

South Dakota Public Utilities Commission

EL19-027 - In the Matter of the Application by Crowned Ridge Wind II, LLC for a Permit of a Wind Energy Facility in Deuel, Grant and Codington Counties – Evidentiary Hearing

February 5th, 2020

Matthew Training Center – Foss Building, 523 E. Capitol Ave., Pierre, S.D.

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Full Name	City/State
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Andy Rall	Goodwin, SD
Rich Rall	Goodwin SD
Richard Lampeter	Maynard, MA
Christopher Ollson	Ancaster, ON, CANADA
Jay Haley	Grand Forks, ND
AJ Swanson	Canton SD
Jillian Still	Juno Beach FL
Brian Murphy	Juno Beach FL
Lauren Krill	Juno beach, FL
Amber Christenson	Strandburg SD
ALLEN ROBISH	STRANDBURG SD
Sarah Suppington	Bismarck, ND
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David Gil	Juno Beach, FL
David Stephen Goodin	Alexandria, VA

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Full Name

City/State

John Homan

Watertown, SD

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DAVID HESSLER

ST. GEORGE, UT

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Volume II, Pages 251-522

Reported By Cheri McComsey Wittler, RPR, CRR
Precision Reporting, 213 S. Main, Onida, South Dakota

1 The following transcript of proceedings was
2 held in the above-entitled matter at the Matthew Training
3 Center, Joe Foss Building, 523 East Capitol Avenue,
4 Pierre, South Dakota, on the 5th day of February, 2020,
5 commencing at 8:30 a.m.

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12
13
14
15
16
17
18
19
20
21
22
23
24
25

I N D E X

2	APPLICANT'S WITNESSES	PAGE
3	TYLER WILHELM	
4	Direct Examination by Mr. Murphy	29
	Cross-Examination by Mr. Swanson	32
5	Cross-Examination by Ms. Christenson	46
	Cross-Examination by Mr. Robish	73
6	Cross-Examination by Ms. Reiss	74
	Commissioner Questions	81
7	Redirect Examination by Mr. Murphy	98
	Recross-Examination by Ms. Christenson	104
8	Recross-Examination by Ms. Reiss	105
9	DARYL HART	
10	Direct Examination by Mr. Murphy	111
	Cross-Examination by Mr. Swanson	113
11	Cross-Examination by Ms. Christenson	114
	Cross-Examination by Ms. Reiss	126
12	Commissioner Questions	128
13	MICHAEL MAROUS	
14	Direct Examination by Mr. Schumacher	131
	Cross-Examination by Mr. Swanson	136
15	Cross-Examination by Ms. Christenson	140
	Cross-Examination by Mr. Robish	146
16	Cross-Examination by Ms. Edwards	150
	Commissioner Questions	152
17	MARK THOMPSON	
18	Direct Examination by Mr. Murphy	170
19	Cross-Examination by Ms. Christenson	173
	Cross-Examination by Mr. Robish	194
20	Cross-Examination by Ms. Reiss	196
	Commissioner Questions	201
21	Redirect Examination by Mr. Murphy	213

1	<u>I N D E X (Continued)</u>	
2	APPLICANT'S WITNESSES	PAGE
3	JAY HALEY	
4	Direct Examination by Mr. Murphy	215
	Cross-Examination by Mr. Swanson	220
5	Cross-Examination by Ms. Christenson	227
	Cross-Examination by Ms. Edwards	243
6	Further Direct Examination by Mr. Murphy	262
	Commissioner Questions	263
7	Redirect Examination by Mr. Murphy	275
	Recross-Examination by Mr. Swanson	277
8	Recross-Examination by Ms. Christenson	283
	Recross-Examination by Mr. Robish	292
9	Recross-Examination by Ms. Edwards	294
10	RICH LAMPETER	
11	Direct Examination by Mr. Schumacher	301
	Cross-Examination by Mr. Swanson	302
12	Cross-Examination by Ms. Christenson	313
	Cross-Examination by Ms. Edwards	315
13	Commissioner Questions	316
14	ROBERT MCCUNNEY	
15	Direct Examination by Mr. Murphy	321
	Cross-Examination by Ms. Christenson	324
16	Commissioner Questions	326
17	CHRISTOPHER OLLSON	
18	Direct Examination by Mr. Murphy	333
	Cross-Examination by Mr. Swanson	337
19	Cross-Examination by Ms. Christenson	355
	Cross-Examination by Mr. Robish	367
20	Cross-Examination by Ms. Edwards	369
	Commissioner Questions	371
21		
22		
23		
24		
25		

