

COLES COUNTY PLANNING & DEVELOPMENT COMMITTEE
HEARING ON COLES WIND, LLC'S, APPLICATION TO CONSTRUCT AND
OPERATE A COMMERCIAL WIND ENERGY FACILITY (WIND FARM) UPON
CERTAIN PROPERTIES IN COLES COUNTY

APRIL 16, 2025
6:00 P.M. - 9:34 P.M.

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1 6:00 P.M.

2 MR. WATTS: Good evening. I am going to call the --
3 excuse me -- I am going to reconvene this meeting of the
4 Coles County Planning & Development Committee to consider
5 the license application from Apex Clean Energy for a WECS
6 system here in Coles County.

7 So, if we all rise, we can say the Pledge of
8 Allegiance.

9 (PLEDGE OF ALLEGIANCE.)

10 MR. WATTS: Now I will do the roll call:

11 Mike Clayton?

12 Darrell Cox?

13 MR. COX: Here.

14 MR. WATTS: Jeremy Doughty?

15 Ted Freezeland?

16 And I'm Mike Watts, Chairman Presiding.

17 And I'll now turn the meeting over to our hearing
18 facilitator, Scott Kains.

19 MR. KAINS: Thank you, Mr. Chairman.

20 And good evening, folks.

21 This is the sixth night of a public hearing
22 involving an application for conditional use by Coles
23 Wind, LLC.

24 When we met last night. We have some unfinished

1 business from a couple of witnesses last night.

2 First, a Mr. Ken Kaliski was testifying, and
3 because of the number of studies that he had referenced in
4 his testimony, Mr. Keyt had suggested that he have
5 additional time before cross-examining Mr. Kaliski about
6 his testimony and about these studies --

7 (JEREMY DOUGHTY JOINED PROCEEDINGS.)

8 MR. KAINS: -- I thought it was only fair that members
9 of the public had additional time to look at these studies
10 and formulate any cross-examination based upon that.

11 So we are back tonight, and -- oh, I see
12 Mr. Kaliski. I was looking over here, but he switched up
13 on me.

14 So, prior to Mr. Kaliski taking the stand,
15 preliminary matters, Mr. Hess?

16 MR. HESS: Thank you, Mr. Kains. We have two very
17 brief preliminary matters.

18 I believe Ms. Lode has the studies to hand out
19 from last night that were referenced and that did not get
20 printed.

21 And Ms. Shapiro has done the homework you gave
22 her as two proffers.

23 MR. KAINS: All right. Let's pass out those studies
24 that -- and I understand you don't always have the

1 ability, especially when you are practicing law on the
2 road, to be able to print everything. So, if you could,
3 just hand those out.

4 MR. HESS: Yes, sir.

5 MR. KAINS: And then we'll get to Ms. Shapiro's
6 homework.

7 MS. LODE: For the record, these are the 2015
8 Netherlands studies and the 2021 Finland study referenced
9 yesterday. They should also be available on the web page.

10 MR. KAINS: Okay. Mr. Lockhart?

11 MR. LOCKHART: Yes, sir.

12 MR. KAINS: Have all of these studies been put on the
13 website?

14 MR. LOCKHART: They have. They are with the Apex
15 Application about halfway down our homepage under Other
16 Documents. We've also put the hearing transcripts up
17 there as well as other relevant documentation.

18 MR. KAINS: All right. And let me make sure I've got
19 -- can you give the website just for everybody's
20 information, if you can?

21 MR. LOCKHART: We changed it. It's https dot -- or
22 slash www.ColesCo.Illinois.gov.

23 MR. KAINS: ColesCo dot -- the whole word Illinois?

24 MR. LOCKHART: Yes, the whole word.

1 MR. KAINS: Okay. ColesCo.Illinois.gov?

2 MR. LOCKHART: Correct.

3 MR. KAINS: And you said, on the website, it's about
4 halfway down?

5 MR. LOCKHART: Yes, on the home page.

6 MR. KAINS: Thank you, Mr. Lockhart.

7 Folks, Mr. Lockhart has done an amazing job
8 putting all this together. And in addition to getting
9 documents on the website, he also is instrumental in
10 getting with County Board members to schedule additional
11 hearing dates, and we have an announcement now with
12 respect to additional dates.

13 We are going to be here -- besides tonight, we
14 are going to be here tomorrow night from six until about
15 nine p.m., and then we will be back next Tuesday,
16 Wednesday, and Thursday, April 22, 23, and 24.

17 And it is our hope that, by the time we get to
18 next Thursday, the 24th, that we will be done with
19 evidence, testimony from everyone, public comment, and
20 perhaps even closing statements from counsel and closing
21 statements from interested parties.

22 And then there will have to be a couple of weeks
23 break for the court reporters to get transcripts done.

24 And, Mr. Lockhart, are there transcripts yet on

1 the website, or is that possible?

2 MR. LOCKHART: Just from March 19. That is the only
3 one we have so far.

4 MR. KAINS: But as soon as you get them, you'll put
5 them up?

6 MR. LOCKHART: They will be put up, yes.

7 MR. KAINS: Wonderful. Thank you.

8 And I think I've referenced in prior hearings, we
9 have Ms. Matthews tonight, Ms. Atkinson has been here some
10 as well, and they both are taking all of the testimony in
11 the Livingston County wind hearing that I am handling for
12 the county board up there. So, I am asking a lot of them.
13 And so thank you for your patience in not clamoring for
14 transcripts because they are getting them done as
15 expeditiously as possible.

16 All right. Last night I asked for some
17 additional information.

18 Ms. Shapiro -- let's see -- can you go ahead with
19 your -- do you have two proffers?

20 MS. SHAPIRO: Yes, I do.

21 MR. KAINS: Could you go ahead with your first one,
22 please?

23 MS. SHAPIRO: You asked us to research safety
24 specifics for Prosperity Wind.

1 MR. KAINS: I what?

2 MS. SHAPIRO: You asked us to research the safety
3 statistics for Prosperity Wind.

4 MR. KAINS: Safety statistics, yes.

5 MS. SHAPIRO: And we went back to when construction
6 started on February 1, 2024.

7 So there were 15 incidences requiring some type
8 of first aid, the majority of which were minor and did not
9 require any visits to medical facilities or lost work
10 time.

11 There were ten property damage instances. The
12 biggest issue is that we had vandalism on the site. So
13 some group of people had trespassed on the site and cut
14 hoses and cables and various other equipment.

15 To put the numbers into context, Prosperity Wind
16 has over 300 full-time construction workers. Prosperity
17 Wind has had 440 days of construction; that's from
18 February 1, 2024. So 440 days of construction, 300
19 full-time workers, 15 first aid instances, 10 property
20 damage incidences, which is all below average for
21 construction work.

22 Then operation: Our wind project's safety
23 statistics overall from January of 2024 to today, Apex,
24 the eight projects that we operate that have the 611

1 turbines that we mentioned last night, a total of work
2 time across the portfolio 237,637 hours of work, nine
3 incidences requiring first aid. Two were kind of serious.
4 One was heat exhaustion, and the other was a fractured leg
5 from a fall. Both individuals recovered. Twelve
6 incidences of property damage; it's unclear exactly what
7 it was but potentially similar to the one at Prosperity or
8 damage to property.

9 We also did the oil leaks because that came up
10 last night. Over the same time period, from January 2024
11 to today, for the 611 turbines that were operating, there
12 hasn't been a single instance of oil leak from an oil leak
13 external from a turbine. There have been two incidents of
14 small internal oil leaks inside the turbine. Each one was
15 less than three gallons. Each one was detected
16 immediately by onsite personnel and repaired.

17 Otherwise, that is it.

18 MR. KAINS: All right. And then, of course,
19 Mr. Conley testified last night to a death of a contractor
20 that, you know, I think everyone in the room is aware of.

21 MS. SHAPIRO: Correct.

22 MR. KAINS: But he was a contractor, concrete
23 contractor was my recollection. Is that correct?

24 MS. SHAPIRO: Yes.

1 MR. KAINS: And that seemed to be perhaps because the
2 worker was on his cell phone.

3 MS. SHAPIRO: That is what the evidence points to.

4 MR. KAINS: Okay. All right. Thank you for that.

5 Now, we are not going to open that up to
6 questions. That's just the research that Apex did.

7 So, yeah, there are things that happen on any
8 construction site, and so there's the answer to that with
9 respect to the Prosperity Wind project that is being
10 developed and is under construction at present in Piatt
11 County, Illinois.

12 All right. Second proffer? Oh, was that --

13 MS. SHAPIRO: They were combined.

14 MR. KAINS: Oh, okay. All right. Good. All right.

15 Then, Ms. Antonioli, you were asking questions
16 of Mr. Kaliski. Are you ready to proceed?

17 Or I guess I should say/ask if there are any
18 preliminary matters, besides what we have already gone
19 through?

20 MR. HESS: No.

21 MS. ANTONIOLLI: No, sir.

22 MR. KAINS: Also, Mr. Keyt and Ms. Rives, anything?

23 MR. KEYT: No, sir.

24 MR. KAINS: All right. Okay. Very good.

1 Ms. Antonioli, you can --

2 MS. ANTONIOLLI: We would like to recall Mr. Ken
3 Kaliski.

4 MR. KAINS: Okay.

5 MR. KALISKI: So I don't have to be sworn in again?

6 MR. KAINS: Just have a seat.

7 MR. KALISKI: Okay.

8 MR. KAINS: Mr. Kaliski, do you recall being sworn in
9 last night and promising to tell the truth?

10 MR. KALISKI: Yes.

11 MR. KAINS: Do you understand that you remain under
12 oath?

13 MR. KALISKI: Yes.

14 MR. KAINS: Very good. All right. We took a break
15 from questions from Mr. Kaliski for folks to have the
16 opportunity to review some of the academic reports, to
17 which he had testified.

18 We are in the midst of cross-examination.

19 We've already had questions from the committee
20 and from members of units of local government.

21 So we are now going to have questions from the
22 public, folks who are in opposition to the project, or
23 folks who are neutral. And after that, we will have
24 questions from Coles County staff and consultants, and

1 then there will be the opportunity for additional
2 questions, final questions from the zoning board.

3 All right. Questions for Mr. Kaliski first from
4 folks who are residents of Coles and Douglas Counties?

5 Ms. Pedigo, I saw your hand first to be follow by
6 Ms. Clark. It looks like she is your sidekick.

7 Are you guys friends?

8 MS. PEDIGO: Yes.

9 MR. KAINS: All right. Come forward, Ms. Pedigo.

10 Could you please state your name and spell it for
11 the court reporter?

12 MS. PEDIGO: Sure. Rhonda, spelled with an H,
13 R-h-o-n-d-a, and last name Pedigo, P-e-d-i-g-o.

14 MR. KAINS: All right. Go ahead with your questions
15 for Mr. Kaliski, please.

16 ***KENNETH KALISKI,***

17 a witness herein, called by the Applicant, after having
18 been previously duly sworn, was examined, and testified as
19 follows:

20 **EXAMINATION**

21 BY MS. PEDIGO:

22 **Q.** Thank you. My first question was: I've heard
23 annoyance, and it sounds like people feel like that is an
24 attitude. And I was just looking for your definition of

1 what annoyance is.

2 **A.** So, when we do our surveys, we ask people whether
3 they are highly annoyed by, in this case, shadow flicker,
4 wind turbines, or other things in their environment, and
5 how likely they are to be annoyed.

6 They might not be at all annoyed, moderately
7 annoyed, very annoyed.

8 And so, with respect to the definition of
9 annoyance in those studies, it's up to the individual
10 person to define for themselves whether or not they are
11 annoyed and how annoyed are they.

12 **Q.** Okay. So there is not a specific, like,
13 definition for it?

14 **A.** So we don't say annoyance is, and then how
15 annoyed are you? We leave it up to them to decide
16 themselves.

17 **Q.** Okay. All right. Thank you.

18 So my next question was: Are you aware that
19 chronic sources, like noise, can trigger a stress response
20 in the body, leading to elevated cortisol levels, and
21 stress hormones?

22 Such things as a noise annoyance has been linked
23 to those sort of issues/health concerns.

24 **A.** Yes. Link from noise exposure to annoyance, to

1 stress, cortisol levels, and so forth, that would be the
2 link to the health effect, yes.

3 Q. Okay. Thank you. And do you know, can
4 low-frequency sounds have negative effects?

5 A. Certainly, at high levels, they will have a
6 negative effect.

7 Q. High levels of?

8 A. Low-frequency sound would have a negative effect.
9 Just like the high-frequency sounds, but people tend to be
10 more sensitive to low-frequency sounds.

11 So they -- so, for example, in the IPCB
12 regulations, the standards, the nighttime standards, are
13 just above the audibility threshold as an example. So it
14 does tend to be in the IPCB standards that get regulated
15 more strictly.

16 Q. Okay. Thank you. Can infrasound penetrate
17 through noise-canceling earphones or behind walls and
18 windows?

19 A. Yes. Infrasound can go through walls, windows.
20 Typically noise canceling headsets aren't tuned
21 to that because there is not usually a lot of infrasound
22 to begin with.

23 We develop -- I was part of a research team to
24 develop a low-frequency noise headset that we use for the

1 military, and in that case we did address low-frequency
2 noise, and I think we even went into the infrasonic
3 region, but that was for jet fighters and people flying
4 M16s and so forth, very high level of frequency of sound,
5 infrasound.

6 Q. Okay. Do you know, are children more susceptible
7 of the high-frequency sounds?

8 And can these turbines emit this high-frequency
9 sound? And, if so, at what level?

10 A. Wind turbines really don't generate
11 high-frequency sound.

12 If you look at Table 2 in our report, you know,
13 for example, that 8,000 hertz, I showed that the wind
14 turbine sound level was at zero. It was probably lower
15 than zero, but we just essentially said zero because --

16 Q. Sure.

17 A. -- there are two factors. Even if it emitted
18 high-frequency sound, high-frequency sound is absorbed
19 very readily in the atmosphere.

20 So the attenuation of high-frequency sound, the
21 distance is much higher than low-frequency and
22 mid-frequency sound.

23 So the high-frequency sound doesn't travel far.
24 And wind turbines, aerodynamic sound from turbines doesn't

1 generate a lot of low-frequency sound -- sorry --
2 high-frequency sound.

3 Q. High-frequency sound, okay.

4 Do you know if children, or babies, are more
5 vulnerable to -- I am sorry -- I am asking that wrong.

6 Are babies more vulnerable to hearing damage than
7 adults or children?

8 A. I don't know that.

9 Q. Okay. That's outside of your scope?

10 A. Yes.

11 Q. Okay. All right. The only other thing I wanted
12 to ask was: If I was understanding correctly, you
13 mentioned something around 41 decibels.

14 And, like, my speech, just talking to you, if we
15 are sitting on the couch together, if just talking, might
16 it be around that if we were talking softly? Is that
17 correct?

18 A. I said in conversational speech it is around 55
19 or 65.

20 Q. If I was talking softly, like, not a whisper,
21 but, you know?

22 A. I don't know that I'd hear you very readily if
23 you were talking at 41.

24 So, you know, typically the background sound

1 within a library, they are probably between this and when
2 the air-conditioning was on -- this is just a guess -- is
3 about 39, 40 decibels. So it would be pretty quiet.

4 Q. More like a whisper than --

5 A. Yes. I think so.

6 Q. So, if I spoke like this to my husband all night,
7 do you think that would affect his sleep?

8 A. I don't know.

9 Q. Okay. Thank you for your time.

10 MR. KAINS: Thank you for your questions, Ms. Pedigo.

11 Ms. Clark? Could you please state your name for
12 the court reporter, please?

13 MS. CLARK: Kelly Clark.

14 MR. KAINS: Ms. Clark, do you need to move the
15 microphone down? It looks like you are standing on
16 tiptoes.

17 MS. CLARK: I am.

18 MR. KAINS: You don't need to do that.

19 EXAMINATION

20 BY MS. CLARK:

21 Q. I am going about it the wrong way. I sat down
22 last night and wrote this all down as I was thinking.

23 In 2018, there was a review by a James Husky
24 Phillips that talks about evidence found where the turbine

1 noise can lead to sleep disruption, annoyance, which we
2 talked about, or psychological distress in some cases.
3 They say this is especially true for closer residents.

4 In your opinion, what would you consider length
5 wise as a closer -- if it is going to affect somebody,
6 what would you consider closer length wise? A mile? Two
7 miles?

8 A. So, I rarely look at distance because distance
9 doesn't have a whole lot to do with the sound level.

10 Q. Okay.

11 A. And that's because different turbines have
12 different sound levels. If you have a single turbine, or
13 you have two turbines, or three turbines, or you are
14 surrounded by turbines, all of that will affect the sound
15 level. So rarely do I look at distance as a driver of
16 annoyance or any other type of effect.

17 Q. They wouldn't make it, like, noisier or lower?

18 I guess I don't understand that.

19 Because you would think if you were closer that
20 it would make it noisier than if you are farther away. I
21 don't know, but I would just assume that.

22 A. Right. But let's say you are at home and you
23 have one turbine at, say, 2,000 meters away, and the sound
24 level is 45. I am just throwing that out there.

1 Q. Oh, yeah. I get you.

2 A. You have another turbine 2,000 meters to the
3 north, and another turbine 2,000 meters to the east, or
4 west, and another 2,000 to the south. Now, you have four
5 turbines within the same distance. The distance hasn't
6 changed, but now you have -- double it, three -- so that
7 is a six-decibel increase in the sound.

8 So the distance doesn't have a whole lot to do
9 with what sound you are exposed to. It matters more like
10 how close you are to multiple turbines and how they
11 contribute to sound.

12 Q. Okay.

13 A. And then, if you have other turbines around, they
14 all contribute.

15 And when we do our studies, we look at all of the
16 turbines within ten kilometers of a residence and how it
17 contributes to the sound at that residence.

18 Q. Okay. I get that. That actually goes to a
19 question I have a little bit later.

20 But last night, when we were talking, you were
21 talking about decibels and noise causing vibrations. Did
22 you say it was around 70 that they usually start causing
23 vibrations?

24 A. At 31.5 hertz, yeah. 70 decibels. I am sorry.

1 **Yeah, 70 decibels.**

2 **Q.** All right.

