  
 16 sites may be relatively new.  
 17 Q. Okay. Thank you for that. And so I guess what you're  
 18 saying, it's not really the number of projects, but it  
 19 could be the number of turbines that would trigger that  
 20 sort of an assessment and the resulting numbers that  
 21 would cause a -- cause the concern. Okay.  
 22 A. DR. BARCLAY: Correct.  
 23 Q. So it could be two projects. It doesn't necessarily  
 24 have to be three or four or some particular number.  
 25 A. DR. BARCLAY: No. As you say, it's the number

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1 of turbines and the mortality rate per turbine. And  
 2 obviously, a facility with 200 turbines, each killing  
 3 three bats, is going to be a concern given that  
 4 directive.

5 Q. Earlier, you averaged the postconstruction fatality  
 6 rates of the two projects to come up with a number. Do  
 7 you think that's an accurate estimate, or what would  
 8 you do to make that a more accurate estimate?

9 I mean, we -- keeping in mind that we talk about  
 10 how difficult it is to estimate anything when it comes  
 11 to --

12 A. DR. BARCLAY: Yes. I don't know. I mean, you  
 13 could say, well, maybe it's going to be the same as  
 14 Lanfine. What's the number going to be? Maybe it's  
 15 going to be the same as Sharp Hills. What's the number  
 16 going to be?

17 I think I took a more conservative approach and  
 18 said, well, we've got these two facilities, the  
 19 turbines are slightly different. They're in different  
 20 locations. Oyen's stuck in the middle. Let's say it's  
 21 at the average. I'm not sure how else to look at that,  
 22 I'm afraid.

23 Q. Could you think of any way to factor in, say,  
 24 geographic considerations?

25 A. DR. BARCLAY: So do you mean sort of landscape

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1 type --

2 Q. I guess so. I was looking for the term in my notes.  
 3 The high value habitats, for example, that we were  
 4 talking about earlier.

5 A. DR. BARCLAY: Yeah, and that's an issue.  
 6 Obviously these bats settle during the day in a tree,  
 7 and if that's -- if that's important in terms of their  
 8 risk of mortality at wind turbines, then looking at  
 9 whether there are lots of trees in an area might be  
 10 important.

11 One thing we don't know is what time of the night  
 12 these bats are killed because you go out during the  
 13 daytime to search under the turbines, and you find some  
 14 bats, and maybe they were killed while they were  
 15 finishing off their nightly migration and looking for a  
 16 tree to hang up in, or maybe they were killed in the  
 17 middle of the night as they're moving through the area,  
 18 and from what we know, and we don't know a lot about  
 19 the detailed routes that they take, they're flying over  
 20 all prairie. They're flying over forested area. They  
 21 tend to fly fairly high, from what we know, and it's  
 22 not as if they're following river courses or landscape  
 23 features that we might look at and say, oh, yeah, we  
 24 can paddle down that creek, or we can walk down that  
 25 trail. They're flying up high, basically over all

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1 sorts of different habitats.

2 And so I'm not sure that high value landscape  
 3 applies as much to these species as it does to the  
 4 smaller -- smaller species of bats that are here year  
 5 round and roost in trees or in caves or in buildings,  
 6 for example, and are feeding down low, looking for  
 7 insects often near water sources.

8 Q. Thank you, Dr. Barclay. That's really helpful. Let me  
 9 just check my notes and make sure I've got no further  
 10 questions.

11 A. DR. BARCLAY: Sure.

12 MS. SLAWINSKI: I think that's good for me. Thank  
 13 you very much, panel.

14 THE CHAIR: Thanks.

15 **THE CHAIR QUESTIONS THE PANEL:**

16 Q. Dr. Barclay, I want to continue on that line also just  
 17 so that I'm clear.

18 So if we could -- I think it's easiest if we bring  
 19 up your opening statement. I don't have that exhibit  
 20 number in front of me, but it's your slide  
 21 presentation. That's right.

22 Okay. And then if we can go, there's -- I'm  
 23 looking at a paper copy here, but there's a -- if you  
 24 scroll down, there's a slide that starts, it says  
 25 "cumulative impact on bats." That's where we are.

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1 Perfect.

2 So on this slide here, you're estimating that the  
 3 fatalities at Lanfine plus Sharp Hills is 1,107 bats  
 4 killed per year, and then just back to what  
 5 Commissioner Slawinski was referring to, and that is I  
 6 think just two slides prior, so if we just flip back  
 7 two slides. Correct.