1	<u>I N D E X (Continued)</u>	
2	APPLICANT'S WITNESSES	PAGE
3	SARAH SAPPINGTON	
4	Direct Examination by Mr. Schumacher	375
	Cross-Examination by Ms. Christenson	378
5	Cross-Examination by Ms. Reiss	388
	Commissioner Questions	395
6	TYLER WILHELM	
7	Commissioner Questions	407
8		
9	INTERVENORS' WITNESSES	PAGE
10	GARRY EHLEBRACHT	
11	Direct Examination by Mr. Swanson	423
	Cross-Examination by Ms. Christenson	429
12	Cross-Examination by Ms. Edwards	430
	Commissioner Questions	431
13	AMY RALL	
14	Direct Examination by Mr. Swanson	439
15	Commissioner Questions	442
16	TYLER WILHELM	
17	Direct Examination by Mr. Swanson	446
18	Commissioner Questions	450
19	STAFF'S WITNESSES	PAGE
20	DAVID LAWRENCE	
21	Direct Examination by Ms. Edwards	452
	Cross-Examination by Mr. Swanson	459
22	Cross-Examination by Ms. Christenson	463
	Commissioner Questions	469
23	Redirect Examination by Ms. Edwards	489
	Recross-Examination by Ms. Christenson	490
24		
25		

1	<u>I N D E X (Continued)</u>	
2	STAFF'S WITNESSES	PAGE
3	DAVID HESSLER	
4	Direct Examination by Ms. Edwards	494
	Cross-Examination by Mr. Swanson	497
5	Cross-Examination by Ms. Christenson	508
	Cross-Examination by Mr. Robish	511
6	Commissioner Questions	514
	Redirect Examination by Ms. Edwards	518
7		
8	PAIGE OLSON	
	Direct Examination by Ms. Reiss	534
9	Commissioner Questions	537
10	HILARY MOREY	
11	Direct Examination by Ms. Reiss	539
	Commissioner Questions	542
12	Redirect Examination by Ms. Reiss	549
13	DARREN KEARNEY	
14	Direct Examination by Ms. Reiss	550
	Cross-Examination by Mr. Swanson	560
15	Cross-Examination by Ms. Christenson	580
	Cross-Examination by Mr. Robish	608
16	Commissioner Questions	616
17		
18		
19		
20		
21		
22		
23		
24		
25		

I N D E X (Continued)

APPLICANT'S EXHIBITS

A1	Crowned Ridge Application
A1-A	Appendix A - Figures 1 through 14
A1-B	Appendix B - Agency Coordination Dates and Correspondence
A1-C	Appendix C - Aquatic Resources Survey Report
A1-D	Appendix D - Bat Acoustic Survey Report
A1-E	Appendix E - Bat Habitat Assessment Report
A1-F	Appendix F - Dakota Skipper-Poweshiek Skipperling Survey Report
A1-G	Appendix G - Raptor Nest Survey Report
A1-H	Appendix H - Avian Use Survey Report
A1-I	Appendix I - Sound Level Modeling Report
A1-J	Appendix J - Shadow Flicker Modeling Report
A1-K	Appendix K - County Conditional Use Permits
A1-L	Appendix L - Property Value Effect Studies
A1-M	Appendix M - Telecommunication Studies
A1-N	Appendix N - Decommissioning Plan
A1-O	Appendix O - Cultural Confidential
A2	Direct Testimony Jay Haley
A3	Direct Testimony Sarah Sappington
A4	Direct Testimony Mark Thompson
A4-1	Exhibit MT-1: Resume of Mark Thompson
A5	Direct Testimony Tyler Wilhelm
A5-1	Exhibit TW-1: Resume of Tyler Wilhelm
A6	Direct Testimony Daryl Hart
A6-1	Exhibit DH-1: Resume of Daryl Hart
A6-2	Exhibit DH-2: Tax Revenues
A7	Direct Testimony and Exhibit Rich Lampeter
A7-1	Exhibit RL-1: Resume of Richard Lampeter
A7-2	Exhibit RL-2: Proposed Postconstruction Sound Protocol
A7-3	Exhibit RL-3: Low Frequency Noise and Infrasound from Wind Turbines
A8	CRW, LLC's Letter regarding Updates to Original Application
A9	CRW, LLC's Letter regarding Dropped and Moved Turbines
A10	CRW Letter, Notice Letter, and Affidavit on Notice of Public Input Hearing
A11	PUC Affidavits of Publication
A12	Supplemental Testimony of Chris Ollson
A12-1	Exhibit CO-S-1: Curriculum Vitae