3 **A.** It would likely have a noise-induced vibration
4 **effect.**

5 **Q.** Okay.

6 **A.** And that's if it was 70 decibels inside a home.

7 **Q.** Okay. So you also say that the wind turbines,
8 they were 41 or lower, right?

9 Like, I think you said two of them were 41. Most
10 of the rest were going to be, like, lower decibels than
11 that, right?

12 **A.** Just so we are talking apples and oranges, the 41
13 is at 1,000 hertz.

14 **Q.** Okay.

15 **A.** But at the 31.5 hertz, which has the 70-decibel
16 threshold, that was higher. That was -- I believe it was
17 63 decibels. That's in Table 2. Yeah. The highest sound
18 level at a receptor, at a home, at 31.5 hertz, was
19 63 decibels. That was the Vestas turbine.

20 **Q.** Okay. So when we were talking, about a minute
21 ago, say, at my house there is going to be four of them.
22 So does that mean you take -- if you are saying that the
23 decibel -- say it's 40, just to make it easy -- say it's
24 40 decibels that you are supposedly hearing them. Does

1 that mean you are going to have 160 by the time you times
2 it by four because you've got four of them around there?

3 A. Right. So I am going to go slightly into decibel
4 math. Bear with me. So, remember, I said the one turbine
5 was at 45.

6 Q. Okay.

7 A. And the four turbines added 6 decibels. So here
8 is how that works: If you double the number of sources at
9 equal distance, you would add 3 decibels.

10 If you -- so I am going from 1 to 2. That adds
11 3 decibels. I go from 2 to 4, another doubling; that adds
12 3 decibels.

13 So, if you have 4 sources around you at the same
14 distance, it would be about 6 decibels, 2 doublings;
15 3 decibels for each doubling.

16 Q. All right. Okay.

17 A. And this is because the decibel scale, it's
18 logarithmic. So, the math isn't easy.

19 Q. I was going to say I don't understand all of
20 that. So that does not make any sense to me. You would
21 think if you have 1 and add 3 more it is going to be a lot
22 louder.

23 A. Right.

24 Q. But if you are saying -- I don't know. Okay.

1 Then, so say that, like you said, say it's
2 45 decibels for that one turbine. Is that with the
3 windows closed or open?

4 Because then, like, in the summertime, or spring
5 and fall, when I have my windows open all of the time, so
6 we are not running the furnace or air conditioner, or
7 whatever, all the time, is your decibels going to increase
8 because you've got the windows open, so you don't have
9 that barrier?

10 A. Right. Right. So -- so I just want to get back
11 to your first question and whether the sound levels are
12 additive.

13 In the model that we do, all the calculations
14 were added at 40. So that 41 decibels, for example, at
15 1,000 hertz, that includes every turbine in the project
16 added together at that one location.

17 And getting back to your second question, which
18 was -- sorry. I lost track. What was your second
19 question?

20 Q. Well, I was saying -- I mean, because, like, in
21 the spring and fall, I have my windows open all the time.

22 A. Okay. So the sound levels that we are modeling
23 are measured outside the house. The average -- so the
24 sound from the outside to the inside is what we can

1 attenuate. It's reduced because of the walls and sides
2 and the windows. It's not a -- you are not sleeping
3 outside, in other words.

4 So the EPA average sound level attenuation for a
5 home in a cold climate is about 18 decibels with the
6 windows open and somewhere around 25 decibels with the
7 windows closed. It ranges, generally, between 12 and 18.
8 But there certainly is attenuation from the outside to
9 inside.

10 Q. Okay. Because I actually have a decibel meter at
11 home, and since this has all come up, I've actually, like,
12 went around the house doing different things, turning it
13 off and on.

14 Like you said, most of the time it's going from,
15 like, 65 to 75. If I've got the TV on, my dogs are
16 barking, and whatever the heck is going on.

17 So does that mean -- okay.

18 So, if you've got a regular decibel level in your
19 house of, like, 70, say, and then you add these turbines,
20 and the noise from the turbines, and, say, we'll use the
21 40 marker decibel. So then you are going to go up from 70
22 to 110, right?

23 Or how does that work?

24 Does that work differently then?

1 A. I am going to get into some more decibel math
2 that you are not going to like.

3 Q. Probably not.

4 A. 70 decibels plus 40 decibels is 70 decibels. So,
5 if the difference between the decibel levels are more than
6 10, they are not added at all.

7 So, as I mentioned, you know, 40 plus 40 is 43.
8 40 plus 50 is 50. 40 plus 70 is 70. So the lower sound
9 level doesn't add anything to the higher sound level.

10 Q. Okay.

11 A. And, again, it's because of the fact that a
12 decibel is a log, and 40 decibels is actually, in terms of
13 the pressure, is actually much higher in terms of the
14 intensity than 40 decibels is.

15 So when you add that much, much higher sound
16 level to something that is very little, the difference is
17 negligible.

18 Q. So, basically, you are saying -- and I am not
19 meaning it mean or anything. So, basically, you are
20 saying what I am hearing in my house, I am not going to
21 hear any different because that is a lower decibel than
22 what is in my house? Is that what I am getting from it?

23 A. If the sound level is more than 10 decibels
24 different it won't add to the sound. I am not going to

1 say you are not going to hear it. I never say you are not
2 going to hear something because -- we are just talking
3 about decibel levels here -- you know, the frequency could
4 be slightly different, so you might pick up a slightly
5 different frequency from the sound even though it's much
6 lower.

7 I could hear backup alarms because it's a very
8 distinct pitch a long way away, even though the sound
9 level isn't very high.

10 But the fact the wind turbines and wind-induced
11 sound are very similar, obviously, because wind turbines
12 generate sound through aerodynamic action, as does wind
13 blowing around the house with grass and so forth, the
14 spectrums are the same.

15 But, nevertheless, you might be able to hear it;
16 probably not if the house -- I would have to say, if the
17 sound level in the house is about 70, and it's 41 decibels
18 outside, I am pretty sure you won't hear that.

19 Q. Even with the windows open?

20 A. Yeah. But -- yes. But, nevertheless, I just
21 don't like talking about audibility because I don't know
22 how good your hearing is. I don't know how the background
23 changes and so forth.

24 But I can tell you that, yeah, in terms of

1 decibels, there is no impact from 40 plus 70.

2 Q. Okay. Well, that kind of goes -- okay. That
3 kind of goes into my next question.

4 So you say that the sound level tends to be
5 higher at night than during the day, right?

6 Is that the way I took it last night when you
7 were saying the noise level would be --

8 A. Yeah. The sound levels from the wind turbines
9 tend to be higher at night than during the day.

10 Q. Well, okay.

11 A. But the sound --

12 Q. So, if you are trying to sleep, and things are
13 quiet, and the noise level of the turbines is higher, then
14 doesn't that mean you are going to hear them more at night
15 than you would when things are drowning them out during
16 the day, when your usual house level is drowning them out
17 during the day?

18 A. So, there's two things there. The turbines tend
19 to be more audible at night; that is true. The background
20 sounds are lower. There is not as much going on. But, at
21 the same time, the standards for wind turbines and
22 everything else in Illinois is also more strict at night.

23 So, you know, the IPCB regulations recognize that
24 you want to protect the nighttime environment more than

1 the daytime, when you are doing things, and you may not
2 notice it.

3 So they are intended to address that issue where
4 -- and I am not -- again, I am not talking about
5 audibility, but --

6 So, in this case, of course, the turbines are
7 going to be kept at the same standard for the daytime and
8 nighttime; but yeah, if you were outside, it would
9 probably be more loud.

10 Q. Well, because I am thinking of the fact that when
11 I was talking about the windows open; you know, that's one
12 of the great things about living in the country,
13 especially at the right time of year when you can have the
14 windows open, and the crickets are making their noise, and
15 you are sleeping, and it makes you sleep good.

16 But then you are going to have wind turbines. Is
17 that going to -- I mean are you going to tell me you are
18 not going to hear those, or you are going to hear those
19 when you are trying to sleep?

20 A. Yeah, and I am not going to say whether or not
21 you can hear them or not. I just can't tell you whether
22 or not that is the case.

23 In most cases, people don't hear the wind
24 turbines inside their homes. That's the survey that we

1 **did.**

2 **Q.** Okay.

3 **A.** **But I can't guarantee that.**

4 **Q.** Okay. You talked about a lawnmower being, like,
5 90 decibels, right?

6 **A.** **Yes.**

7 **Q.** Is that what you are -- so at 90 decibels, if you
8 have a lawnmower going all the time around your house, I
9 mean it would get annoying, right?

10 I mean, for most people, that would be annoying,
11 right?

12 **A.** Well, if it was your lawnmower, you probably
13 wouldn't be annoyed because you know your lawn is getting
14 cut. But if it was your neighbor's lawnmower, maybe it
15 would be.

16 **Q.** Okay.

17 **A.** But in that example --

18 Go ahead with your question.

19 **Q.** Okay. So, then we were talking, and you stated
20 basically annoyance can lead to stress, or stress can lead
21 to health effects, which health effects can lead to
22 disease.

23 But as we -- I don't remember her name, this lady
24 here -- and Mr. Runner, I think his name was, the expert,

1 said that there is no health issues that was noticed.

2 But it also stated that, if a lawnmower is going
3 to be annoying or -- how do you put it? -- anything to
4 that, then why wouldn't that noise be annoying where there
5 may be a possibility -- I am not saying that maybe there
6 hasn't been, but there also -- the data on this hasn't
7 been long enough.

8 But is there not -- that it can -- that it could
9 possibly lead to health effects?

10 A. This has been -- wind turbines have been studied
11 for -- I don't know -- I mean the first studies were by
12 NASA in the 1980s, and the first-dose response studies
13 were, I believe, around 1999ish. So this has been
14 studied.

15 And I think, if you look at the literature, the
16 peer-viewed literature, I think there's fairly consistent
17 evidence that the wind turbines, at the levels that we are
18 talking about here, not any different wind farm somewhere
19 else, you know, the sound levels are going to be under the
20 IPCB limits, that there would be no adverse health effects
21 based on the population studies.

22 I can't promise every individual, or I don't know
23 what everybody's individual status is, and I am not a
24 doctor. So just saying, based on the literature, there is

1 no association between the wind turbine sound and health
2 effects.

3 Q. Okay. The last thing is one thing -- I think
4 there is one last thing I wanted you to explain. You said
5 -- I didn't actually understand.

6 You said the larger turbines -- because these
7 ones are larger than the other ones we talked about --
8 produce more electricity and more sound level, but overall
9 their noise is lower. How is that?

10 A. Right. So, whenever I talked about if you are
11 surrounded by four turbines, you know, it would be
12 6 decibels higher, well, if each turbine generated twice
13 as much electricity -- so you only needed two of them --
14 so you would be going from four turbines down to two; that
15 would be a drop of 3 decibels. You are generating the
16 same amount of electricity, but since there are fewer of
17 them, the overall sound level drops.

18 And that's essentially what's happening -- what
19 happens with the study. Where you have the taller
20 turbines, they can capture more energy because they are
21 taller and have a bigger rotor diameter, so you don't need
22 as many.

23 They need a larger setback because, like I said,
24 the setback distance is a function of tip height.

1 They are a little bit louder, but the fact that
2 there is fewer of them, essentially, offsets the fact that
3 they are a little bit louder.

4 Q. Okay.

5 A. So the louder -- they generate more sound, but
6 there are fewer of them.

7 Q. Okay. Well, okay then. I do have something
8 else.

9 In the shadow flicker -- there's a 2018 review
10 that I read where it talked about disrupting sleep
11 patterns because it can interfere with the sleep/wake
12 cycle, okay?

13 Is that a possibility?

14 Because, like, I know at my house I have to -- I
15 can't go to sleep in the pitch dark. But my husband, it's
16 got to be dark.

17 So, if you are having those lights come on and
18 off, or you are having the shadow, either (1) flicker --
19 because my husband goes to sleep at like seven o'clock at
20 night because he gets up at four o'clock in the morning
21 and leaves.

22 So if you are having the shadow flicker, or the
23 lights, and you are getting a sleep disruption, is that
24 not going to -- you don't -- is that not going to have a

1 possibility on your health effects?

2 A. I haven't read that same thing.

3 And I could only imagine -- maybe I am
4 speculating here, which I probably shouldn't do -- but
5 that it could wake you up; but the fact is that the shadow
6 flicker only occurs for a short amount of time over a
7 short amount of time during the year.

8 So where you get problems with sleep disturbance
9 causing health effects is if this is something that
10 happens all the time and you chronically can't sleep.

11 So, again, I don't know the study, and I don't
12 know the situation, and I can't tell you if somebody is
13 going to wake up or not, but I think that's why we don't
14 see it in the literature, is because it is not a chronic
15 effect.

16 Q. Okay. All right. I think that is it. Thank
17 you.

18 MR. KAINS: Very good, Ms. Clark. Thank you for your
19 questions.

20 Any other questions for Mr. Kaliski?

21 Yes, Mr. Borgman?

22 And then Mr. Sherman.

23 Could you state your name for the court reporter.

24 MR. BORGMAN: Phil Borgman, B-o-r-g-m-a-n.

1 MR. KAINS: Go right ahead, Mr. Borgman.

2 EXAMINATION

3 BY MR. BORGMAN:

4 Q. Mr. Kaliski, last night you said a couple of
5 times that you are not an audiologist.

6 Would an audiologist look at things differently
7 in terms of the way that sound causes things to happen in
8 the human body?

9 A. Well, different than what? Different than --

10 Q. An engineer tends to view sounds differently than
11 an audiologist.

12 A. Well, an audiologist specifically looks at the
13 effect to the ear.

14 Q. So infrasound, the sound that we cannot perceive,
15 has been shown to cause physical effects.

16 Have you read any reports reflecting those views?

17 A. Yes. NASA did a number of studies way back, I
18 think, dating back even at least to the '60s to maybe the
19 '80s, looking at infrasound and effects because they were
20 concerned about space light and how it would affect
21 people.

22 There were also the original wind turbines, where
23 what we call downwind wind turbines, where the blades were
24 down into the towers. And so -- I am going to use an

1 example.

2 It's not -- I am sorry, it's not on the record.

3 If but my water bottle is the tower, and this pen
4 is the blade -- whoops -- and the wind is coming from this
5 direction, every time the wind passes the blade, it
6 creates a lower pressure zone, and so the interaction with
7 the tower, you get a thumping sound, and that thumping
8 sound creates a lot of infrasound.

9 I am sorry. It's the other way around, but it's
10 the -- sorry -- the turbine, the blades are downwind. So
11 every time the wind hits the blade, the low pressure area
12 behind the tower creates a stall in the blade, and that
13 creates this high-sound level as the blade passes the
14 tower.

15 The opposite is not true. When the turbines are
16 upwind, when the blades are upwind of the tower, you don't
17 get that low-frequency sound. You don't get that
18 infrasound.

19 So NASA, in the early years, was concerned about
20 the infrasound effects of the original turbines. And ever
21 since then, after that terrible experience, that
22 infrasound in those turbines, the blades are now all
23 upwind of the towers.

24 MR. KAINS: The blades are what?

1 THE WITNESS: Upwind of the towers.

2 MR. KAINS: So they are not downwind and thumping?

3 THE WITNESS: If they are not downwind, they don't
4 cause thumping. They are upwind, facing wind, so the wind
5 hits the blades without any, you know -- fairly
6 consistently without any low pressure areas.

7 BY MR. BORGMAN:

8 Q. So is there a level of infrasound that comes off
9 of these proposed turbines that Apex will be using for
10 these wind turbines?

11 A. Yes. All wind turbines generate some amount of
12 infrasound.

13 Q. Are you aware that low-frequency noise can affect
14 the balance system of the ear leading to a range of
15 symptoms, including nausea, dizziness, visual problems?

16 It's not perceivable to the ear, but it is
17 perceptible to the human body.

18 A. At high levels of infrasound, that is the case;
19 but the wind turbines don't generate those high levels of
20 infrasound.

21 Q. Okay. Last night you stated, and the reports
22 said it, that were submitted, that are on the website,
23 there wasn't any diseases that have been linked to wind
24 turbines.

1 But are you aware that there are syndromes?

2 And they call it vibroacoustic disease, but it's
3 a condition. Are you aware of those, wind turbine
4 syndrome, or vibroacoustic disease?

5 **A. Yes, I've heard of that; but, again, they are not**
6 **diseases. They are not classified as diseases.**

7 **Q.** They are not classified as diseases, but they are
8 conditions that have symptoms such as slight mood swings,
9 indigestion, heartburn, mouth and throat infection, and
10 bronchitis at Stage 1, and that is exposure from 1 to
11 4 years.

12 Stage 2 was: Moderate signs, 4 to 10 years,
13 depression, aggressiveness, pericardial thickening, light
14 to moderate hearing impairment, chest pains --

15 **MR. KAINS:** You are going way too fast. Ms. Matthews
16 is doing her best, but you need to slow down. Back up a
17 couple of lines.

18 **BY MR. BORGMAN:**

19 **Q.** So my question is: There are three stages, and
20 are you aware of the three stages that they are saying go
21 along with the vibroacoustic disease?

22 **A. No.**

23 **Q.** Okay. So Stage 2 is 4 to 10 years of exposure of
24 wind turbines that leads to depression, aggressiveness,

1 pericardial thickening, light to moderate hearing
2 impairment, chest pain --

3 MR. KAINS: Hang on, Mr. Borgman.

4 You have an objection, counsel?

5 MS. ANTONIOLLI: Yeah. He just testified he is not
6 aware of the three phases, and he's going on and talking
7 about them.

8 MR. KAINS: Okay. Mr. Borgman, what are you reading
9 from? What is this?

10 MR. BORGMAN: This is another Canadian report,
11 whenever you cut me short then. Not you but --

12 MR. KAINS: We don't mean to cut you short, but there
13 is a time for testimony, and there is a time for
14 questions.

15 MR. BORGMAN: This is our health witness.

16 MR. KAINS: Right. And I want you to ask him a
17 question.

18 But I believe that he said he was --

19 What was your objection, counsel, that he's not?

20 MS. ANTONIOLLI: He's not aware of the three phases
21 Mr. Borgman raised.

22 MR. KAINS: Okay.

23 BY MR. BORGMAN:

24 Q. Are you aware of wind turbine syndrome, any

1 symptoms that go along with that?