8 So this is from the bat mitigation framework. And  
 9 it's total -- so annual total bat fatalities -- or,  
 10 sorry, fatalities at wind power developments in the  
 11 range of 500 bats per development per year, and what  
 12 essentially that says is that if that's the case, then,  
 13 you know, additional postconstruction mitigation may be  
 14 required by Alberta Environment or -- they were  
 15 referred to as ESRD at the time.

16 A. DR. BARCLAY: Right.

17 Q. And then if we flip back again -- so forward again two  
 18 slides, and we look -- so when I'm looking at that, it  
 19 looks like your position is that there's over a  
 20 thousand bats killed per year for Lanfine plus Sharp  
 21 Hills. So we're not even considering Oyen.

22 But that would be -- like, is that -- is it an  
 23 oversimplification to say that those are -- or at least  
 24 one of those would be above the 500 --

25 A. DR. BARCLAY: Sharp --

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1 Q. -- per development per year?  
 2 A. DR. BARCLAY: Sharp Hills, with 15.93 migratory  
 3 bats per turbine and 67 turbines, that's over a  
 4 thousand just at that one site. I assume -- although I  
 5 don't have documented evidence -- that the curtailment  
 6 implemented at Sharp Hills was due to early fatality  
 7 searches, and when a facility does fatality searches  
 8 and starts finding lots of bats, they also report that  
 9 to what was ESRD, AEPA, I guess, is now it. And that  
 10 presumably resulted in the discussion about  
 11 implementing turbine curtailment in that first -- first  
 12 year of operation.

13 So just Lanfine by itself is over the 500, and  
 14 then you add in the other two facilities, and we get up  
 15 close to 2,000.

16 Q. And are those numbers after the curtailment's been  
 17 implemented or before?

18 A. DR. BARCLAY: So the Lanfine, my understanding  
 19 is it was implemented partway through the season, once  
 20 they discovered high fatal -- sorry, at Sharp Hills. I  
 21 get the two mixed up.

22 So operational mitigation was implemented partway  
 23 through the season. I don't have it at my fingertips  
 24 exactly when that occurred. But let's say the fatality  
 25 rate would have been even higher without the

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1 information, and I think we need to work through it.  
 2 Dr. Barclay's is a classic because a lot of the issues,  
 3 there's overlapping issues that affect, you know,  
 4 things that I was talking about like birds.

5 So if you've got rotor-swept area right over  
 6 wetlands, you know, that's an issue. So you start to  
 7 go through all -- so what are the big issues, and, you  
 8 know, Ms. Sare and I can have a -- you know, go at --  
 9 you know, because she downplays, perhaps, something,  
 10 and she might have good evidence for that, so say,  
 11 yeah, that may be not the big issue; we've got to work  
 12 on these three big issues. These are where the  
 13 cumulative impacts, and we're already over the  
 14 threshold in some areas, maybe, or we have no  
 15 curtailment, we have no way of reducing these  
 16 fatalities, so a decision has to be made if, you know,  
 17 we want to preserve these species.

18 So you start going through these kinds of things  
 19 to trying and establish what those thresholds are or if  
 20 we've already surpassed them in some areas.

21 And that would apply to pronghorn, it would apply  
 22 to birds, and then you start looking at what are the  
 23 research gaps. You know, so we already know what we  
 24 don't know, and so those questions may need to be  
 25 answered before we can go further down the rabbit hole.

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1 implementation of curtailment.

2 Q. Okay. Thank you. We can bring this exhibit down.  
 3 That's very helpful. Thank you, Dr. Barclay.

4 Mr. Wallis, just have one question for you. I'll  
 5 just get my notes.

6 So I've asked you this question before in other  
 7 proceedings, but I just -- I would like your insight on  
 8 this again.

9 So you had mentioned as part of your evidence, you  
 10 know, a strong recommendation for the AUC to work with  
 11 AEPA to lay -- I'm just paraphrasing -- to lay the  
 12 groundwork for regional cumulative effects, and you  
 13 believe -- you referenced, you know, wetlands, birds,  
 14 bats, but can you -- can you elaborate on a mechanism  
 15 or how -- how that -- in your view, how that should be  
 16 done?