I N D E X (Continued)

APPLICANT'S EXHIBITS

- A12-2 Exhibit CO-S-2: Exposure to Wind Turbine Noise
- A12-3 Exhibit CO-S-3: Effects of Wind Turbine Noise on Self-Reported and Objective Measures of Sleep
- A12-4 Exhibit CO-S-4: Before-After Field Study of Effects of Wind Turbine Noise on Polysomnographic Sleep Parameters
- A12-5 Exhibit CO-S-5: Impact of Wind Turbine Sound on Annoyance, Self-Reported Sleep Disturbance and Psychological Distress
- A12-6 Exhibit CO-S-6: The Association Between Self-Reported and Objective Measures of Health and Aggregate Annoyance Scores Toward Wind Turbine Installations
- A12-7 Exhibit CO-S-7: Health-Based Audible Noise Guidelines Account for Infrasound and Low-Frequency Noise Produced by Wind Turbines
- A12-8 Exhibit CO-S-8: Low-Frequency Noise Incl. Infrasound from Wind Turbines and Other Sources
- A12-9 Exhibit CO-S-9: An Assessment of Quality of Life Using the WHOQOL-BREF Among Participants Living in the Vicinity of Wind Turbines
- A12-10 Exhibit CO-S-10: Monitoring Annoyance and Stress Effects of Wind Turbines on Nearby Residents
- A12-11 Exhibit CO-S-11: Health Effects and Wind Turbines: A Review of the Literature
- A12-12 Exhibit CO-S-12: Wind Turbines and Photosensitive Epilepsy
- A12-13 Exhibit CO-S-13: Wind Turbines, Flicker, and Photosensitive Epilepsy
- A12-14 Exhibit CO-S-14: Potential of Wind Turbines to Elicit Seizures Under Various Meteorological Conditions
- A12-15 Exhibit CO-S-15: Update of UK Shadow Flicker Evidence Base
- A12-16 Exhibit CO-S-16: Information on How to Identify and Assess Optical Emissions Wind Turbines
- A13 Supplemental Testimony Daryl Hart
- A13-1 Exhibit DH-S-1: Generator Interconnection Agreement

I N D E X (Continued)

APPLICANT'S EXHIBITS

A13-2 Exhibit DH-S-2: Maps depicting 200 MW array
and potential deferral of 100 MWs

A13-3 Exhibit DH-S-3: Explanation of Turbine Status
Change

A14 Supplemental Testimony Jay Haley

A14-1 Exhibit JH-S-1: Final Report CRW II Sound
Study Codington, Deuel, and Grand Counties

A14-2 Exhibit JH-S-2: Final Report CRW II Shadow
Flicker Study Codington, Deuel, and Grant

A14-3 Exhibit JH-S-3: CRW II 200 MW Sound Level
Tabular Results Sorted by Receptor ID
Realistic Case Sound Result at Land Parcel

A14-4 Exhibit JH-S-4: CRW II 200 MW Shadow Flicker
Tabular Results Sorted by Receptor ID Realistic
case shadow results at occupied structures
Results using GE 2.3-116-90m HH, GE 2.1-116-80
m HH WTG's UTM NAD83 Zone 14 Codington Co.