2 A. Well, there are people that have called something
3 wind turbine syndrome. It is not a recognized disease.
4 It has been looked at time and time again by researchers.
5 And, you know, certainly we knew about those claims when
6 Dr. McCunney, and I, and the others did the MIT study and,
7 clearly, didn't believe at the time that vibroacoustic
8 disease, or wind turbine syndrome, was something that
9 could be proven to be linked to wind turbines.

10 So I don't recognize, again -- limited as I am as
11 an engineer, I don't think that's recognized in the
12 medical community as something that is linked to wind
13 turbines and, certainly, vibroacoustic disease is probably
14 more so not linked to wind turbines.

15 I believe that was something that was discovered
16 with workers who were around very high levels of
17 infrasound. And, again, that is not the case here.

18 Q. We can agree to disagree, if I may. You've got
19 your reports, and there are a lot of other reports out
20 there that show different findings. Thank you for your
21 time.

22 A. Thank you.

23 MR. KAINS: Thank you, Mr. Borgman, for your
24 questions.

1 Mr. Sherman?

2 Was there somebody else who had a hand up?

3 Oh, okay, Mr. Phipps and Mr. Cronkhite and this
4 lady in the back that I don't know yet.

5 We'll go with Mr. Sherman.

6 EXAMINATION

7 BY MR. SHERMAN:

8 Q. Tom Sherman, Coles County.

9 Are there various sound studies done during many
10 differences in wind speeds?

11 A. What kind of study do you mean? Certainly, when
12 we do sound studies like sound monitoring, we'll monitor
13 at all sorts of different speeds.

14 Q. So, in your application, when you did the studies
15 at 196 sites, did you use various wind speeds to do that?

16 A. No. We used the maximum wind speed.

17 Q. What is the maximum wind speed?

18 A. So, for a wind turbine, at very low wind speeds
19 the turbines don't spin at all. It's then at a certain
20 wind speed, about, like, 3 meters per second, that's
21 called the cut-in speed, and then the wind turbines would
22 start to rotate at a very low RPM, like 4 RPM.

23 Then, as the wind increases, the rotational speed
24 will start to increase, and then at about I'll say around

1 10 meters per second that rotational speed stops getting
2 faster. So you're up around 10 to 12 meters, 10 to
3 12 RPM. And at 10 meters per second and 25 meters per
4 second wind speed at the hub height, the rotational speed
5 stays the same.

6 And then, at above about 25 meters per second,
7 then you get the wind turbines shutting down, cutoff
8 limit.

9 So the sound levels essentially follow the same
10 trend. Once you get up to about 10 meters per second, the
11 sound levels will stop increasing.

12 In fact, above 10 meters per second, they'll
13 actually decrease a little bit because there is less
14 turbulence, and the blades are more efficient capturing
15 the wind.

16 So what we do is we look at the wind speed at the
17 highest sound emissions, and then we use that highest
18 sound emissions in the modeling.

19 Q. We've heard about shadow flicker and sound. Have
20 there been any studies done about vibrations that are
21 caused by wind turbine rotation?

22 A. Yes, there have been.

23 Q. Can you name three?

24 A. I can't. I know they have been done, but I can't

1 name them here.

2 Q. But they do exist?

3 A. Yes.

4 Q. At the risk of knowing the answer, I am assuming
5 those are annoyances and inconveniences, too?

6 A. No. I believe those are just detectability.

7 Q. And are there negative impacts in relation to
8 vibrations, negative health impacts?

9 A. I don't know of any negative health impacts
10 related to wind turbines from vibration.

11 Q. So is it safe to say, as far as vibrations are
12 concerned, you don't have a knowledge based on that?

13 A. I could go back and look, but I can't testify to
14 that right now.

15 Q. Okay. Thank you.

16 In testimony from the shadow flicker witness and
17 the sound witness, we heard there is no health risk, at
18 least from those two witnesses; but then, other than the
19 requirement in the ordinance, why are we even talking
20 about this?

21 If it wasn't --

22 Let me ask it a different way. If the
23 requirement was not in the ordinance, would we even be
24 talking about this?

1 MS. ANTONIOLLI: I just ask that he clarifies the
2 question. It is unclear as what "this" is.

3 MR. SHERMAN: Shadow flicker.

4 MR. KAINS: I think I am going to overrule the
5 objection.

6 Can you state the question again, please,
7 Mr. Sherman?

8 MR. SHERMAN: We've heard that there is no health risk
9 from the two witnesses on sound and shadow flicker.

10 I know there is a requirement in the ordinance
11 about this. If the requirement in the ordinance about
12 shadow flicker, for one, or sound, for another, if that
13 was not in the ordinance, would this even be a topic for
14 discussion tonight?

15 MR. HESS: Respectfully, Mr. Kains, I would object. I
16 don't know how this witness could answer that question. I
17 mean, we've had certain questions from county board
18 members. We've had certain requests for Coles Wind, LLC,
19 to put on studies and evidence.

20 That is really a decision that is a question for
21 why Coles Wind did this, not why this particular witness
22 did this. So I would object. I don't think this is the
23 right witness for that question.

24 MR. KAINS: Okay. I am going to sustain the

1 objection.

2 And maybe, Mr. Sherman, if I could phrase
3 something: If there wasn't the requirement in the
4 ordinance with respect to, say, shadow flicker, if there
5 wasn't that requirement, is shadow flicker a concern?

6 Would this be fair?

7 MR. SHERMAN: Yes. Perfect. Thank you.

8 MR. KAINS: Is shadow flicker a concern?

9 THE WITNESS: I mean I think it is, and that's why
10 there are limits in the ordinance. The same with sound.
11 I would be concerned if there were no rules or limits to
12 noise. I think there should be limits to noise.

13 You know, as I testified earlier, there are, you
14 know, impacts to sound at the very high levels, and that
15 is why we have limits.

16 BY MR. SHERMAN:

17 Q. This next question, I don't mean to be flippant
18 about it, but if any one of us was to register a complaint
19 in regards to shadow flicker, or sound, when we register
20 that complaint, are we going to be subject to some kind of
21 psychological review on our annoyance and inconvenience
22 level?

23 MR. KAINS: If you know the answer.

24 THE WITNESS: I don't know the answer to that. I

1 highly presume not, but I don't know what a psychological
2 review would even look like.

3 BY MR. SHERMAN:

4 Q. The reason I ask that, again, you had said that
5 the annoyance is a question that you just ask, "Are you
6 annoyed?" Correct? In regards to sound?

7 A. In these surveys that we look at to try to
8 correlate sound levels to annoyance, yes; we ask whether
9 you are annoyed.

10 Q. So is it safe to say, if me, somebody in the
11 audience, we complain about the noise level, is somebody
12 going to ask us are we annoyed?

13 A. I don't know if they are going to ask. That
14 hasn't been established yet.

15 You know, typically what happens, when you have a
16 complaint, is that we try to understand what you were
17 annoyed about, what the situation was around the
18 annoyance. So is the wind blowing loud? Is there
19 something wrong with the turbines? Were you hearing a
20 clunking sound? So we'll try to establish what you were
21 hearing in order to try to diagnose what the problem was.

22 If the issue is just it's noisy all the time,
23 then it's something, you know, you might say, okay, we
24 need to find out more about it.

1 So there's a lot of factors that go into a
2 response to a complaint. But certainly we would want to
3 know why they were annoyed with the sound to see, you
4 know, what could be done to mitigate that, and was it the
5 level, or the characteristics of the sound, or the time of
6 day.

7 And then we may ask you to even log when you were
8 hearing the sound, again, so we could try to correlate
9 what you were hearing to something that was going on in
10 the wind part.

11 Q. So that gets into my next question related to
12 what you just said: If a person is going to submit a
13 complaint about the sound, is it a question/answer thing,
14 or do I take a videotape or a screen shot or, you know,
15 take my phone?

16 How do I register a complaint about the sound?

17 MR. KAINS: Mr. Hess?

18 MR. HESS: I would object. This is beyond the scope
19 of his direct testimony. We've had several company
20 witnesses talk about the complaint resolution procedure
21 that we are required to develop with Coles County.

22 He certainly did not talk about that in his
23 direct. He is not the right witness to talk about a
24 complaint resolution process that hasn't been developed

1 yet.

2 MR. KAINS: The objection is sustained.

3 My suggestion would be, Mr. Sherman, if there
4 were a complaint about either shadow flicker or sound that
5 it be addressed with the company -- I believe Mr. Conley,
6 who will be up next to answer questions from the public,
7 discussed last night the complaint resolution procedure,
8 so perhaps Mr. Conley might be able to answer that.

9 MR. SHERMAN: Okay.

10 MR. KAINS: And, again, these are good questions.
11 This gentleman is an engineer.

12 MR. SHERMAN: Sure.

13 MR. KAINS: And he has written a plethora of academic
14 articles, so he might not be up on just exactly what the
15 complaint resolution process is.

16 MR. SHERMAN: I totally understand.

17 MR. KAINS: I appreciate you, Mr. Kaliski, trying to
18 give a stab at things.

19 But go ahead with your next question.

20 MR. SHERMAN: Thank you. I much appreciate that.

21 BY MR. SHERMAN:

22 Q. I think it was last night that Ms. Taylor brought
23 up a very good point about the effects of wind turbines on
24 children.

1 Are there any studies in regards to sound or
2 shadow flicker and the effects of sound or shadow flicker
3 on children?

4 A. So I don't know of any on children.

5 The one study I do know on sound is the
6 Netherlands study that we talked about yesterday. So that
7 Baliatsas study -- B-a-l-i-a-t-s-a-s -- *Health Problems*
8 *with Wind Turbines*.

9 Q. Is that one of the five that you showed us?

10 A. That is one that I testified to yesterday.

11 MR. KAINS: It's called *Health Problems Near Wind*
12 *Turbines: A Nationwide Epidemiological Study Based on*
13 *Primarily Health Care Data*.

14 MR. SHERMAN: Okay. I am not finding that right off
15 the bat. Okay.

16 THE WITNESS: So that looked at -- that was
17 essentially a population study.

18 MR. HESS: Mr. Sherman, we have one for you.

19 MR. SHERMAN: Thank you.

20 THE WITNESS: And based on what I could see in the
21 report, they looked at -- the children were included in
22 the population, and they even looked at children as young
23 as at least five years old.

24 They did look, for example, at ADHD effects of

1 children between 5 and 19, and they did not find an
2 association between wind turbine noise and ADHD in
3 children.

4 BY MR. SHERMAN:

5 Q. That kind of gets into my next question. Is
6 there any impact with sound or shadow flicker, in regards
7 to a study that has been done on the children, on a
8 child's behavior?

9 A. I don't know.

10 Q. Both shadow flicker and sound are based on
11 models; is that correct?

12 A. We model sound and shadow flicker. I am not sure
13 what it's based on, but we do model sound and shadow
14 flicker both.

15 Q. Because the converse of that is: Are there any
16 studies done based on realtime, actually take a decibel
17 meter out there and listen for sound?

18 Are there any that is real, not based on the
19 modeling studies done?

20 A. My understanding is that the Health Canada Study
21 did monitor the actual sound levels.

22 Q. Is that the only one, to your knowledge?

23 A. I think that might be the only large-scale study,
24 but I'm not sure.

1 Q. And what were their findings out of that study?

2 A. I think there might have been a Japanese study
3 that also monitored sound.

4 Q. And what were the findings of the Health Canada
5 one in regards to actual realtime?

6 A. I don't have the quote here, but they didn't find
7 a correlation between the sound level and health effects.

8 Q. That they did find?

9 A. Did not.

10 Q. Which one is it? I am sorry.

11 A. They did not find a correlation.

12 Q. Did not?

13 A. Yeah.

14 Q. Okay. I am going to put a hypothetical situation
15 on you. I am going to get to a question, but let's use
16 the hypothetical situation that: The application goes
17 through. The building permit goes through. You start
18 construction. We build the wind turbines. They go up.
19 And then we have real issues with sound. Even Apex we
20 call and do the thing. Apex even acknowledges there is a
21 shadow flicker issue and there is a sound issue. What
22 happens? Do they shut it down?

23 A. I don't know that answer. That would have to be
24 worked out with the complaint resolution protocol.

1 Q. Okay.

2 MR. KAINS: It might be another question for
3 Mr. Conley, who is next.

4 BY MR. SHERMAN:

5 Q. Who pays for most of the studies that are done?

6 A. What study?

7 Q. Like, the MIT study you referred to last night.
8 Who paid for that?

9 A. So the MIT study, MIT paid me, and the Canadian
10 Wind Association funded the grant through the Department
11 of Biological Engineering of MIT.

12 And I'll just read from the paper: In accordance
13 with MIT guidelines, members of the CanWEA did not take
14 part in editorial decisions or reviews of the manuscript.
15 Drs. McCunney, Mundt, Colby, Dolbie, and Mr. Kaliski have
16 -- sorry -- have provided --

17 Q. That is okay. My next question is even maybe
18 further.

19 A. Sorry.

20 Q. In the five that you presented -- and now I've
21 got six -- is somewhere in there, at the back, or the
22 acknowledgment, or glossary, of who paid for the studies?

23 A. Yeah. So, in the ones that I prepared, including
24 the MIT study that we just talked about, the *Wind Turbine*

1 *Audibility and Noise Annoyance, a National Survey*, that
2 was Lawrence Berkeley National Laboratory, and that is
3 funded through the Department of Energy, US Department of
4 Energy.

5 *The Effects of Land-Based Wind Turbine Upsizing*
6 *At Community Sound Levels and Power Energy Density*, that
7 was also Lawrence Berkeley National Laboratories, funded
8 through the Department of Energy.

9 *In the Shadow of Wind Energy Predicting Community*
10 *Exposure of Annoyance to Wind Turbine Shadow Flicker in*
11 *the United States*, same, National Berkeley Laboratory,
12 funded through the Department of Energy.

13 I think those were the four that were my studies.

14 Q. Did Apex pay you for the study that is included
15 in the application?

16 A. Yes, they did.

17 Q. Are you familiar with a phrase "perception is
18 reality"?

19 A. I don't know what context you are talking about.

20 Q. In any context. Somebody's perception how they
21 perceive is their reality.

22 A. I don't know the phrase, but I could understand
23 what you are trying to get to. Yeah.

24 Q. Do you believe that to be true?

1 A. I guess, if you say what their perception is is
2 their reality, I don't know.

3 Q. If I perceive that I am annoyed with the sound of
4 a wind turbine, am I annoyed with the sound of a wind
5 turbine?

6 A. Yes.

7 Q. If I have that perception, and you agree that
8 that is true, does that, or could that, could that lead to
9 stress?

10 A. Yes.

11 Q. Could that stress lead to a medical condition?

12 A. If the stress is high enough, yes.

13 Q. So, if I am following the line of thinking, if I
14 feel I am annoyed, and I feel then that I am stressed, and
15 that stress can lead to a medical situation, the sound
16 from a wind turbine could cause me to have a medical
17 issue, correct?

18 A. No. No. There is that line. But in order to
19 get beyond the annoyance into a chronic stress effect, you
20 have this sort of -- it has to be a much larger impact.

21 I am not saying that individuals might not have
22 it. I am just saying the population studies that we
23 looked at, that link isn't there. You do have annoyance,
24 and at the levels of sound that this project is limited

1 to, you don't get that link between that next link between
2 annoyance and health effects.

3 Q. Okay. In earlier testimony, somebody talked
4 about the general welfare of the county in regards to
5 shadow flicker and sound.

6 If people are feeling annoyed and inconvenienced,
7 does not that also incorporate into the general welfare of
8 the residents of the county?

9 In other words, would you consider a person's
10 reaction to shadow flicker, and reaction to sound, as a
11 general welfare situation?

12 A. I don't know. I mean I can't answer that
13 question.

14 Q. Fair enough.

15 Okay. To your application, Appendix D5, page 8,
16 table 2, you referenced table 2 in the appendix on
17 page 8 -- excuse me -- a couple different times.

18 Is it safe to say that a GE turbine is louder
19 than a Vestas turbine?

20 A. I am sorry. I'm being a little bit of a
21 soundness geek here. Loudness has a very special
22 definition in sound, and so I am going to say yes; but I
23 am going to caveat that because you probably don't have
24 the same definition. That, at lower frequencies the

1 Vestas has higher sound emissions; and at mid frequencies,
2 the GE has higher sound emissions.

3 The critical frequency, at 1,000 hertz, the GE is
4 higher, and it is probably a louder turbine.

5 Q. Okay. Can you elaborate on the phrase you used
6 yesterday, "the trailing edge of the blade," I think?

7 Is it serrated?

8 A. Yes.

9 Q. And that's what you have, again, on page 8, right
10 underneath the table -- I am quoting here: Modeling
11 assumed the Vestas turbines are equipped with serrated
12 trailing edges at each of the 62 locations.

13 Is that correct?

14 A. Yes.

15 Q. And the GE ones are also equipped with that
16 serrated blade?

17 A. Yes. They have their own version of it.

18 Q. Okay. How often are those maintained to make
19 sure that they keep their, for lack of a better phrase,
20 serration?

21 A. Yeah. I don't know the answer to that question,
22 but maybe the next witness knows that. I don't know.

23 Q. And, again, I reference that because you compared
24 it to an owl's feather, correct?

1 **A. Yes.**

2 **Q. So an owl, obviously, loses feathers, regrows**
3 **feathers. So that serration for an owl keeps in**
4 **perpetuity for as long as an owl does, it keeps going.**

5 Would a wind turbine blade lose its serration?

6 **A. These are just -- they are different from owl**
7 **feathers. I was using it as an example. And they are**
8 **more like the serrations on a serrated knife, let's say.**
9 **So they are stiff.**

10 I can't answer the question on maintenance, but
11 **maybe somebody else from Apex can answer that.**

12 **Q. Is it safe to say, as much as you would need to**
13 **sharpen a knife, these would need to be sharpened?**

14 I'm just using your example you just said.

15 **A. No. It wouldn't need to be sharpened, but I was**
16 **just giving you the shape of it.**

17 **Q. I am with you. All right. Okay.**

18 **A. Yeah.**

19 **Q. In the next paragraph, where it keeps talking**
20 **about that, can you talk about GE turbines placed -- of**
21 **these 14 required in NR102 mode?**

22 What are we -- what are you talking about with
23 **the 102 mode, and the 101 mode, and 100 mode? What is**
24 **that?**

1 A. So these are modes of noise-reduced operations,
2 and the lower the number the lower the rotational speed of
3 the turbine and the lower the sound. So these are modes
4 that are provided to us from the manufacturer, and the
5 lower numbers are lower sound levels.