17 A. MR. WALLIS: Yeah, well, I think, you know,  
 18 there's enough experience with the various experts that  
 19 have appeared before you, combined with the expertise  
 20 within AEPA, to convene some sort of roundtable, but  
 21 they need a convening mechanism. Government is  
 22 stretched, let's put it that mildly, and you can see  
 23 that in the work that comes out or how slowly it comes  
 24 out sometimes.

25 But there's good people there with good

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1 But we're already at a concerning state, for  
 2 example, with the bats, and the birds declining now  
 3 in -- especially the grassland birds, you know, the  
 4 numbers, and my friend and I used to say if horned  
 5 larks start going down, then we're in real trouble.  
 6 Well, horned larks are one of those things that now  
 7 have suffered large decreases.

8 So, you know, every incremental impact becomes an  
 9 issue, and so what are the best ways to deal with that.

10 THE CHAIR: Okay. Thank you. Those are all  
 11 my questions. So I will turn it over to counsel for  
 12 the intervener to see if there is any redirect.

13 MS. OKOYE: Thank you, Mr. Chair. I do not  
 14 have any redirect for my witnesses.

15 MR. KEMA: I have just one for  
 16 Dr. Bellut-Staack.

17 THE CHAIR: Please proceed .

18 **MR. KEMA RE-EXAMINES THE PANEL:**

19 Q. Dr. Bellut-Staack, you mentioned there was an error in  
 20 the information provided during your cross-examination  
 21 before the break, and that you'd like to correct that  
 22 information. Can you please provide us additional  
 23 information on this?

24 THE INTERPRETER: May I just jump in to interpret  
 25 this part of what you had said, please?

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1 A. DR. BELLUT-STAECK:(Through interpreter) So during  
 2 the meeting, when we were previously talking about the  
 3 12 rule or guideline, a statement was made about dBG,  
 4 and what this should be. It is not dBG but it is  
 5 actually dBZ, which is unweighted, as it was mentioned.  
 6 Yes.  
 7 Q. Okay. Thank you very much, Dr. Bellut-Staeck. That's  
 8 all.  
 9 A. DR. BELLUT-STAECK:One moment. There was a second  
 10 little misunderstanding. When I was talking about .45  
 11 in low frequency noise, I wanted to explain that the  
 12 rule according to this low frequency noise means to  
 13 measure C-weighted and A-weighted and to look at the  
 14 difference, not the distance, the distance between the  
 15 C and A-weighted scales to detect if infrasound is  
 16 present.  
 17 So I realized that perhaps this was not in my  
 18 sense that there was a distance. No, it has to be the  
 19 difference between C and A-weighted scales about more  
 20 than 20 dB only indicate there is infrasound but do not  
 21 measure it in the real sound pressure level.  
 22 MR. KEMA: Thank you very much,  
 23 Dr. Bellut-Staeck.  
 24 Mr. Chair, that's all for me.  
 25 THE CHAIR: Okay. Thank you. So the panel is

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1 released from their oaths. They can step down.  
 2 (PANEL STANDS DOWN)  
 3 THE CHAIR: We will adjourn this part 1 of  
 4 this proceeding. We will continue with part 2 of  
 5 the -- this proceeding on July the 7th, beginning on  
 6 July the 7th, 2025, where we will hear from the OLG  
 7 landowners panel, and we'll also hear argument from  
 8 counsel for both parties.  
 9 So I don't -- I think we're good now, and we'll  
 10 close this part of the hearing. Have a good afternoon.  
 11 (PROCEEDINGS ADJOURNED AT 2:04 P.M.)  
 12 \_\_\_\_\_  
 13 PROCEEDINGS ADJOURNED TO JULY 7, 2025  
 14 \_\_\_\_\_  
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1 Certificate of Transcript  
 2  
 3 We, the undersigned, hereby certify that the foregoing  
 4 pages 219 to 317 are a complete and accurate transcript of  
 5 the proceedings taken down by us in shorthand and  
 6 transcribed from our shorthand notes to the best of our  
 7 skill and ability.  
 8 Dated at the City of Edmonton, Province of Alberta, on the  
 9 10th day of June, 2025.  
 10 \_\_\_\_\_  
 11 "Joanne Lawrence"  
 12 Joanne Lawrence, CSR(A), RPR  
 13 Official Court Reporter  
 14 \_\_\_\_\_  
 15 "Diana Halvorsen"  
 16 Diana Halvorsen, CSR(A), RPR  
 17 Official Court Reporter  
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