A15 Supplemental Testimony Mark Thompson

A16 Supplemental Testimony Michael MaRous

A16-1 Exhibit MM-S-1: Market Impact Analysis

A17 Supplemental Testimony Robert McCunney

A17-1 Exhibit RM-S-1: Curriculum Vitae

A17-2 Exhibit RM-S-2: Exposure to Wind Turbine Noise

A17-3 Exhibit RM-S-3: Wind Turbines and Health

A17-4 Exhibit RM-S-4: Health Effects Related to Wind
Turbine Sound, Including Low-Frequency Sound
and Infrasound

A17-5 Exhibit RM-S-5: Measurement and Level of
Infrasound from Wind Farms and Other Sources

A17-6 Exhibit RM-S-6: Low Frequency Noise and
Infrasound from Wind Turbines

A17-7 Exhibit RM-S-7: Potential of Wind Turbines to
Elicit Seizures Under Various Meteorological
Conditions

A18 Supplemental Testimony of Sarah Sappington

A18-1 Exhibit SS-S-1: SD State Historical Society's
Letter to SWCA regarding Archaeological and
Traditional Cultural Property Inventory,
CRW II Wind Turbine Array

A18-2 Exhibit SS-S-2: SD State Historical Society's
Letter to SWCA regarding Architectural
Resources Assessment

I N D E X (Continued)

APPLICANT'S EXHIBITS

A19 Supplemental Testimony Tyler Wilhelm
 A19-1 Exhibit TW-S-1: Deuel Co. Ord. B2004-01-23B
 A19-2 Exhibit TW-S-2: Map Land Status
 A19-3 Exhibit TW-S-3: Grant Co. Ord. 2016-01C
 A19-4 Exhibit TW-S-4: List of Primary and Alternate
 Turbine Locations and Dropped Turbines
 A20 Rebuttal Testimony Christopher Ollson
 A21 Rebuttal Testimony Jay Haley
 A21-1 Exhibit JH-R-1 Sound modelled with Hessler
 and CRW proposal
 A21-2 Exhibit JH-R-2 Shadow Flicker modelled with
 Hessler and CRW proposal
 A21-3 Exhibit JH-R-3 Intervenor results with
 Hessler and CRW proposal
 A22 Rebuttal Testimony of Michael MaRous
 A23 Rebuttal Testimony of Richard Lampeter
 A24 Rebuttal Testimony of Sarah Sappington
 A25 Rebuttal Testimony of Mark Thompson
 A26 Rebuttal Testimony of Tyler Wilhelm
 A27 Supplemental Response to Intervenor IR 2-15
 A27-1 Attachment 1 Map
 A27-2 Attachment 2 Map

INTERVENORS' EXHIBITS

I-1 Affidavit of Garry Ehlebracht
 I-2 Wind Farm Lease and Easement Agreement
 I-3 Application for Party Status (Corrected)
 I-4 Affidavit of Laretta Kranz
 I-5 Affidavit of Steven Greber
 I-6 Affidavit of Amy Rall

CHRISTENSON'S EXHIBITS

AC-1 A Cooperative Measurement Survey and Analysis
 of Low Frequency and Infrasound at the Shirley
 Wind Farm in Brown County, WI
 AC-2 McPherson 6 18 May
 AC-3 Riina_Bray_IWT_Niagara
 AC-4 Applicant's Responses to Christenson's DR

I N D E X (Continued)

CHRISTENSON'S EXHIBITS

AC-5 Applicant's Responses to Staff's Third Set
AC-6 Attachment 1 to Staff DR 3-2
AC-7 Attachment 1 to Staff DR 3-8
AC-8 Applicant's Supplemental Responses to Staff's
Second Set of DR
AC-9 Applicant's Responses to Intervenors' Second
Set of DR(4)
AC-10 MN-buyout-20186-143575-01
AC-11 Attachment 1 to Intervenor 2-2
AC-12 Attachment 1 to Intervenor 2-10
AC-13 Attachment 1 to Intervenor 2-16
AC-14 Attachment 1 to Intervenor 1-1 Applicant's
Responses to Staff's First Set of DR
AC-15 Attachment 1 to Intervenor 1-4 Part 1