6 Q. Okay. And you said that 17, if I wrote this down
7 right last night, you said 17 of the 51 will need that?

8 A. 17 of the 62.

9 Q. Of the 62?

10 A. Yes.

11 Q. Again, I don't want to put words in your mouth,
12 but does that -- giving an example, is that like a
13 silencer on a gun?

14 A. You know, it's more like the speed controller on
15 a fan.

16 Q. Okay. Okay. Have there been any studies done on
17 the impact of shadow flicker on animals, other than human
18 beings?

19 A. I don't know of any.

20 Q. How about shadow flicker?

21 I am sorry.

22 How about sound?

23 How about sound on animals?

24 Any studies on that?

1 A. There have been.

2 Q. And what is the result?

3 Sorry. I thought you were going to continue.

4 What is the result of that study? Sorry.

5 A. I don't remember. I mean I'll talk in general
6 terms rather than a specific study.

7 I haven't seen any evidence, for example, that
8 the effects endangered species in any way.

9 In general, very high-noise levels affect how
10 far, like, a birdcall could be heard; so it might affect
11 birds, for example, that way.

12 But I don't have much more to say about that. I
13 haven't done ecological studies or read a lot of
14 ecological studies.

15 Q. Do you know the name of any study that you are
16 talking about?

17 A. No.

18 Q. No? Okay.

19 In the studies that -- I'll ask it differently.

20 How tall are the Vestas and GE turbines that Apex
21 is looking at? Do you know that?

22 A. The tip height of the Vestas, I believe, is
23 643 feet, and the GE is 610. I think I've got that order
24 right.

1 Q. Okay. Does the height of the wind turbine make a
2 difference?

3 A. I just want to confirm that, if you don't mind.

4 Q. Go right ahead. Sorry.

5 A. I want to look at my information.

6 Q. I am pretty sure the 624 is right. I don't know
7 about the 610.

8 A. Yeah. I just don't know which turbine is which.
9 So the Vestas has a 162-meter rotor at a hub
10 height of 105.

11 And the GE is 150-meter rotor at a hub height of
12 117.

13 So I think the GE is the taller one.

14 Sorry. Yeah. What was your question?

15 Q. Just the height of those two.

16 So the next question is: Does the height make a
17 difference?

18 A. In sound?

19 Q. Yes.

20 A. It makes a very small difference in terms of
21 sound propagation. So a higher turbine is further from
22 the ground. So, in some respects, it is further from
23 homes, but it's a very small difference in height.

24 And for the most part, that's the biggest effect

1 in terms of sound. It has --

2 Yeah, I am just trying to think of other
3 characteristic effects, but I don't know of any effects.

4 Q. And the reason I ask that, on the study that you
5 presented, *Wind turbine audibility and noise annoyance, in*
6 *the National US Survey individual perception includes some*
7 *factors*, you are listed as one of the top authors.

8 Almost at the very end, page 1139, the second
9 column --

10 A. I've got the wrong report. Just a second. Can
11 you give me the page number one more time?

12 Q. Third-from-the-last page.

13 A. Yes.

14 Q. The second column, the top bullet item: The
15 effects of physical wind turbine characteristics should be
16 further investigated; increases in wind turbine rotor
17 diameter correspond to an increase in wind speed absent a
18 decrease in rotor speed.

19 I'm getting to my point here.

20 The last sentence: Therefore, as wind turbines
21 get larger, higher levels of audibility and noise
22 annoyance may occur.

23 Is that correct?

24 A. That is what is written here. Yes. That is

1 something that we were speculating that it's a possibility
2 that could happen.

3 Q. So, to ask the question again, to make sure: The
4 taller the wind turbine, there may be more of this last
5 sentence occurring?

6 A. Yeah, but you have to also consider that the
7 increase in diameter, rotor diameter, corresponds to
8 increase in tip speed absent a decrease in rotor speed.

9 So what we tend to see is that, when the rotors
10 get larger, there is a decrease in the RPM, so that the
11 speed at which the tip travels in the disc around the
12 rotor, it doesn't increase as fast.

13 So that is why, for example, when you look at
14 these larger wind turbines -- and the next study we did,
15 was to actually look at that issue and to see if it does
16 create what we had speculated in our report; so this was
17 2019.

18 And then, in 2022, we did the turbine upsizing
19 report with Berkeley National Lab, and we actually could
20 get data from these wind turbine manufacturers on these
21 new larger turbines, and so we could model it out.

22 And, in fact, what we did find was that the
23 increase in the sound level wasn't as much as we had
24 thought it would be because of the corresponding decrease

1 in the rotor speed and the addition of the serrated
2 trailing edges, and the net impact was that the sound
3 levels from the larger turbines in the community is lower
4 than the previous generation and the current generation of
5 wind turbines at the time.

6 Q. Okay. Mr. Shook, one of the county board members
7 last night asked the question, and I would like to ask it
8 again in a little bit different manner:

9 You stated there was no correlation between wind
10 turbine sound and people getting sick; is that correct?

11 A. I don't think I would have answered that
12 question, people getting sick.

13 Q. Is there a correlation between wind turbine sound
14 and health issues?

15 A. So, from the research that I've reviewed, there
16 is no correlation between wind turbine sound and health
17 issues.

18 Q. So, all other things in a person's life being
19 constant, nothing has changed, and then the wind turbines
20 come into play, and they are turned on, and rotating, and
21 the noise, or the sound, starts, and they start to feel
22 ill, would there then be a correlation between the sound
23 and their medical wellbeing?

24 A. I don't know. That is something you would have

1 to ask a doctor about and how they would diagnose what the
2 person would have.

3 Q. That gets to my next question: Are there any
4 studies done by a medical doctor?

5 A. Yes.

6 Q. Can you give some? Three? Five?

7 A. Well, so the Wind Turbine and Health, a Critical
8 Review of the Scientific Literature, the MIT study we had
9 talked about, that was coauthored with me by three -- four
10 doctors, two of which are medical doctors.

11 I know there have been others. I know they have
12 been doctors. I just need to confirm whether they are
13 medical doctors, but that is an example.

14 Q. If you don't know, where could I go to find that
15 out?

16 And please don't just say Google it.

17 A. If you want to know whether the authors were
18 medical doctors?

19 Q. Yes. Thank you. Yes.

20 A. I don't know. You know, I don't know.

21 For example, Health Canada has a number of
22 doctors on their studies, and I don't know what their
23 doctors are in.

24 Q. That is part of my question. Because in looking

1 at the literature, it says doctor this, and doctor that,
2 but I don't know if that is, you know, PhD doctor, or a
3 medical doctor, or what, so that is the reason for my
4 question.

5 A. Right. Right. I know on the MIT study because
6 it says, you know, Dave Colby M.D., Robert Dolbie, M.D.,
7 and I know Dr. McCunney is an MD, so that is three doctors
8 on that study.

9 Q. Okay.

10 A. Medical doctors.

11 Q. Now, my last question, I don't mean to be
12 flippant, but I don't know what else to call this thing.
13 Last night we heard about the all-knowing ROCC, the ROCC
14 knows all, and it's open 24/7, 365, in Virginia, and it's
15 able to pull all the data and that kind of thing that Apex
16 is telling us.

17 Does the ROCC know what decibels each and every
18 wind turbine is producing at any minute of time?

19 MS. ANTONIOLLI: I am going to object. He's not an
20 Apex employee, so he wouldn't have that answer.

21 MR. KAINS: I am going to overrule the objection and
22 just ask the question.

23 Do you know anything about the ROCC that Apex has
24 in Charlottesville, Virginia?

1 THE WITNESS: I don't know anything about it. No.

2 MR. KAINS: Have you ever been there?

3 THE WITNESS: I have not. No.

4 MR. KAINS: You have no familiarity with it?

5 THE WITNESS: No. This was the first I've heard of
6 it.

7 MR. KAINS: You are an engineer. You are not an
8 employee of Apex?

9 THE WITNESS: Yes. That is correct.

10 MR. KAINS: Okay.

11 MR. SHERMAN: Is it fair to say that might be a
12 question for Mr. Conley, next?

13 MR. KAINS: Absolutely.

14 MR. SHERMAN: Perfect. I am done. Thank you.

15 MR. KAINS: Okay. Thank you, Mr. Sherman.

16 Mr. Phipps, you are up next.

17 MR. PHIPPS: Nathaniel Phipps, P-h-i-p-p-s,
18 northern Coles County.

19 EXAMINATION

20 BY MR. PHIPPS:

21 Q. If my battery will hold out, I can pull this back
22 up.

23 First, just a general question concerning
24 infrasound: You said that these wind turbines will create

1 infrasound, correct?

2 **A. Yes, they will.**

3 **Q. Okay. At what levels would those?**

4 Because my understanding of the study was that
5 that is not a monitored thing by the Illinois board.

6 **A. It's not something that we model the level of**
7 **infrasound. I could tell you that we did a study in**
8 **general of infrasound from wind turbines for the**
9 **Massachusetts Department of Environmental Protection and**
10 **Massachusetts Clean Energy Center, and we found that, on**
11 **average, at 20 hertz, which is the higher end of**
12 **infrasound, it was about 25 decibels below the perception**
13 **range.**

14 So I expect that these turbines are probably
15 pretty similar and would be well below the perception --
16 level of perceptibility.

17 **Q. Okay. Are you familiar with -- this is an**
18 **article that is from the National Library of Medicine,**
19 **Negative Effects of High-Level Infrasound on Human**
20 **Myocardial Contractility: Invitro Controlled Experiment.**

21 **A. Who is the author?**

22 **Q. There is a litany of them.**

23 **A. Who was the first author?**

24 **Q. Ryan Chaban.**

1 A. I don't know that one.

2 Q. Okay. It's a general study from Mainz, Germany,
3 talking about infrasound and its effect on cardiac
4 rhythms, basically, and how those impact.

5 Has there been any correlation with that study to
6 anything that you've been putting into your modeling?

7 A. I don't know the study at all.

8 Q. Okay. Okay. So infrasound can't be heard,
9 correct?

10 A. It can be perceived at very high levels. So, in
11 normal volumes, it cannot be perceived.

12 Q. Okay. What would be considered normal volumes?

13 So at 25 DB, for example, would you be able to
14 perceive that, or is that the --

15 A. At 25 DB, you would not be able to perceive it.
16 I can tell you what the level of the perception rate is
17 for at 20 hertz.

18 Give me a second.

19 This is a study we did, again, that was with -- I
20 am referencing the Massachusetts DB study, but the
21 thresholds are from an international standard.

22 So, at 20 hertz, it's around 80 decibels, the
23 level of perception.

24 Q. Okay. So there was no known perceptions below

1 80 decibels, correct?

2 A. Right.

3 Q. Okay. I think that is all I have. Thank you.

4 MR. KAINS: Very good. Thank you, Mr. Phipps.

5 All right. It's 7:30. We are going to take a
6 recess and come back with additional questions from
7 members of the public for Mr. Kaliski.

8 The Planning & Development Committee of the Coles
9 County Board is in recess until 7:45. Thank you.

10 (BREAK TAKEN.)

11 MR. KAINS: We are going to resume cross-examination
12 by the public, members of the public, with questions for
13 Mr. Kaliski. We had several hands up.

14 First, folks from Coles and Douglas Counties,
15 let's see hands of folks from Coles and Douglas who have
16 questions for this witness.

17 I see Mr. Shaw and Ms. Winslow.

18 All right. Mr. Shaw, you're up.

19 This is Clint Shaw.

20 MR. SHAW: Clint Shaw, S-h-a-w.

21 MR. KAINS: Go right ahead, Mr. Shaw.

22 EXAMINATION

23 BY MR. SHAW:

24 Q. In your research studies, the data that you are

1 coming up with, is that longitudinal data, like over all
2 of them, or over long periods of time, and sustained over
3 the life of the project as far as, like, before they are
4 there and after they are there?

5 A. Well, there are different types of studies. So
6 the -- I believe the Finland -- sorry. Let me just make
7 sure I have the right one.

8 The Netherlands study, which looked at the
9 population, they look at -- they have a database that goes
10 from 2012 to 2021, so they look at trends that go over
11 time.

12 The studies that we were involved with, with
13 Lawrence Berkeley National Labs, was essentially a
14 point-in-time study. So we sent out surveys, and we asked
15 people -- I am not sure if we asked people --

16 I am just going to refer to the survey document
17 so I can get it right.

18 Q. Okay.

19 A. Okay. So the question says: The next set of
20 questions asks about any effects the local wind project
21 has had on you. For these questions, think about the
22 experiences you've had over the past year.

23 And then it goes on to say: To what extent you
24 feel annoyed by each of the following effects of the local

1 wind project: Change to landscape, wind turbine lighting,
2 shadow flicker, and sound of the wind project.

3 So we are asking people to consider what they
4 have experienced over the year, and these are for projects
5 that have been built already.

6 We do ask questions about what they are thinking
7 before the project was built and after the project was
8 built, but it's not a longitudinal study per se where you
9 actually survey the population before and after several
10 surveys.

11 Q. Okay. So my understanding is that they have
12 lived with this for a period of time at that point and
13 have in some manner become accustomed to what is there
14 already?

15 A. I don't have any information on how long the
16 projects have been there. Sorry. I can't answer that
17 question.

18 Q. Okay. Within that study, is that across the
19 board of people who have signed an agreement?

20 A. No. So these were randomly selected people who
21 live around the wind farm. Some of them were
22 participating. Some of them were nonparticipating. Most
23 of them were nonparticipating.

24 I believe I have the breakdown of that, if you

1 want to know what the breakdown is between participating
2 and nonparticipating.

3 Q. That's okay. I want to make sure it's on both
4 sides of the spectrum, basically.

5 A. Yes.

6 Q. Okay. Earlier you talked about hearing at 200
7 kilometers. I am not a mathematician at hearing sounds at
8 200 kilometers, but that is what? 656,000 feet, give or
9 take a little?

10 A. If I said that, I made a mistake. You can't hear
11 wind turbines at 200 kilometers.

12 Q. Okay. What about a half a mile? What would one
13 of these turbines sound like?

14 Like, is there a way to quantify that in here?

15 Like, we could hear something of that nature to
16 give us a reference point, let's say, at half a mile or a
17 mile?

18 A. You know, all I could do is reference you to our
19 study, and you can take a look at the sound levels at
20 various distances from the turbines, but I don't like to
21 try to mimic the level of the sound. Well, certainly I
22 don't want to mimic it myself. But I don't want -- I
23 don't like reproducing sound indoors, which is with
24 speakers and where you would not get the same effect.

1 But I think you can -- you know, there are wind
2 turbine projects around and operating and, you know, I
3 encourage people to go try and visit them to see what it
4 really sounds like because that is really the only way you
5 can really get a sense of the characteristics of the sound
6 and what the living situation would be.

7 Q. I've been under them before in the daytime and
8 nighttime, but I didn't know.

9 The reason why I ask is because, at half a mile,
10 I am going to have one. At a full mile, I am going to
11 have four from my house.

12 So is there any sort of reference that you could
13 give me to speak to the fact that one is going to sound
14 like your refrigerator running or your dishwasher running?
15 Any sort of nature of that?

16 A. So if you look at the appendix, you can see sort
17 of a little graph of sound levels and various similar
18 pieces of equipment around your house that might be
19 operating.

20 And a lot of people compare the sound of a wind
21 turbine to a refrigerator. I don't like making that
22 comparison because they are so different in
23 characteristic, and that is why I think it's best just to
24 go out and to experience it yourself.

1 **Q.** I mean I understand very little about how sound
2 works.

3 **A.** Yeah.

4 **Q.** I do know that -- let's say, I'm, for instance,
5 out hunting. I want to call something in from a long
6 distance. I want the wind to my back so the sound is
7 projecting downwind.

8 If I am trying to call something within a short
9 distance, then I want the wind to my face, right?

10 How is that wind going to affect the amount of
11 sound travel coming through to where I'm at?

12 **A.** Yeah. That's a great question. So why is the
13 wind -- why does it sound -- why does sound propagate
14 better down there? I guess that is one question.

15 And it's not so much that the wind itself carries
16 the sound. It's that the wind year-round tends to be
17 lower than the wind aloft that tends to be higher.

18 So, it's almost more like the winds aloft are
19 going faster, pushing the sound towards the ground. So
20 instead of the sound just going straight, or up in the
21 air, the sound bends down towards the ground.

22 It's the same thing with temperature inversion,
23 where the warmer air is aloft, and the cooler air is down
24 below, the sound travels faster in the warmer air up

1 aloft, and so it's traveling faster, so it tends to bend
2 down towards the ground. So those tend to be the
3 worst-case conditions for sound propagation in terms of
4 the highest sounding sound levels because you are getting
5 the sound defracting or refracting towards the ground.

6 Q. Okay.

7 A. Whereas a sunny day, or upwind, the opposite
8 happens, where the sound bends up towards the sky. So, if
9 you are on the ground, you don't hear it as well.

10 If you are close, you know, those atmospheric
11 effects aren't able to take place. It's the same upwind
12 and downwind in your example.

13 Q. Right. Distance creates a barrier, let's say,
14 for the sound in some manner because of the way it's
15 refracting, or moving, or bending up, or bending down?

16 A. Right. Yeah. So, if you look at sound levels
17 over the long-term, they don't reach the maximum very
18 often. You know, of course, the wind turbines don't
19 achieve their maximum sound power at ten rounds per second
20 all the time, and they don't generate -- they don't
21 generate the maximum sound level all of the time. You are
22 not going to have inversion conditions all the time, and
23 you are not going to be downwind all the time.

24 So over the course of a year, the sound levels

1 are going to be lower than, on average, maybe about
2 5 decibels lower than what we report here.

3 But our focus is on the maximum in that inversion
4 condition, the downwind condition, and I think that's
5 appropriate.

6 Q. Okay. So my next question is: You said earlier
7 about having studies with animals and stuff, right?

8 A. (Nodding.)

9 Q. Are there any animals that the sound does affect?
10 The vibrations from the sound, are there any animals that
11 that does affect that you know of?

12 A. I don't know of any.

13 Q. Okay. Were there any of the people in your
14 studies, or any of the other studies that were brought
15 about, that actually had hearing disabilities, like they
16 were ultra-sensitive to certain sounds?

17 And the reason why I bring this up, I've got an
18 older brother who cannot hear, like, a female voice very
19 well. He can hear my voice from across the parking lot.

20 So I don't know if there's -- have there been any
21 studies where that has been researched?

22 A. I don't know of any studies that have looked at
23 various hearing -- I don't know -- I guess you would call
24 them hearing disabilities and how well people can perceive

1 sound. I am just trying to look through our studies and
2 see if we asked about normal hearing. I don't think we
3 did.

4 Q. Okay. Let's say --

5 A. We asked people if they were noise sensitive.

6 Q. Okay.

7 A. So maybe that could take into account somebody
8 like your brother. We didn't ask if they had normal
9 hearing.

10 Q. What about somebody with a hearing aid?

11 A. Yeah, again, I don't know it factored in.

12 Q. Does any of the verberation come through hearing
13 aids?

14 Because I mean I am sure there is somebody in
15 here that has a hearing aid.

16 But does that have any sort of, let's say,
17 disturbance in their hearing aid?

18 Because when you get a hearing aid, it's not like
19 you plug it in and, oh, I can hear again. You go to the
20 doctor like 50 times to figure out what frequency it is
21 that the hearing aid works for you.

22 A. I don't have any information on that.

23 Q. Okay. As far as the turbines being taller, so
24 then they -- let's say you are downwind, then they cast

1 the sound farther?

2 Let's say you take a 400-foot tall turbine and
3 you take a 600-foot tall turbine, is the 600 one going to
4 cast the sound farther than the 400, or no?

5 A. Only to the extent that the 400-foot turbine
6 might be blocked by terrain.

7 So, if you are, say, 1,000 meters away, and you
8 can't see the top of the turbine at 400 meters because of
9 the terrain, but at -- I am sorry -- 400 feet let's say --
10 not 400 meters.

11 But at 600 feet, you know, the blades might stick
12 up above the terrain, and then that could have an effect.

13 But we would include that in the model. We
14 include terrain in the model.

15 Q. I gotcha. So if the terrain is flat across that
16 area, and you have one that is 400 and 600, the sound
17 decibels that you are going to receive from it will be the
18 same?

19 A. Assuming they have the same sound power level,
20 the same sound emissions, they will be approximately the
21 same.

22 Q. Okay.

23 A. Within a few tenths of a decibel probably.

24 If the taller turbine is at the higher sound

1 emission, then the turbine would be louder.

2 Q. Okay. I think that is all.

3 MR. KAINS: All right. Very good. Thank you for your
4 questions, Mr. Shaw.

5 Anyone else from Coles or Douglas Counties with
6 questions?

7 Yes, Ms. Winslow.

8 Anybody else from Coles or Douglas Counties with
9 questions for this witness?

10 All right. And then we'll open it up for folks
11 outside of those two specific counties.

12 Go ahead with your questions. This is Connie
13 Winslow.

14 MS. WINSLOW: Connie Winslow.

15 EXAMINATION

16 BY MS. WINSLOW:

17 Q. I guess my first question is: Can wind turbines
18 generate static electricity and potentially increases the
19 likelihood of lightning strikes?

20 A. That is outside my expertise. I don't know that
21 answer.

22 Q. Okay. Who -- which expert might know that
23 answer?

24 MR. HESS: I mean, Mr. Kains, we are not going to have

1 a lightning expert, but I think that question could be
2 posed to Mr. Conley if it was worded as: Has Apex ever
3 had any experience of complaints with static electricity
4 or problems with lightning?

5 Mr. Conley is not an expert in lightning.

6 MR. KAINS: Right. And note: There are no lightning
7 experts who go around the country testifying.

8 But I think that, if it was a major problem, they
9 would have somebody here to discuss it, but I don't know.

10 But, Ms. Winslow, I think that's a good question
11 for Mr. Conley, who will be up next.

12 MS. WINSLOW: Okay. Thank you.

13 MR. KAINS: Thank you.

14 BY MS. WINSLOW:

15 Q. Are you aware of any studies with sound and
16 pacemakers?

17 A. I am not. No.

18 Q. Would it be fair to say there could be an
19 occurrence with sound causing an effect where a pacemaker
20 -- do you have thoughts about it?

21 A. I can't answer that question. I don't know how
22 pacemakers work, and I would be out of my expertise.

23 Q. Are there any problems with cell phones,
24 internet, radio, television, antennas on the TV or inside

1 the house, WiFi, satellites, or any communication or
2 electronic devices you might have in your residence?

3 A. Again, that's out of my expertise as well. I am
4 not an electrical engineer.

5 Q. What would you classify that would affect if it's
6 not sound? What would be affecting a TV or radio?

7 MR. KAINS: If you know.

8 THE WITNESS: It would -- I imagine it's the physical
9 structure of the turbine blocking the television or radio.
10 I am speculating, but that is what I would assume it would
11 be.

12 BY MS. WINSLOW:

13 Q. Electric wiring, or the turbines turning, or
14 what?

15 A. The physical structure of the turbine, but I
16 probably shouldn't speculate too much because I don't
17 know. It's not my field of expertise.

18 Q. What wind speed, miles an hour, do you know is
19 the low end for a turbine to start turning? And what is
20 the miles per hour when it will be shut off?

21 A. I'll give you a general range. I don't have the
22 specs of these particular turbines, but it's generally at
23 the hub height that they start turning around three meters
24 per second, which is 6.6 miles per hour. And they

1 generally stop turning around 25 meters per second, which
2 is 25 times 2.2, so that's 55. I don't know. It's
3 somewhere around 50 miles an hour. I can calculate it if
4 you want.

5 Q. Okay.

6 MR. KAINS: I don't think that's necessary. It's not
7 particularly relevant.

8 THE WITNESS: Okay.

9 MR. KAINS: But he said it's over 50 miles an hour is
10 when they shut off. So that's a fair guesstimate.

11 BY MS. WINSLOW:

12 Q. Have you any knowledge on whether wind turbines
13 affect weather radar beams, the lower beams, before
14 forecasting tornados or severe thunderstorms in an area?

15 MS. ANTONIOLLI: I am only going to stand up and let
16 Ms. Winslow know that we do have a report attached to the
17 application that covers communications, including radar,
18 so we can point you to that section of the application.

19 MR. KAINS: Is that an appendix, Ms. Antoniolli?

20 MS. ANTONIOLLI: Yes.

21 MR. KAINS: What appendix is that?

22 MR. HESS: D4, the telecommunication study.

23 To be clear, if the question Ms. Winslow is
24 asking about weather radar, Ms. Anderson testified on

1 that. That is not in that study. We actually get the No
2 Objection Letter from the NTIA, the National
3 Telecommunications Information Administration, and that's
4 the letter Ms. Anderson talked about, the revised letter
5 showing no interference with the linked-in radar.

6 I would also, just respectfully, object. I think
7 it's well beyond the scope of his testimony.

8 MR. KAINS: Yeah. Sustained.

9 So it's Appendix D4 on -- is that the weather
10 radar?

11 MR. HESS: Telecommunications.

12 MR. KAINS: Telecommunications.

13 And yes -- and it was a long time ago that
14 Ms. Anderson testified, but she did testify that they have
15 a letter from the NTIA, some federal agency that governs
16 this, that says they've got the all clear from them as far
17 as weather radar.

18 So he, again, is a noise engineer. He can
19 testify with respect to his expertise on noise issues and
20 on shadow flicker issues and as they relate to the public
21 health, if he knows. So go right ahead with another
22 question.

23 BY MS. WINSLOW:

24 Q. The noise level, is it measured from, like, the

1 gearbox around the blades, or measured at the tip of the
2 turbine's blades as it goes around, since it kind of
3 fluxes back and forth?

4 A. So the sound levels are -- to quantify the amount
5 of sound a turbine generates that we use in our model, the
6 manufacturers measure sound at a distance -- they measure
7 it on the ground at a distance of 1 tip height away. So
8 it would be, you know, about 643 feet away for the GE
9 turbine, as an example.

10 And that is to capture all of the sound coming
11 from the wind turbines. If you put a microphone right
12 next to the nacelle, or right by the blades, you only
13 capture one component of the sound. So that is why they
14 bring the microphone out much further at one tip height
15 distance.

16 Q. So they are measuring from the ground, or they
17 are up high when they measure?

18 A. They are actually measuring on the ground. And
19 the reason they measure on the ground, flush with the
20 ground, is to avoid any interference with wind.

21 Because as you go in elevation, the wind speed,
22 theoretically, at the ground is zero, or close to zero.
23 So they measure on the ground, on a ground board, which is
24 a hard surface so that -- they use a hard surface because

1 the porosity of the ground can affect the sound-level
2 measurements. If you use a hard surface, you know what
3 you are getting; you are always getting a reflective
4 surface on the ground.

5 There are several methodologies, and I could talk
6 about methodology all day. But that is basically what
7 they do to estimate or to measure the turbine sound such
8 that they can give us data that we can use in our models.

9 Q. Let me see if you know the answer to this: When
10 they measured the sound from your property line, is your
11 property line considered, like, the wall of your house, or
12 is it the grass, or is it, if you own acreage, the border
13 of your property line is the acreage?

14 A. So the IPCB standard just says that you would
15 measure within the property.

16 So we've -- and we've done measurements before,
17 and in Illinois.

18 And what we do is we'll take the residential
19 portion of the property, and then we'll go to the closest
20 point on the property line towards the turbines, so that
21 will be the worst-case location with respect to noise.

22 Q. So, I guess, to clarify for me, is that the
23 house, the yard, or the --

24 A. So it would be along the property line of the

1 yard closest to the turbine. That's where we would
2 measure.

3 Q. And then that's how you determine your setback of
4 the wind turbine?

5 A. That is not -- the setback -- the determination
6 of setback distance, that is also outside of my expertise.

7 Q. Do you know why they choose your grass of your
8 yard versus the edge of your property line, like
9 130 acres, instead of measuring at the acreage?

10 A. Yes. If the rest of that acreage is, for
11 example, farm, cultivated fields, that's a different land
12 classification under the IPCB standards. So we try to
13 measure on the residential portion of the property; so
14 that would be the edge of the lawn. Or if the edge of the
15 lawn is at the property line, it would be at the property
16 line.

17 Q. So does that mean, for future, if you were to
18 build something yourself, or sell a corner of your back
19 40, for someone to build something on, then they would be
20 closer to the turbine?

21 So, if there is any interference from the sound,
22 or flickering, because it's been premeasured, then that
23 would limit their enjoyment of living back there because
24 it's you are closer to the turbine?

1 A. My understanding of the IPCB rules and making a
2 -- this is from my reading of it, so I might get into more
3 legal opinion, but my understanding is that the rules
4 apply to the structures and the land uses that were in
5 effect at the time the project was built.

6 Q. So then that kind of limits you for your future
7 then because of that rule?

8 A. It may. It may not. You know, it depends. It
9 depends on what your land is, what the sound levels are,
10 whether somebody is bothered by the sound levels at
11 whatever portion of land you would like to subdivide.

12 Q. I think that is all my questions.

13 MR. KAINS: Very good. Thank you, Ms. Winslow.

14 Any other questions from members of the public
15 from Coles County or Douglas County?

16 During the recess, I had a question from Meg
17 Taylor.

18 Yes, ma'am?

19 MS. MARY MILLER: I have a question.

20 MR. KAINS: You are from Coles?

21 MS. MARY MILLER: Yes.

22 MR. KAINS: Okay. It's my understanding you are
23 Congresswoman Mary Miller?

24 MS. MARY MILLER: Yes.

1 MR. KAINS: Is that correct?

2 MS. MARY MILLER: Yes.

3 MR. KAINS: What town are you from?

4 MS. MARY MILLER: Well, we own land in northern Coles
5 County.

6 MR. KAINS: Okay.

7 MS. MARY MILLER: And we farm. Yes.

8 MR. KAINS: Okay. What town is it close to?

9 MS. MARY MILLER: Hindsboro and Oakland.

10 MR. KAINS: Hindsboro and Oakland. Are you in Coles
11 or Douglas?

12 MS. MARY MILLER: Both.

13 MR. KAINS: Okay. You own ground in both counties?

14 MS. MARY MILLER: Yes.

15 MR. KAINS: Then, Congresswoman, are you opposed to
16 the project, in support of the project, or neutral on the
17 project?

18 MS. MARY MILLER: I am highly opposed to
19 taxpayer-funded, Chinese, unreliable, unaffordable --

20 MR. KAINS: Are you opposed to this project?

21 MS. MARY MILLER: -- wind and solar energy.

22 Yes.

23 MR. KAINS: You're opposed to this project, okay.

24 I am just writing your name down here that you're

1 opposed.

2 Okay. Go ahead with your questions related to
3 his testimony on sound and shadow flicker, please.

4 MS. MARY MILLER: Sure.

5 EXAMINATION

6 BY MS. MARY MILLER:

7 Q. Does the proximity of a wind turbine 800 feet
8 from unleased land create an area where houses should not
9 be built?

10 A. I really can't say whether or not a house should
11 or should not be built in any area.

12 Q. Okay. Well, in light of your testimony, you're
13 trying to give everybody confidence about wind energy,
14 that there is not health impacts, that it's not
15 irritating, or whatever. I am just curious: Would you
16 build a home next to a wind turbine?

17 A. I don't know. What do you mean next to it?

18 Q. You don't know.

19 People, I would say that's a quick, easy, yes/no
20 answer.

21 A. I would like to clarify what you mean by next to
22 a wind turbine.

23 Q. Okay. 800 feet.

24 A. Probably not.

1 **Q.** Okay. Well, I do want to say that this is going
2 to drive people out of rural areas. Anybody that would
3 build a home in rural Illinois today would have to be
4 crazy because you could build a home and you can have a --

5 **MR. KAINS:** Could you please ask him a question,
6 Congresswoman?

7 **BY MR. SHERMAN:**

8 **Q.** -- windmill or solar farm across the street.

9 **MR. KAINS:** Could you please ask a question?

10 This is time for questions, not time for
11 testimony. You'll be given time for testimony. We are
12 probably going to be doing that next week.

13 So questions for him?

14 **MS. MARY MILLER:**

15 **Q.** Is it fair or constitutional to use a non-leased
16 piece of land as a noise-abatement zone?

17 Isn't this uncompensated taking of land for
18 private use?

19 **A.** I am not able to answer that question. I think
20 that's more of a legal question.

21 **Q.** Okay. And just to let you know: All this money
22 is in the pipeline, and this is a performative hearing,
23 100 percent. But when I have a chance, I will vote to
24 rescind the money. This is ruining rural Illinois.

1 MR. KAINS: Is this a question?

2 MS. MARY MILLER: This is ruining rural Illinois.

3 MR. KAINS: Any other questions from persons from
4 Coles and/or Douglas Counties?

5 All right. During the recess, Meg Taylor asked
6 me -- she asked questions of this witness last night, and
7 she asked if she could ask another question or two. And
8 it's in my discretion to allow that or deny that, and I am
9 going to allow just a couple of questions that Ms. Taylor
10 has thought of.

11 MS. TAYLOR: Thank you, sir. I --

12 MR. KAINS: Oh, it's Conley that you are wanting to
13 ask?

14 MS. TAYLOR: Yes.

15 MR. KAINS: Okay.

16 MS. TAYLOR: Is he going next?

17 MR. KAINS: Yeah, he will. Thank you, Ms. Taylor. I
18 got which witness you were wanting to question incorrect.

19 All right. Then folks from outside the county?

20 First, Mr. Cronkhite had his hand up, and then
21 Ms. Miller.

22 All right, Mr. Cronkhite.

23 Do you know Mr. Cronkhite?

24 COURT REPORTER: Yes.

MR. KAINS: Okay. Go right ahead with your questions for this witness, sir.

EXAMINATION

BY CRONKHITE:

Q. I am going to play -- I am playing right now a recording on a road that's 1500 feet from four turbines. So, if you start feeling something, if you start feeling illness, please let me know.

MR. HESS: Mr. Kains, I would respectfully object. He will have the opportunity to testify. He certainly hasn't laid a foundation for what he's about to play, and I don't understand -- this is time for questioning.

MR. KAINS: The objection is sustained. It's time to ask questions, Mr. Cronkhite. You can testify at the proper time, and I am hoping it will be next week. All right?

MR. CRONKHITE: All right.

MR. KAINS: Go ahead with questions related to sound and shadow flicker.

BY MR. CRONKHITE:

Q. There are three different types of audios. They're not -- there's infrasonic audio that you can hear, and then ultrasonic, correct?

A. You are referring to different frequency range of

1 sound.

2 Q. Right.

3 A. Yeah. Typically, we think of it as infrasonic
4 above 20 hertz, and ultrasonic above 20,000 hertz.

5 Q. Okay. All right. So what is the audio range
6 usually for most people?

7 A. Yeah. So the range of hearing for a healthy
8 adult would be between 20 hertz and 20,000 hertz.

9 Q. Okay. 20 hertz and 20,000, okay. When do the
10 turbines begin generating electricity?

11 You said that you monitor them, and you test
12 them, and so forth. When do they start generating
13 electricity?

14 A. Sir, do you mean like how often, how significant
15 structures --

16 Q. No. What is their speed?

17 A. Oh. Oh, yeah. So they start generating
18 electricity roughly at about wind speed of about 6 to
19 7 miles per hour.

20 Q. So wind turbines start generating electricity at
21 6 to 7 miles an hour?

22 A. Yes.

23 Q. Okay. How many of these kinds of presentations
24 have you done?

1 **A. I've done a lot of presentations. I haven't**
2 **counted.**

3 **Q. Okay. So you've done a lot. Okay. All right.**
4 You mentioned listening to sounds. How do you
5 listen to sounds, infrasonic, the infrasonic frequencies?