STAFF'S EXHIBITS

S1 Prefiled Testimony and Exhibits Darren Kearney
S2 Prefiled Testimony and Exhibits Darren Kearney
(Confidential)
S3 Prefiled Testimony and Exhibits of Hilary Morey
S4 Prefiled Testimony and Exhibits of Paige Olson
S5 Prefiled Testimony and Exhibits of David
Lawrence
S6 Prefiled Supplemental Testimony of David
Lawrence
S7 Proposed Permit Conditions

1 MS. CREMER: Good morning, everyone. We are on
2 day two, and I will call the hearing back to order in
3 Docket EL19-027, In the Matter of the Application by
4 Crowned Ridge Wind II, LLC for a Permit of a Wind Energy
5 Facility in Deuel, Grant, and Codington Counties.

6 When we went into recess last night we were in
7 the midst of the direct case of Crowned Ridge. And I
8 understand that Mr. Murphy would like to clarify. And,
9 Mr. Haley, you can come back up to the witness stand.
10 I'll remind you you're still under oath.

11 MR. MURPHY: Thank you. I'd like to clarify
12 through Mr. Haley statements he made yesterday before we
13 go to Commissioners' questions just to hopefully resolve
14 any confusion.

15 FURTHER DIRECT EXAMINATION

16 BY MR. MURPHY:

17 Q. Yesterday in response to questions you were asked
18 whether Dakota Range turbines were included in your
19 studies.

20 Can you elaborate on correcting that statement?

21 A. Yes. The Dakota Range turbines are not included in
22 the Crowned Ridge II study. I think when she said Dakota
23 Range my brain heard Deuel Harvest. But, in fact, the
24 Deuel Harvest turbines were included, not Dakota Range.

25 MR. MURPHY: Thank you.

1 MS. CREMER: All right. With that then, we are
2 at Commission questions. And this is great. We are at
3 Commissioner sharp eyes to ask questions first here.

4 COMMISSIONER NELSON: Stepping forward, I think.

5 Really the only question I've got revolves
6 around shadow flicker. And as you were explaining it
7 yesterday -- and, you know, we've heard some of this
8 testimony before, but I think maybe a light bulb came on
9 for me yesterday.

10 So if your modeling shows that a receptor would
11 have 30 hours of shadow flicker a year, really depending
12 on the windows in the house and what's around that house
13 and where the windows are, they may well have 30 hours of
14 shadow flicker coming through their biggest picture
15 window; is that correct?

16 THE WITNESS: Yes. That would be correct.

17 COMMISSIONER NELSON: Or they may have
18 absolutely none in their house if there are not windows
19 or those windows are shaded by trees or other structures;
20 is that correct?

21 THE WITNESS: Yes. That is correct.

22 COMMISSIONER NELSON: And so I think the
23 revelation for me is when you see those numbers on the
24 paper you just automatically assume that's going to be
25 what's going to happen. But there's a whole lot of

1 realities that need to be looked at for each individual
2 receptor for an individual to know exactly how it's going
3 to impact their location; is that correct?

4 THE WITNESS: That is correct. And that's why
5 we use the greenhouse sensor; because it's so much more
6 conservative. It assumes that there's going to be shadow
7 everywhere when in reality there isn't.

8 COMMISSIONER NELSON: Thank you. I don't have
9 any other questions.

10 COMMISSIONER FIEGEN: Good morning.

11 THE WITNESS: Good morning.

12 COMMISSIONER FIEGEN: I heard you talk about it,
13 but when I read your Supplemental Testimony of
14 September 20, on page 17 you talk about shadow flicker.
15 Well, it's not page 17. That's not correct at all. It's
16 page 2 of 6, I guess. I don't know why I had 17 in the
17 corner here.