6 **A. Generally, you don't listen to infrasonic sound**
7 **because it's inaudible.**

8 **Q. It's inaudible; but it's there, right?**

9 **A. Yes. It's there. There's infrasound in this**
10 **room right now.**

11 **Q. Sure. Absolutely. So you listen to it. And so**
12 **these machines can generate those sounds, correct?**

13 **A. Yes, they can.**

14 **Q. All right. All right. You mentioned -- are you**
15 **aware of people who experience night effects when driving**
16 **through wind turbines?**

17 **A. Did you say night effects?**

18 **Q. Yeah, at night when they are driving through a**
19 **turbine area.**

20 **A. No. I am not familiar with that.**

21 **Q. You are not familiar with that. There is a lot**
22 **of people who do.**

23 All right. Well, that is really all I have.

24 **A. Okay. Thanks.**

1 MR. KAINS: Thank you, Mr. Cronkhite.

2 Ms. Miller?

3 MS. BECKY MILLER: Becky Miller, Vermilion County.

4 EXAMINATION

5 BY MS. BECKY MILLER:

6 Q. I've heard people ask you this evening about the
7 effects on animals, and I am interested because I've seen
8 dairy people say it's affected the dairy, the production
9 of their dairy cattle. They don't know if it's from
10 infrasound, stray voltage.

11 Do you know anything about that or any of the
12 studies that have or are allegedly going on with that?

13 A. I have not heard of any studies on that.

14 Q. Okay. And then earlier this evening, I believe
15 it was one of the two ladies, it would have been you made
16 a comment, and I wasn't going to ask a question, but after
17 you made the comment I had to ask:

18 You made the comment that shadow flicker only
19 happens, like, a couple of days a year, and I am totally
20 confused by that because I don't how you can shut shadow
21 flicker off.

22 A. So, if I made that impression, it's not a couple
23 of days, but it's very limited.

24 So the earth -- the sun every day comes up at a

1 different place in the sky, right? So, if you get shadow
2 flicker on one day, the shadow flicker is going to --
3 essentially, the sun is going to move, and eventually it's
4 going to move such that there won't be a shadow flicker at
5 that time.

6 Q. Could we clarify? The shadow flicker is still
7 occurring; it just might not come in your windows every
8 day; is that what you are trying to say?

9 A. No. No. It would actually move. The shadow
10 flicker moves.

11 Q. Right. But it's not stopping? I mean, like on
12 June 2, this tower is not going to produce any more shadow
13 flicker until --

14 A. Yes. That's exactly what occurs. Yes.

15 Q. I can't wrap my head around that because that's
16 like telling a tree it can't make a shadow.

17 A. I am going to try to use some more props to
18 explain.

19 MR. KAINS: Well, Mr. Kaliski, I don't think that is
20 necessary. You've testified that shadow flicker occurs
21 for a brief period of time on certain days and does not
22 occur at all on other days; is that correct?

23 THE WITNESS: That's correct. Yes.

24 MR. KAINS: Okay. I am still trying to wrap my head

1 around 40 plus 7 decibels equals 70.

2 Ms. Miller, I am mystified about stuff, too, but
3 scientists are a lot smarter than I am.

4 MS. BECKY MILLER: You say that. I am not saying that
5 about you.

6 MR. KAINS: I know. You are a nice lady from
7 Vermilion County. Go ahead with your question.

8 BY MS. BECKY MILLER:

9 Q. I met a man who lives in Royal. I have spoken
10 with him. He has turbines on more than one side of his
11 house. He told me that certain times of the year he has
12 constant shadow flicker. And then, when the seasons
13 change, it comes in the other side of his house.

14 So this one lady that has got four turbines
15 surrounding her house, is she ever going to be able to
16 escape the shadow flicker?

17 A. So, yeah, that is a good point. If you have
18 turbines that are at different locations around the house,
19 you might get shadow flicker more times of the year, and I
20 think we even show that graphically in our study.

21 If you can turn to -- yeah, page 8 of our shadow
22 flicker study. I don't know if you want to bring it up or
23 not.

24 MS. LODE: I think the projector is turned off.

1 Ms. Miller, would you like to look at that?

2 MS. BECKY MILLER: Sure. Thank you.

3 THE WITNESS: So, with a single turbine, the shape of
4 the shadow flicker is sort of like a bowtie; it goes out
5 to the east and west.

6 The shape of shadow flicker -- I mean, it's like
7 the frequency of shadow flicker would only occur to the
8 east/west. When you have multiple turbines, you might get
9 shadow flicker in different directions, generally; still
10 east/west, but you might get it from one turbine at one
11 time and another turbine at another time.

12 Generally, you don't experience shadow flicker,
13 even in a big project, more than -- there is a point at
14 which the shadow flicker, if you are further from the
15 source of the shadow, as you move away that that shadow
16 diminishes. So, at a certain point, the effects from the
17 surrounding turbines disappear.

18 But the history of that is you get more shadow
19 flicker if you have turbines on different sides of the
20 house.

21 MS. BECKY MILLER: Okay. Thank you.

22 MR. KAINS: Thank you, Ms. Miller.

23 Any other questions from folks outside of Coles
24 and Douglas Counties with respect to this gentleman's

1 testimony?

2 Mr. Hartke, do you have your hand up?

3 MR. HARTKE: Yes.

4 MR. KAINS: Very good. Come right up.

5 MR. HARTKE: Ted Hartke from Sidney, Illinois.

6 EXAMINATION

7 BY MR. HARTKE:

8 Q. Mr. Kaliski, have I said that right?

9 A. Yes.

10 Q. In the Illinois IPCB code for noise, there is a
11 section 900.102. It's the prohibition of noise pollution.

12 Are you familiar with that section, 900.102?

13 And if you are not, I'll say it, and you can say
14 yep that's it or not.

15 MR. KAINS: Go ahead and read it, Mr. Hartke.

16 BY MR HARTKE:

17 Q. Yes, I am there. Section 900.102. Here we go:
18 No person shall cause or allow the emission of sound
19 beyond the boundaries of his property as property is
20 defined in Section 25 of the Illinois Environmental
21 Protection Act so as to cause noise pollution in Illinois
22 or so as to violate any provision of this chapter.

23 Are you familiar with that section?

24 I said it correctly?

1 A. Yes. I have it in front of me. You quoted it
2 perfectly.

3 Q. That is the Illinois law, and it says: No
4 person, company, or entity can cause or allow the emission
5 of sound beyond the boundaries of his property.

6 Why are we going all the way to the yard of the
7 neighbor, to their grass, and to their home?

8 MS. ANTONIOLLI: First of all, that is not what
9 Section 900.102 says. That was a different version than
10 what I have.

11 MR. HARTKE: What does your version say?

12 MR. HESS: We also -- I mean two additional
13 objections. First of all, it calls for a legal
14 conclusion. He is not a lawyer.

15 MR. HARTKE: I asked why the noise --

16 MR. KAINS: Mr. Hartke, hold on. We have to get the
17 objection out.

18 MR. HESS: And, second, I have heard these questions
19 from Mr. Hartke before. These are the identical questions
20 that Ms. Winslow just asked. I would object this is now
21 repetitive questioning, which in Rule 5 of the rules, you
22 are authorized to exclude. So I would object; that is
23 exactly what Ms. Winslow just asked this witness.

24 MR. KAINS: Well, I am going to sustain the objection

1 on the grounds that he is not an attorney and can't
2 testify to this particular 900.102 of the Illinois
3 Administrative Code.

4 So, ask another question. Maybe, Mr. Hartke, you
5 could phrase it so that -- you know, ask if what they are
6 doing might violate the noise pollution provisions
7 contained in that title.

8 BY MR. HARTKE:

9 Q. Mr. Kaliski, when earlier you testified, and you
10 set up your machine, or measured the noise, you were
11 setting up at the property line, or the edge of the grass
12 of their yard, if Illinois law says the noise polluter,
13 the noise producer, isn't allowed to let that noise leave
14 their property line, how does that property line suddenly
15 move up next to the home?

16 A. That is not my understanding of what the Illinois
17 law says. It doesn't say that the sound can't move beyond
18 the property line. It says it may --

19 I'll read it again: The person may not cause or
20 allow the emission of sound beyond the boundaries of that
21 person's property line -- that's defined in Section 25 of
22 the Environmental Protection Act 415 ILCS 5/25 -- that
23 causes noise pollution in Illinois or violates any
24 provision of this chapter.

1 So the sound can leave the property. It just
2 can't cause noise pollution or violate any provision of
3 the chapter. Meaning, if you didn't allow noise to exit a
4 property, you would have no conflict at all, nor any -- I
5 mean nobody could mow their lawn or --

6 Q. No, I wouldn't -- I am talking about the
7 nuisance-level noise. See --

8 I'll ask the questions instead of testifying
9 here.

10 The Illinois Pollution Control Board has two
11 sections. One section is this numerical noise value,
12 which gives us certain decibels of each different range of
13 hertz, frequencies. And then the other portion is
14 generally nuisance noise. We are not allowed to disturb
15 the neighbor's portion.

16 That portion seems to cross the property lines
17 when you measure at the people's yard. Why would the yard
18 be the location where that was measured at?

19 MS. ANTONIOLLI: I am going to object. First, he's
20 mischaracterizing what the actual language of the
21 regulation says.

22 And, second, it calls for a legal conclusion.

23 MR. KAINS: I am going to overrule the objection.

24 What was the question again, Mr. Hartke?

1 BY MR. HARTKE:

2 Q. In the Illinois Pollution Control Board rules,
3 there's these two sections, one is the numerical value;
4 the other is just the nuisance noise portion.

5 If there is a nuisance noise issue, that noise
6 level belongs at the property line per the Illinois law.

7 Is there anywhere in the Illinois law that says
8 measure at the property at -- please measure at the grass
9 strip, house, residential use area?

10 Does it say that, in the instructions, to
11 measure?

12 A. Yeah.

13 MS. ANTONIOLLI: And same objection. There is a whole
14 body of case law that interprets where to measure, and
15 that isn't something that this witness is prepared to be
16 able to interpret.

17 MR. KAINS: I am going to overrule the objection.

18 Do you know why the Illinois law, as far as
19 measurement of sound levels, is placed where it is
20 anywhere on the property?

21 Do you know anything about that?

22 THE WITNESS: Section 910.105A determines site
23 selection for measurements.

24 MR. KAINS: What does it say?

1 THE WITNESS: And it says: One or more outdoor
2 microphone positions may be chosen within the boundaries
3 of the receiving land so long -- as long as positions are
4 at least 25 feet, 7.6 meters, from the property line noise
5 source.

6 So you have to be at least 25 feet from the
7 source of the sound and within the boundaries of the
8 receiving land. So that would be the land that is
9 receiving the sound.

10 MR. KAINS: So can it be anywhere on the land?

11 THE WITNESS: Anywhere on the land.

12 It goes further, and says -- other -- so one or
13 more outdoor measurement locations -- so you can put
14 several positions that may be chosen within the boundaries
15 of the receiving land.

16 And then other -- this is paragraph 2: Other
17 measurement locations may be used for investigatory
18 purposes, including the following: Determining the extent
19 of noise pollution caused by the source of sound,
20 determining the ambience, and analyzing those acoustical
21 parameters at the described sound source.

22 MR. KAINS: I think you've answered the question.

23 Go ahead, Mr. Hartke, with another question,
24 please.

1 BY MR. HARTKE:

2 Q. Okay. When a person owns their land, do you
3 think they own all of their land or just where the house
4 is at? When a person owns their land.

5 You may not be an expert in landownership, but I
6 think this is pretty easy.

7 Can you answer this question without your
8 attorneys?

9 MR. KAINS: I think it's common sense that people own
10 ground other than around -- other than their house, they
11 own their ground.

12 BY MR. HARTKE:

13 Q. Okay. Mr. Kaliski, do you agree that this is
14 common sense that we own all of our land?

15 A. If you own your land, then you own your land.

16 Q. Okay. Good. Does the neighbor have the ability
17 to encroach onto your land for a noise abatement zone if
18 the neighbor gets there first with the wind turbine?

19 Do you agree that that's okay?

20 A. I am sorry. If the neighbor --

21 MR. HESS: I would object. I am not sure what
22 Mr. Hartke is using the phrase "noise abatement zone" to
23 be.

24 MR. HARTKE: I can define.

1 MR. HESS: Excuse me, this witness certainly didn't
2 use that phrase.

3 I don't -- so I think it's a misleading question
4 to sort of assume that in the premise of a hypothetical.

5 MR. KAINS: I think that this is beyond the scope of
6 his direct testimony, and I am going to sustain the
7 objection. Ask another question, please.

8 MR. HARTKE: Sure.

9 BY MR. HARTKE

10 Q. If the wind turbine is built there first, is it
11 your opinion that it probably precludes a home being built
12 800 feet from the property line?

13 MR. KAINS: Based on sound?

14 MR. HARTKE: Based on the sound portion.

15 MR. HESS: I would object. I think this is verbatim
16 the question Ms. Winslow has already asked.

17 MR. HARTKE: Oh, this has been asked and answered?

18 MR. KAINS: It has been asked and answered, so ask
19 another question, please.

20 BY MR. HARTKE

21 Q. Okay. How far would you build a home from a
22 turbine?

23 What is the closest you think it would be from
24 these turbines in this project, due to the noise portion

1 of it?

2 A. Yeah. There's certainly rules with the county
3 about how close you can build a home to the turbine, and I
4 would certainly follow those rules, and I would make sure
5 that the sound level at the home would meet the IPCB
6 limits at day and nighttime.

7 Q. So the distance from a house is important, and
8 the distance from a property line to a turbine is
9 important.

10 MR. KAINS: There is not a question pending.

11 THE WITNESS: Okay.

12 BY MR. HARTKE:

13 Q. Is it important that there is a difference
14 between the turbine location from the property line per
15 the county rule and the distance from the house per the
16 county rule?

17 There are two different distances.

18 Is that very important?

19 MR. HESS: I believe those distances he is referring
20 to are setback requirements.

21 MR. HARTKE: Yes.

22 MR. HESS: It's beyond the scope of this witness's
23 testimony. I would object.

24 MR. KAINS: Sustained. The setbacks have to do with

1 the tip height. There is some formula; it's like 2.1
2 times the tip height, and that's the law.

3 And it has nothing to do with this man's
4 testimony.

5 But it's my understanding, and I believe that --
6 I am trying to recall which witness, whether it was
7 Mr. Moore or Ms. Anderson that previously testified, that
8 they have complied with the property line setbacks; so no
9 turbine would be placed within that setback. So they are
10 at the proper distance, is my recollection of either
11 Mr. Moore or Ms. Anderson's testimony.

12 So go ahead, Mr. Hartke, ask another question.

13 BY MR. HARTKE

14 Q. Okay. I am trying to get my question answered
15 here, but you want to dance around it. So I am going to
16 try to narrow it down a little more, okay?

17 A turbine base gets approved 1.1 feet from a
18 property line and I proceed to build a home 50 feet from
19 my property line. Is that going to cause a noise problem
20 inside my home at night?

21 A. So, by that calculation, you're 51 feet from the
22 turbine base.

23 Q. No. The turbine is at 1.1 times the distance
24 from my property line.

1 A. Oh.

2 Q. Therefore, it's 780 feet, let's say, or 800 feet.
3 Then I build my home 50 feet from the property line. So
4 let's say we are 800 feet from the house, and I build my
5 home on my land that I own that is not leased. Will I
6 have a noise issue inside my home 800 feet from the
7 turbine if it's built at that property line setback?

8 MS. ANTONIOLLI: Again, this is a question about
9 setbacks, so I object.

10 MR. HARTKE: No. It is a noise question. Am I going
11 to have a noise problem inside my home, if I am legally
12 building my home on my own property?

13 MR. KAINS: I am going to overrule the objection,
14 allow Mr. Kaliski to answer, if he knows.

15 Can you build a house 800 feet from a turbine, if
16 you want to?

17 MR. HARTKE: No. That is not the question.

18 MR. KAINS: Okay. What's the --

19 MR. HARTKE: The question is: Am I going to have the
20 noise issue that is going to pester me inside the home?

21 MR. KAINS: If you are 800 feet away?

22 MR. HESS: And I just want to state, for the record,
23 that I'm objecting to the extent that Mr. Hartke is
24 mischaracterizing this county's setback requirements,

1 because there is 2.1 and 1.1. And I wish Ms. Anderson was
2 here.

3 MR. KAINS: We are going to get to that discussion in
4 a second.

5 MR. HESS: Yes, sir.

6 MR. KAINS: Would there be a noise issue, is the
7 question, if a home was 800 feet away from a turbine?

8 THE WITNESS: So I think the question was: Am I going
9 to be annoyed, or am I going to have an issue with it?
10 And that, I can answer. Some people would, some people
11 wouldn't, and I don't know if you would.

12 The question is: Is it likely to exceed the
13 Illinois Pollution Control Board's nighttime standard at
14 800 feet from a turbine? Then, it may. I haven't done
15 the modeling for that, but to me it seems close.

16 MR. KAINS: Okay. Now, I am going to ask this of
17 counsel, and if you need to consult with Mr. Moore, you
18 can.

19 The closest turbine in this project to a
20 residence?

21 MR. HESS: If I may have just a moment?

22 MR. KAINS: Is it more than 800 feet?

23 MR. HESS: Absolutely. And if I can have a moment, I
24 think we can pull up Ms. Anderson's slides where she

1 explicitly addressed it.