18 You talk about Turbine 77 being at 32 hours and
19 32 minutes. And then also you talked about Alt. 3 in
20 your -- I don't know if it was in your opening statement
21 or if it was some of the cross. Can you just tell me
22 about those two turbines? Because are those pretty much
23 the two turbines that --

24 And then it kind of talks about not being
25 curtailed and -- can you just bring me up to speed on

1 Alt. 3 and, I think, Turbine 77 that may have more than
2 30 hours? And if there's any others.

3 THE WITNESS: Well, it wouldn't have been
4 Turbine 77.

5 COMMISSIONER FIEGEN: Oh. Receptor. Right.

6 THE WITNESS: We're talking receptors. So I'm
7 not sure what receptor that would have been.

8 COMMISSIONER FIEGEN: That's what I was going to
9 ask you.

10 THE WITNESS: But I do have in my notes here, if
11 this will help, for the 300 megawatt proposal that we're
12 discussing here, Receptor No. CR1-C10-P is the receptor
13 with the highest amount of shadow flicker hours which
14 is --

15 COMMISSIONER FIEGEN: Could you tell me one more
16 time? I didn't write that down.

17 THE WITNESS: Sure. CR1-C10-P. And that
18 turbine is being affected by CR2-ALT.3, the turbine
19 number CR2-ALT.3. And the total shadow flicker is
20 projected to be 38 hours and 20 minutes.

21 And it's important to note also that that
22 CR2-ALT.3 turbine is in the 100 megawatt portion of the
23 project.

24 COMMISSIONER FIEGEN: And then explain to me
25 what you're doing about that. Are you curtailing so

1 it's --

2 THE WITNESS: Yes. The plan would be to
3 curtail, you know, 8 hours and 20 minutes a year, at a
4 minimum.

5 COMMISSIONER FIEGEN: Okay. So I'm going to
6 look something up so I'm going to pass, and I might come
7 back after Commissioner Hanson.

8 Thank you.

9 CHAIRMAN HANSON: Good morning, Mr. Haley.

10 THE WITNESS: Good morning.

11 CHAIRMAN HANSON: On page 3 of your Direct
12 Testimony you spoke of sensitivity of the human ear and
13 stated that -- on line 26 that between 30 and 40 dBA is
14 comparable to the ambient sound levels in a quiet rural
15 area. That's a pretty wide range, 30 to 40.

16 Do you have an idea of which end of that
17 spectrum it's on? Is it closer to 30 or closer to 40?
18 Is it 40 when there's a truck driving by? Is it 30 --

19 THE WITNESS: I don't know that you could really
20 get that precise about it. It's just going to be a
21 range. You know, the conditions are so variable that I
22 don't think you could pinpoint it to that tight of a
23 level.

24 CHAIRMAN HANSON: Really? Yet we talk about
25 cutting it off at 40 and 42 and 45.

1 THE WITNESS: Well, but I'm talking about to
2 pinpoint some -- a characterization of a typical sound
3 level. Like a refrigerator in your kitchen, is it
4 35 decibels or 45 decibels?

5 Well, it could be anywhere within that range
6 depending on your actual situation.

7 CHAIRMAN HANSON: Well, in your experience what
8 is it closer to? Have you measured this a great deal?

9 THE WITNESS: What would what be closer to?

10 CHAIRMAN HANSON: The ambient noise in a rural
11 area.

12 THE WITNESS: 30 to 35.

13 CHAIRMAN HANSON: Okay. Thank you.

14 In all of your studies did you study sleep
15 deprivation at all?

16 THE WITNESS: No. That's not a part of my
17 practice.

18 CHAIRMAN HANSON: Okay. And you didn't study
19 that in mechanical engineering school, I don't imagine?

20 THE WITNESS: No. I had some sleep deprivation.

21 CHAIRMAN HANSON: Well, we all did last night, I
22 think.

23 You said -- and perhaps I didn't catch it
24 properly, but I heard you say that snow absorbs sound.

25 THE WITNESS: Yes, it does.

1 CHAIRMAN HANSON: Does it absorb very much
2 sound?

3 THE WITNESS: Yeah. Snow is considered to be
4 one of the more sound absorbing materials.

5 CHAIRMAN HANSON: It just seems intuitively
6 inaccurate just on the basis of thinking of grass and
7 dirt and leaves in the trees and all of that sort of
8 thing that sound would not be -- or snow would not be
9 absorbing.

10 And in personal experiences probably when
11 there's just a tiny little bit of crust on top of the
12 snow one can hear for a long, long distance very
13 plainly.