2 MR. KAINS: You can try to pull it up, and if you get
3 to it, you know --

4 But in this project, is there a residence within
5 800 feet of a turbine?

6 What is the setback?

7 How many -- how many feet is the --

8 MR. HESS: I don't believe there is.

9 MR. KAINS: -- setback?

10 MR. MOORE: From a house, it's 2.1 times the tip
11 blade.

12 MR. KAINS: 2.1 times the tip blade, which is 624?

13 MR. MOORE: 643.

14 MR. KAINS: 643?

15 Mr. Kaliski, you are smarter than I am. Can you
16 do the math on that?

17 MR. DOUGHTY: A quarter mile.

18 MR. KAINS: What?

19 MR. DOUGHTY: A quarter mile is what I wrote down.

20 MR. KAINS: Mr. Doughty has a quarter mile.

21 MR. DOUGHTY: Well, I don't understand 70 plus 40
22 either.

23 MR. KAINS: Thank you, Mr. Doughty.

24 Mr. Kaliski, 643 times 2.1 is?

1 THE WITNESS: 1,350.

2 MR. KAINS: 1,300 and --

3 THE WITNESS: And 50 feet.

4 MR. KAINS: -- and 50 feet. So there will be -- will
5 there be any --

6 Counsel, will there be any home in this project
7 closer than 1,350 feet to a turbine?

8 MR. HESS: There will be no nonparticipating
9 residences.

10 MR. KAINS: Okay.

11 MR. HESS: And that is what I was trying to say. My
12 colleague helped me. Coles County's ordinance states
13 there's two different setbacks, participating versus
14 nonparticipating. So, to the extent we are talking about
15 nonparticipating residences, which I think is the premise
16 of Mr. Hartke's question --

17 MR. KAINS: That is what we are here about.

18 MR. HESS: Then absolutely not.

19 MR. KAINS: Oh, okay. All right.

20 Now, Mr. Hartke, your 15 minutes is up. But now
21 we've spent a lot of time with objections going back and
22 forth, so I am going to -- sir, I want to give you extra
23 time. So I am going to give you an extra five minutes --

24 MR. HARTKE: Thank you.

1 MR. KAINS: -- pending objections.

2 So go right ahead with another question for the
3 witness.

4 BY MR. HARTKE

5 Q. Okay. These boys are going to object.

6 Okay. Mr. Kaliski, if I own all my land, and I
7 build a home on my land, and I had a noise issue --
8 because I am building a home on my land -- just because
9 the turbine was that close to me, and I didn't know
10 better, and I built my home, and I had a noise issue, and
11 I couldn't sleep at night, what would you -- what do you
12 do about that?

13 Do you -- would you turn the turbine off at
14 night?

15 Would you move it?

16 Tear it down?

17 What do I do when I build my home on my land and
18 the noise is exceeding the Illinois Pollution Control
19 Board American Noise Level?

20 What happens?

21 MR. KAINS: Mr. Hartke, does your question assume that
22 the turbines were there before you built your home?

23 MR. HARTKE: Same time. Say we are a tie, or the
24 turbine is there.

1 MR. KAINS: Okay.

2 MR. HARTKE: The point of this --

3 MR. KAINS: If the turbine was there, I think there is
4 an Illinois Supreme Court case with respect to O'Hare
5 International Airport and something called moving toward
6 the nuisance.

7 And so the short answer -- and he's not a lawyer,
8 but I am, so I can give you the short answer, if a lawyer
9 can give a short answer.

10 The short answer is: You don't have any claim if
11 you build a house knowing that there is some potential
12 noise problem there.

13 So it would be, if you had a house already
14 existing, and then they put a turbine closer than the
15 setback, then you would have grounds for, you know, a
16 complaint.

17 MR. KEYT: Mr. Kains, can I add here?

18 MR. KAINS: Mr. Keyt, yes.

19 MR. KEYT: So the question of when the house, or when
20 the nonparticipating residence came into existence is
21 important because the state statute, which is mandated for
22 the county to pass, determines when the setback or when
23 the occupied -- occupied nonparticipating residence comes
24 into existence, and it is set when the application is

1 filed.

2 So, if the nonparticipating residence existed at
3 the time of the application, that's the time period that
4 is important because that is what the state statute says,
5 which is, under state statute, what Coles County then is
6 mandated to pass.

7 The question then is: Is there a
8 nonparticipating residence that is in violation or would
9 be in -- would the wind farm be in violation of that
10 setback requirement based on an existing non-occupied
11 residence, not whether or not someone comes and builds one
12 in the future.

13 The state statute does not address that issue,
14 and it's not for Coles County then to regulate that issue
15 because the state says you can't.

16 MR. KAINS: Okay. So any further discussion about
17 setbacks would not be relevant to the issue because they
18 have already stated that everything in their application
19 conforms with the setback requirement that the state has
20 passed back in 2023.

21 So let's go with a couple more minutes, Mr.
22 Hartke, of questions on sound or shadow flicker for this
23 gentleman but not setbacks.

24 BY MR. HARTKE:

1 Q. Mr. Kaliski, do you think that the noise level of
2 the turbine had anything to do with the setbacks
3 established by legislature?

4 MR. KEYT: I'll just object to relevance. The state
5 legislators made the mandate to the county. They county
6 has to pass an ordinance that complies with the state
7 mandate. Why the legislation passed it that way, I don't
8 know. The question is irrelevant.

9 MR. KAINS: We could argue about the legislation until
10 the cows come home.

11 And I am going to sustain Mr. Keyt's objection.

12 It's just not relevant. The setbacks are the
13 setbacks. They are the setbacks.

14 So go ahead, Mr. Hartke, a couple more questions.

15 MR. HARTKE: All right. I'll let off the pressure of
16 the constitutionality and all of that stuff.

17 MR. KAINS: Yep.

18 BY MR. HARTKE:

19 Q. I'll let off the pressure on that.

20 Okay. I said the words "noise abatement zone,"
21 which produced an objection.

22 If I asked you, Mr. Kaliski, can you describe a
23 noise abatement zone area around a turbine where it's
24 impacting people's home, living, occupying, whatever,

1 gardening, what do you think the noise abatement zone is
2 that would meet the IPCB numerical standards?

3 What do you think the distance is for these
4 turbines today?

5 MR. KEYT: Same objection. It's irrelevant. The
6 state has set what the setback requirement is. They have
7 mandated that to the county. The county then has to pass
8 the ordinance in accordance with the setback requirements.

9 MR. HARTKE: I didn't ask the setbacks. I said the
10 noise abatement area, what that distance is.

11 MR. KEYT: Same thing. Irrelevant.

12 MR. KAINS: It is.

13 Mr. Hartke, I am going to sustain the objection.

14 You get one more question. I have been very
15 patient with you.

16 MR. HARTKE: Can we pull up the aerial photos where it
17 shows the maximum noise level arc? It's kind of like
18 crossing one of the farm fields.

19 MS. Lode: Which receptor?

20 MR. HARTKE: It can be any of them. You had, I think,
21 six of them in there. I didn't count. Thank you for
22 looking that up.

23 That would be a good one, right there.

24 MS. LOEB: For the record, I am showing page 397 of

1 698 of the record, which is page 67 of our sound modeling
2 report.

3 Is that not working? Give me one second.

4 BY MR. HARTKE:

5 Q. Okay. There is a red shaded area on this drawing
6 going at a diagonal across this farm field, and the
7 nearest corner of this barn, probably on the corner of
8 that lot, from that red line on this drawing, how far from
9 that red line to the turbine is it generally, on average,
10 from that red line up to the turbine?

11 A. I don't have that distance.

12 Q. Okay. There is another chart that you can look
13 at that. It's going to be one of the noise contour maps.
14 It's probably like the 500 hertz noise contour line map.
15 I think -- is the 500 hertz the one that is closest,
16 usually?

17 A. 1,000.

18 Q. It's 1,000? Okay.

19 MR. KAINS: This is the last question.

20 MR. HARTKE: No problem.

21 MR. KAINS: Thank you.

22 BY MR. HARTKE:

23 Q. You got it.

24 A. So page 61? All right. If you wanted me to

1 measure it, I can. It would be an estimate using the
2 scale that is on the printout. Is that what you want me
3 to do?

4 Q. That would be fine.

5 MR. HARTKE: All right. Are we on the 1,000 hertz at
6 the bottom?

7 MS. LODGE: Yes.

8 MR. HARTKE: Thank you.

9 BY MR. HARTKE:

10 Q. I think I am looking for the yellow circle on
11 these drawings. That yellow line is the line I think I am
12 looking for.

13 A. It's the pink dashed line.

14 Q. Okay. Just inside the yellow line?

15 A. Yeah.

16 Q. Okay.

17 A. Okay. I am going to do this very scientifically
18 with a little piece of paper, so give me a second. I am
19 just going to pick one turbine at random.

20 Q. Yes, sir.

21 A. And it would be about 500 meters.

22 MR. KAINS: Okay. All right. Thank you, Mr. Hartke.
23 Your time is up. I am sorry.

24 MR. HARTKE: That is about 1,640 feet.

1 On the record, that is the noise abatement area.

2 MR. KAINS: All right.

3 MR. HARTKE: We can't live that close to the turbine.

4 | Thank you.

5 MR. KAINS: Thank you, Mr. Hartke.

6 Any other questions for Mr. Kaliski from members
7 of the public?

8 Okay. Questions from Coles County staff and
9 consultants?

10 | Mr. Lockhart?

11 MR. LOCKHART: No.

12 MR. KAINS: Counsel for the County Board, Mr. Keyt?

13 MR. KEYT: I do have some questions.

14 MR. KAINS: If we go past 9:00, I understand. I hope
15 the board will be patient with its attorney and
16 understand.

17 MR. WATTS: Certainly.

18 EXAMINATION

19 | BY MR. KEYT:

20 Q. Okay. Mr. Kaliski, as I understand it, the
21 appendix D3 or D5 to the application is the sound study
22 that was prepared by your company. Fair?

23	A. Yes.
----	---------

24 Q. In looking at the engineer's stamp on it, it's

1 stamped by Isaac Old. Is that one of RSG's engineers?

2 A. It's a board-certification stamp. It's the
3 board-certification stamp. And, yes, that is stamped by
4 Isaac Old, and he's one of -- he's employed by RSG.

5 Q. Is he the one that drafted the report?

6 A. Yes.

7 Q. Is he the one that did the sound modeling for the
8 report?

9 A. He was managing sound modeling. He may have done
10 it himself or he may have had another employee do it but
11 under his supervision.

12 Q. Were you involved in drafting the report?

13 A. I was involved in reviewing the draft final
14 report, and I am actually mentioned in here.

15 Q. Do you have to sign off on it before it's
16 approved, or does Mr. Old do that?

17 A. So what we do is -- somebody needs to review it
18 before it goes out. So Mr. Old writes the report.
19 Somebody else needs to review it. And I am the principal
20 in the group, so I usually do most of the reviews.

21 Q. Understood. Were there any prior drafts of this
22 report?

23 A. I don't know.

24 Q. And the way sound modeling or sound rules work in

1 Illinois is, essentially, it separates land into
2 classifications, Class A, Class B, and Class C land; is
3 that fair?

4 **A. Yes.**

5 **Q.** Class C land would be things like agricultural
6 land or industrial-type facilities?

7 **A. And energy facilities, yes.**

8 **Q.** Class B land would be something more like
9 commercial-type properties?

10 **A. Yes.**

11 **Q.** And then, Class A land for use would be something
12 like a residential?

13 **A. Yes.**

14 **Q.** Where, in your opinion, does something like a
15 church fall into that category?

16 **A. A church would be Class A.**

17 **Q.** In terms of -- in terms of how you modeled it, or
18 how RSG modeled it, they put receptor sites, if I am
19 understanding it, at all of the residential use properties
20 that are within the area of the wind farm?

21 **A. That's right.**

22 **Q.** And then they run the modeling to see where it
23 falls out in terms of whether there is any residential use
24 property that is over or any other properties that might

1 be over that IPCB limit?

2 **A. That is correct.**

3 **Q.** In running that modeling, were there turbine -- I
4 am sorry. Excuse me.

5 Were there receptor sites that were over that,
6 that then resulted in turbines having to be moved from one
7 location to another, if you know?

8 **A.** I don't know if they have to be moved. I don't
9 know that. I do know that we did have to run the model
10 over at least once because the GE turbines, without
11 mitigation, would have been over the IPCB standards. So
12 we did iterations to implement NRO from the operations to
13 reduce the sound levels for the GE turbines.

14 **Q.** So I want to direct your attention then to
15 page 24 of the report, which is Appendix C, and it has
16 source information that is -- I think Appendix C, Source
17 Information, is the title, and at the top of the page
18 there are sound propagation modeling parameters that are
19 listed there, and I just want to ask you about those for a
20 moment.

21 So the first one deals with ground absorption,
22 and it says: Mixed ground, .5, or GE .5.

23 Do you see that?

24 **A. Yes.**

1 Q. If I understand it correctly, when you say mixed
2 ground, it is a mix of hard surface and soft surface?

3 A. So .5 would be 50 percent hard and 50 percent
4 porous.

5 Q. Meaning that zero would be something like
6 concrete or asphalt, something like that?

7 A. Yes. And one would be a farm field, typically.
8 Yeah. That would be a porous.

9 Q. Where would -- sometimes it gets cold here, I
10 think you can agree, in Coles County.

11 Where would it land on frozen ground?

12 A. If the ground was completely frozen, it would be
13 a higher level. If it would be 71, it might be .5; it
14 might be a little higher than that.

15 Q. It would be closer to zero?

16 A. Maybe not. But I am going to modeling parameters
17 used here together. If you look at them together, with
18 the 4-meter receptor height, the 2 decibels -- additional
19 2 decibels that we add for uncertainty, that gives us
20 almost the same exact result as if we used GE equals zero.

21 So this is -- the parameters we use in
22 combination are equivalent to completely hard ground.

23 Q. That's where -- I am trying to understand what
24 the assumptions are. So that is what --

1 The next question is: When you come to the
2 temperature part, or atmospheric continuation, it lists --
3 I assume that is 10 degrees Celsius and 70 percent
4 relative humidity.

5 **A. Yes.**

6 **Q.** Now, sometimes in Coles County, it can be very
7 hot, too. It might be 100 degrees, and the humidity might
8 be quite a bit higher; is that fair?

9 **A. Yes.**

10 **Q.** In those conditions, if it's hotter, sound will
11 travel farther?

12 **A. Not necessarily. No.**

13 **Q.** What about when it's more humid?

14 **A. Not necessarily.**

15 **Q.** What about if the ground is frozen? Will the
16 sound travel farther?

17 **A. Yes.**

18 **Q.** Okay. If I look at the contour map -- and I'll
19 just point -- I'll point one out.

20 If you look at page 72, and it's receptor site
21 00031, and I just want to understand what the map
22 represents here in relation to the sound study.

23 So the map, if I am understanding it, the line is
24 the 41 decibels, which is the limit for 1,000 hertz; is

1 that fair? Am I understanding that correctly?

2 **A. Yes.**

3 **Q.**So everything that is -- and I believe that map
4 is oriented with north being up, but everything to the
5 north of that purple dotted line would be over the 41
6 hertz; is that correct?

7 **A. Over 41 decibels.**

8 **Q.**Over 41 decibels. I am sorry.

9 **A. Right.**

10 **Q.**Okay.

11 **A. Yes.**

12 **Q.**If I understand it correctly from prior
13 testimony, the area that is for the building or structure,
14 that is to the north, that would be a church?

15 **A. Correct.**

16 **Q.**So my question is, if that is within that shaded
17 area, that is modeled to be over the 41 hertz?

18 **A. Right.**

19 **Q.**Okay. Now, if I am understanding that --

20 Well, here is my question, is that: You
21 indicated earlier that a church would be Class A use?

22 **A. Yes.**

23 **Q.**And would be subject to the IPCB limit for Class
24 C going to a Class A land?

1 A. Yes.

2 Q. So my question is: Is that church over the
3 limit?

4 A. Yes.

5 Q. Okay.

6 A. And as I mentioned in testimony before, when the
7 final turbine array is finalized, we'll redo the sound
8 modeling, and this land use will be modeled to meet the
9 Class A limits.

10 It meets the daytime Class A limits, but it
11 doesn't meet the nighttime limits. But when we redo the
12 modeling, we are going to make sure that the church does,
13 and the parking lot as well, meets the Class A limits.

14 Q. How will that happen? How will you make sure
15 that meets the Class A limits?

16 A. So we'll put a receptor there, and then we'll
17 also look at the noise contour line when the model is run
18 to make sure that both the sound level at the church and
19 the sound level at the church property doesn't -- meets
20 the limit.

21 Q. So I guess my question is: Why would it change
22 between now and when you get closer to the building permit
23 stage?

24 A. So it will change for potentially two reasons:

1 Number 1, we are going down -- Apex is going down from 62
2 to 51 turbines. So a turbine that has a problem here is
3 T13, and so T13 could be one of the turbines that is
4 eliminated.

5 Number 2, they could decide to use the GE rather
6 than the -- sorry -- Vestas rather than the GE turbines.
7 And if the Vestas turbines are used, then the sound level,
8 even under this configuration, would meet the IPCB limits
9 at the church.

10 Or Number 3, nothing changes. They go with the
11 GE turbines, and in that case we would have to redo the
12 modeling and incorporate noise-reduced operations in T13,
13 which it currently doesn't have noise-reduced operation.

14 So this can be mitigated to noise-reduced
15 operations, if needed.

16 Q. So that leads me to the next question. So if
17 there are ways to mitigate the sound overage, like on this
18 example, my understanding is Apex would be willing to
19 implement those sound mitigation techniques or
20 technologies to make sure that these lands then are going
21 to be compliant; is that fair?

22 A. They have indicated to me that they will treat
23 the church that is a Class A land and implement mitigation
24 in order to meet the IPCB limits.

1 **Q.** Let me turn your attention then to another page;
2 it's page 75, and I believe it is receptor 00081. I broke
3 my glasses right before the hearing, so forgive me.

4 So here is my question here: Under the
5 assumptions that -- under the assumptions of the modeling,
6 for example, you have a mixed-ground terrain, under the
7 modeling assumption. If the ground was frozen, would that
8 line representing the 41 megahertz, would that move
9 farther north?

10 **A.** No. No. As I mentioned before, the parameters
11 that we are using, if we use frozen ground, it's
12 essentially equivalent. So I think it's in the ACP 111-1
13 standard; but, basically, you have options. You could
14 either use G equals zero, hard ground, or you can use
15 these other parameters of G on mixed ground at 2 decibels
16 and use a 4-meter set drive. So all of those latter
17 assumptions essentially raise the sound level to what it
18 would be if you had a hard ground out there.

19 **Q.** So that was my -- and I appreciate that
20 explanation because that is where I was going is, if,
21 based on what the adjustments to the assumptions are, you
22 essentially end up modeling what would be equivalent to
23 frozen ground anyway. Is that what you are saying?

24 **A.** That is what I am saying. Yes.

1 Q. Gotcha. How is the determination, if you know,
2 made to -- how is the determination made as to which
3 portions of the property are residential use versus
4 agricultural use? In other words, how are you determining
5 whether it's Class C or Class A?

6 A. So the primary method is through aerial
7 photography. So we'll look at aerial photography, and
8 usually the farm fields are pretty clearly designated.
9 You know, it's obviously green in there with buildings
10 that are probably mostly agricultural buildings; but, in
11 general, we'll consider those to be considered as
12 residential land uses.

13 Q. I am sorry. Go ahead.

14 A. Yeah. But I did go out, and I did verify that
15 what we are considering residential land use on ground is
16 residential land use.

17 Q. How did you do that verification?

18 A. By driving around each of the properties and
19 looking to see what buildings were there, whether there
20 was any encroachment of the lawn more than we see in the
21 aerial photograph.

22 There was -- I didn't do any measurements, but it
23 was just a visual inspection of all the properties.

24 Q. Did you talk to any of the homeowners?

1 **A. No, I didn't.**

2 **Q. Do you know when, for example, this particular**
3 photograph would have been taken?

4 **A. I don't know.**

5 **Q. Is it coming off of the GIS system?**

6 **A. Yes.**

7 **Q. All right. So it's taken off of the GIS flyover**
8 that is incorporated into the GIS mapping system that the
9 county might have? Am I understanding that correctly?

10 **A. It's -- I believe the map is from Esri, so it's a**
11 **map that is within our system based on public sources.**

12 **Q. Understood. When it comes to -- when it comes**
13 to, for example, this receptor, 00081, are there
14 atmospheric conditions that might push that 41-decibel
15 level onto that residential-use area that have not been
16 modeled?

17 **A. No. We are modeling under the worst-case**
18 **atmospheric condition. So we talked before about**
19 **refraction, so we are looking at downward refraction,**
20 **either through a temperature eversion or a downward**
21 **condition, and that would be the worst case.**

22 **Q. So, if I am understanding your testimony, your**
23 **testimony is you modeled it under the worst-case**
24 **conditions; is that what you are saying?**

1 **A. Yes. Worst-case sound power, worst-case**
2 **ecological conditions, and equivalent of hard ground.**

3 **Q. So, from, for example, the county's perspective,**
4 **one of the things that the county, of course, would want**
5 **to make sure of is to ensure that the residential-use**
6 **areas that are included in these contour maps, and**
7 **anywhere within the project, are actually, if it doesn't**
8 **become obstructed, that those sound limits are followed.**

9 And so my question to you is: How does Apex plan
10 to ensure to the county and the residents that the IPCB
11 limits, that these residential-use areas fall within the
12 IPCB limits? If you can answer that.

13 **A. I don't have an answer to that question. I just**
14 **was limited to the modeling, and we didn't talk about any**
15 **post-construction measurements.**

16 **Q. Let me ask this, I guess: Have you been involved**
17 **in doing sound studies on any type of project?**

18 **A. Yes.**

19 **Q. And how does the sound study work?**

20 **A. You are talking about a monitoring study?**

21 **Q. Correct.**

22 **A. Yeah. So I can go into a lot of detail, but I am**
23 **just trying to simplify it.**

24 Basically you choose areas on the land that you

1 want to put sound monitors; and in the IPCB standards, in
2 Section 9.10, there's basically a set of rules that you
3 have to follow, for what types of equipment you have to
4 use, and where monitors are set up, and how long you have
5 to measure for.

6 And then you would -- what we would do is we
7 would go out and measure the sound levels at the closest
8 portion of the residential land use that is facing the
9 turbines. So that would be the worst-case location of the
10 property line, and then try to pick a night where the
11 sound -- and we would do this at night typically because
12 that is when the worst-case complication conditions occur.
13 And then we would measure the sound for the specified time
14 and then take the data back to the office and process it.

15 Q. Okay. So, in terms of mitigation techniques that
16 might be available, I assume Apex would be willing to
17 implore those mitigation techniques, whether it's a
18 trailing serrated edge or it's a noise reduction?

19 A. My understanding is that they would implement --
20 the mitigation that is required would probably be coming
21 from us that would be required to meet the IPCB limits.

22 So the NRO -- if this was built as is today, the
23 NROs that we recommend would be implemented.

24 Q. If I understand it correctly, the contour maps

1 represent those locations where the receptor was within a
2 1-decibel level of the sound limits?

3 **A. Yes.**

4 **Q.** And my understanding is the most common one that
5 gets close is the 1,000 hertz?

6 **A. Yes.**

7 **Q.** And if I understand the study, or the modeling,
8 is that it was only the GE models that were close to that
9 1 decibel?

10 **A. That's right. None of the receptors, with the**
11 **Vestas turbines, were within 1 DB of the limit.**

12 **Q.** Okay. I just want to turn very quickly just to
13 some of the health information that was in the studies you
14 presented.

15 The one study from March of 2025, you are
16 familiar with that one? It is the one the author is -- I
17 don't know how to pronounce it -- Baliatsas,
18 B-a-l-i-a-t-s-a-s.

19 **A. That is the Netherlands study.**

20 **Q.** Yes. So my question: On the study, there is a
21 line both in the introduction and the conclusion, but the
22 line in the introduction states that epidemiological
23 research on specific health outcomes such as symptoms and
24 chronic diseases is still scarce and remains inconclusive.

1 Using distance to the nearest wind turbine or exposure to
2 modeled broadband sound pressure levels as exposure
3 surrogates, existing evidence generally shows no
4 consistent associations with acute symptomatology or
5 chronic conditions such as headache, dizziness, tinnitus,
6 sleep problems, heart diseases, or medication.

7 But my question, in relation to the first one is,
8 it makes it sounds like at this juncture it's
9 inconclusive. Are there any studies ongoing that you are
10 aware of that is aimed at resolving that open question?

11 A. I am sorry. I am just reading the paragraph.

12 Q. I am sorry.

13 A. So I read it, but I just need the question one
14 more time.

15 Q. Let me rephrase it.

16 A. Yeah.

17 Q. Based on the statements in the study, it sounds
18 as though there is still ongoing questions about whether
19 or not there might be long-term health effects related to
20 proximity to the wind turbines; is that fair?

21 A. I don't necessarily agree with that statement. I
22 think if you look at the -- at the -- even at what they
23 say, in all the studies that say -- if you look at page 5,
24 it lists one, two, three, four, five, six, seven, eight,

1 nine, ten, eleven, twelve, thirteen, fourteen, fifteen,
2 studies that show no chronic or acute health effects.

3 I think what they are talking about here is a
4 special type of epidemiological study, an epidemiological
5 study that looks at sound levels over time, and it's a
6 type of study which is probably a better type of study.

7 Their critique seems to be that we are looking at
8 a point in time, and we are looking at self-reported
9 outcomes, and we are focusing on annoyance.

10 So what they want to do is, you know, expand this
11 study to look at, you know, specifically at individuals
12 and health effects reported to their general
13 practitioners, and look at that data over time.

14 And I would agree that that tends to be lacking.
15 There's just two authors that do that type of study. One
16 is in Denmark, and one -- and, of course, these folks in
17 the Netherlands.

18 The problem is getting access to people's health
19 data, at least in the US, is very difficult; so we are
20 relying on these Denmark and Netherlands studies.

21 Q. The authors of the study, do you find those
22 authors to be authoritative on the subject matter?

23 A. Yes.

24 Q. In the conclusions, on page 7, there is a line

1 that states: Therefore, a possible impact of long-term
2 exposure to wind turbines on human health should not be
3 excluded.

4 Do you agree or disagree with that statement?

5 A. I don't agree with that statement; but if they
6 would like to go forward and do more studies, I am happy
7 to let them do it. I think they have come up with some
8 questions; they've come up with some additional
9 methodological problems in their study.

10 And, you know, I don't -- I agree that they can
11 go out and fix those methodological issues, and we could
12 get a better sense of or more surety of the overwhelming
13 data that has already been covered that there's no
14 association between wind turbines and health effects.

15 In terms of -- I am not an epidemiologist, and so
16 I am going to sort of stop my testimony there about -- but
17 they do talk about the problems with their study, but they
18 also do talk about the overwhelming evidence that has been
19 shown that there are no chronic or acute health effects,
20 but they have -- those studies haven't been done
21 essentially in large groups.

22 Q. Okay. Understood. Jumping back to the sound
23 modeling. On these sites, just by way of example, this
24 particular receptor site that is up right now, 00081, it

1 looks like the limit comes very close to the residential
2 use area; is that fair?

3 A. Yes.

4 Q. The best way to ensure that, if the project is
5 constructed, and it's constructed, assuming it's
6 constructed with a GE model, the best way to ensure that
7 that is within the IPCB limit would be to have some sort
8 of monitoring data that can ensure that they are within
9 that level; is that fair?

10 A. Certainly, monitoring would ensure that it would
11 meet the limits. We are pretty confident in the sound
12 modeling we did. We believe it's conservative, and it's
13 been shown to be conservative using the parameters we've
14 done in several studies. And certainly monitoring is one
15 way to assure that. So I guess the answer is it could.
16 Yes.

17 MR. KEYT: That's all the questions that I have.

18 MR. KAINS: All right. Very good. Thank you,
19 Mr. Keyt.

20 Redirect examination, Ms. Antoniolli?

21 MS. ANTONIOLLI: Yes. Thank you. I'll make this
22 quick.

23 FURTHER EXAMINATION

24 BY MS. ANTONIOLLI:

1 **Q.** So we did hear a question from Mr. Sherman
2 earlier tonight, and he posed a hypothetical, and this was
3 a question that we heard in various other ways tonight,
4 but it all comes to the same point about shadow flicker
5 and sound. So I want to make this clear for the record.

6 He raised the scenario, what would happen if
7 there was an issue with shadow flicker or noise that the
8 public became aware of, and that, in fact, even Apex
9 acknowledged. Do you recall that question?

10 **A.** Yes.

11 **Q.** Okay. And understanding that you are not an
12 attorney, but do you -- would you agree that, in general,
13 Apex and this wind project would have to comply with the
14 law?

15 **A.** Yes.

16 **Q.** So, in this case, we have the state statute that
17 sets shadow flicker limits on an annual basis and also
18 requires compliance with IPCB limits. We have the Coles
19 Wind Ordinance -- correct? -- that places requirements on
20 shadow flicker and sound?

21 **A.** That's correct.

22 **Q.** And would you agree that Coles Wind would need to
23 operate in compliance with the law?

24 **A.** Yes.

1 **Q.** So there would be ways to mitigate, and Coles
2 Wind would have to mitigate and have to comply with the
3 law in order to operate the wind project?

4 **A.** Yes.

5 MS. ANTONIOLLI: That's all.

6 MR. KAINS: Very good. Thank you.

7 Okay. Final questions for the witness come from
8 members of the Planning & Development Committee.
9 Anything?

10 MR. DOUGHTY: I do.

11 MR. KAINS: Okay. Mr. Doughty?

12 EXAMINATION

13 BY MR. DOUGHTY:

14 **Q.** So I want to ask you, last night, about
15 annoyances, and I used the term of psychosomatic, not
16 being condescending. You referred to it as subjective.

17 And so when I was just trying to read some of
18 this, in the -- I think it's the MIT study, on page E121,
19 in the second column -- so it's E121, the second column,
20 just in the middle of the page there where it says
21 noise-related annoyance, that sentence?

22 **A.** Yes.

23 **Q.** So down halfway or so, there's a sentence that
24 starts despite its subjective nature. Do you see where

1 I'm at?

2 A. Yes.

3 Q. Noise annoyance was included as the negative
4 health outcome by the World Health Organization, and the
5 recent review of the disease related to noise exposure.

6 And there is a siting there, 112.

7 So, when I looked at that, and read that abstract
8 and a little bit of that -- I am not an academic, but just
9 looking -- there was definite noise issues. It wasn't
10 wind turbines. It was air traffic, rail traffic, road
11 traffic, that had actual health issues with noise.

12 And so, since this is authored by you, I didn't
13 know how much that you looked at, and your colleagues
14 looked at, when it says -- and I know I am referring to a
15 study that we don't have on hand here, but it was -- do
16 you see what I am seeing?

17 A. Yes. Yeah.

18 Q. I was going to say I think they looked at a
19 European study, maybe, if I remember correctly.

20 So my question is about their findings according
21 to the World Health Organization that noise and health
22 issues are related. I didn't know. What would your
23 comment be on that, since you cited it in that report, or
24 this journal?

1 A. Let me answer two ways.

2 Q. Sorry.

3 A. I am trying to. It goes on to say, on page E125:
4 Whether annoyance is an adverse health effect, however, is
5 disputable. Annoyance is not listed in the International
6 Classification of Diseases, Tenth Edition. Although it
7 has been suggested by some that annoyance may lead to
8 stress and other health consequences such as sleep
9 disturbance --

10 MR. KAINS: Slow down, please.

11 THE WITNESS: Okay.

12 -- the proposed mechanisms, however, have not
13 been demonstrated in studies and the methods capable of
14 eliciting such pathways.

15 So there is a disagreement with WHO about whether
16 annoyance itself is a health effect.

17 And so this study typically concludes that there
18 is a difference of opinion and it's disputable, and I
19 think the reason is that, you know, there are annoyances.
20 Every day people have annoyances, and it's only when those
21 annoyances lead to health effects that that is the health
22 effect.

23 But WHO does regulate -- or does not regulate. I
24 am sorry. They provide guidelines for sound noise to

1 minimize the annoyance. For example, their 1999
2 guidelines on -- oh, my goodness -- they have noise
3 guidelines that they published in 1999. One of the
4 guidelines is for serious annoyance and moderate annoyance
5 on a property, and that guideline is 55 decibels average
6 during the day for serious annoyance and 50 decibels for
7 moderate annoyance; that is A-weighted decibels.

8 So the WHO does go further and provide guidelines
9 to minimize annoyance.

10 BY MR. DOUGHTY:

11 Q. So if you could interpret, or maybe I interpret,
12 would it be my interpretation of what you are saying would
13 be that maybe this article that I cited, it's 112, that is
14 cited in your journal, the WHO study, is that they maybe
15 missed a step of annoyance that causes the stress, or
16 whatever, which leads to a disease? Is that one?

17 A. I wouldn't want to criticize them by saying they
18 missed a step, but -- so the debate is whether annoyance
19 itself is a health effect, which seems to be the opinion
20 of WHO, and/or whether the health effects or the diseases,
21 essentially, that are outlined in the International
22 Classification of Diseases, and the authors of the MIT
23 study agree with the latter.

24 But as an example, the example I gave the WHO are

1 guidelines for moderate and serious annoyance. The sound
2 levels that are being proposed by this project would be
3 below those.

4 Q. Okay. Thank you. And my last line of questions
5 is by no means to impute who you are and what you do.

6 But in the 2022 study, you referred to it as the
7 2022 study, which is Ryan Haac, Ryan Darlow, yourself Ken
8 Kaliski, Joseph Rand, Ben Hoen, that starts: In the
9 shadow of wind energy.

10 A. Yes.

11 Q. All right. I am just going to page 14. This is
12 a question that I get when I talk with people, so I am
13 just giving you a chance to either clarify or explain what
14 this is.

15 On the declaration of competing interests, it
16 says: The authors have no affiliation with any
17 organization with a direct or indirect financial interest
18 in the subject matter discussed in the manuscript.

19 And so you have these studies, which you are an
20 expert. Once again, I don't mean to impute, but what does
21 that mean when it says no affiliation with any
22 organization with a direct or indirect financial interest?
23 And why state that when RSG is involved?

24 A. So, as an example, we are not members of the ACP,

1 American Clean Power, which is the deal we have with
2 American Wind Energy Association. And we believe that,
3 you know, if we were to, say, be a member of that
4 organization, which is a proponent of wind power, I think
5 that would create a bias. So we try to stay away from
6 becoming members of organizations that are promoting one
7 activity or another.

8 We certainly do work for -- as engineers, we've
9 worked for wind turbine developers, we've worked for
10 municipalities, and we've worked for state governments.
11 So I don't see that as a conflict of interest.

12 But we certainly don't work or belong to any
13 organizations that essentially, as they say here, have a
14 direct or indirect financial interest in the subject
15 matter.

16 MR. KAINS: Could you keep your voice up. I am having
17 a hard time hearing you, and I'm only six feet away.

18 THE WITNESS: My voice is gone a little bit.

19 MR. KAINS: I know. You've done a great job tonight.

20 Go ahead with your answer, though.

21 THE WITNESS: So, in that way, we don't have a
22 conflict of interest.

23 MR. DOUGHTY: Thank you.

24 MR. KAINS: Thank you, Mr. Doughty.

1 Any other questions from members of the committee
2 for Mr. Kaliski?

3 Thank you, folks.

4 Mr. Kaliski, thank you very much for being on the
5 witness stand for three and a half hours.

6 THE WITNESS: Thank you.

7 MR. KAINS: Thank you. You might set a record in your
8 field.

9 All right. He's done on the witness stand.

10 When we come back tomorrow, 6:00 p.m., we will
11 have questions, cross-examination, for Jason Conley, the
12 gentleman who is the Director of Environmental Health and
13 Safety for Apex. He testified last night. He will have
14 questions tomorrow. We'll start with the public, and then
15 there will be questions from Coles County staff and
16 consultants, redirect examination from Apex counsel, and
17 then questions, final questions, from the committee
18 members.

19 Now, Mr. Hess?

20 MR. HESS: Yes, sir.

21 MR. KAINS: After Mr. Conley, who do you propose to
22 call tomorrow night?

23 MR. HESS: We have two remaining witnesses. Ms. Kelly
24 McQue is our decommissioning expert. She is here to

1 discuss her cost calculations.

2 And Mr. Adam Carlson, who is our Project Manager,
3 he built Prosperity Wind and hopes to build Coles Wind.

4 MR. KAINS: At the rate we are going, we may only get
5 to Mr. Conley and one of those witnesses.

6 But, folks in the public, decommissioning is on
7 the table potentially for testimony tomorrow night, and
8 also construction of this project, should it go forward.

9 All right. So we will have questions first up
10 from Mr. Conley, the occupational health and safety expert
11 tomorrow night.

12 The Planning & Development Committee of the Coles
13 County Board is in recess until tomorrow evening at six
14 o'clock p.m., in this very courtroom, in the Coles County
15 Courthouse, on Jackson Street. Thank you.

16 (PROCEEDINGS RECESSED UNTIL 5/17/2025 6:00 P.M.)
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