14 THE WITNESS: It would depend on the types of
15 snow. You know, there's the fluffy powder snow in the
16 Montana mountains, and then there's the wind-driven snow
17 in the prairies. So it will be a range there. But,
18 generally speaking, the snow absorbs. It doesn't
19 reflect.

20 CHAIRMAN HANSON: Well, how about the snow in
21 South Dakota, driven on the plains after a sunny day and
22 it's got a crisp layer of thin ice on the top? Doesn't
23 that just not absorb very much?

24 THE WITNESS: Well, it would certainly absorb
25 less than the powder snow in the mountains in Montana.

1 CHAIRMAN HANSON: Mr. Swanson in questioning you
2 used the word fudge factor. Is an analysis of -- is
3 there experience that enters into an analysis, or do you
4 just put these are -- this is the data that I have, and
5 that's what -- that's the decision?

6 THE WITNESS: No. There is experience. You're
7 talking about the ground attenuation factor of 0.5, I
8 assume?

9 CHAIRMAN HANSON: Correct.

10 THE WITNESS: That's been empirically verified
11 over time that when you use that value in conjunction
12 with the other conservative assumptions you're going to
13 get the most accurate prediction that would match what is
14 actually measured in the field at any given time.

15 CHAIRMAN HANSON: Could then the experience of
16 one mechanical or wind engineer, as we were referring to,
17 differ from another wind engineer?

18 THE WITNESS: Yeah. You're not going to get --
19 you know, I mean, just the nature of measurements is
20 basically that, you know, no two people that take a
21 measurement are going to get exactly the same answer.
22 That's just the way it works.

23 CHAIRMAN HANSON: It appeared that you took a
24 conservative approach on a number of areas here. Do you
25 feel that you took the most conservative approach or

1 middle of the road or --

2 THE WITNESS: I would say, no, it was certainly
3 not the most conservative. If we did that, you probably
4 wouldn't have, you know, 12 turbines in the project. But
5 it's a middle of the road conservative approach is what I
6 would describe it as.

7 CHAIRMAN HANSON: Ms. Christenson queried you on
8 a real interesting thought that had never occurred to me,
9 and that was the moon flicker.

10 THE WITNESS: Oh, yeah.

11 CHAIRMAN HANSON: Never even thought of that.
12 Is there such a thing?

13 THE WITNESS: No, there is not. It's come up in
14 other hearings. At one point it peaked my curiosity. So
15 I waited -- I live across from the school so there's a
16 wide open soccer field across from my house.

17 So there was a perfectly clear night, and it was
18 a super moon so it was about as bright as you're going to
19 get. I went out there with a big wide stick out in the
20 middle of the field and tried to see what I could see for
21 a shadow. And you can see a little bit of a shadow, but
22 the intensity of it is so incoherent that it's not going
23 to create a shadow -- or a shadow flicker, I should say.

24 But yeah. You can see a shadow from a full
25 moon.

1 CHAIRMAN HANSON: Okay. So if you can see a
2 shadow for a full moon, wouldn't you be able to see a
3 flicker?

4 THE WITNESS: No. Flicker can't occur unless
5 there's enough difference in the light intensity between
6 the light and the shadow. And when you get -- in the
7 case of wind turbines when you get far enough away from
8 that wind turbine that shadow has defused through the
9 atmosphere to the point that it no longer has enough
10 intensity to create that flickering effect.

11 CHAIRMAN HANSON: So you're saying then that the
12 turbine blades would have to be fairly close to the
13 receptor.

14 THE WITNESS: Yeah. If you think of -- if you
15 take a ruler and pretend that's the wind turbine blade
16 and you look at a light bulb and you put that ruler in
17 front of you and you try to block the light, the farther
18 you put that ruler away from your face, the thinner the
19 ruler is going to appear and the less amount of the light
20 bulb that's going to block; right?

21 CHAIRMAN HANSON: Yeah.

22 THE WITNESS: As you bring that ruler closer to
23 you, you can get to the point where you can completely
24 block out that light bulb. That's the relationship
25 that's going on between the wind turbine and the observer

1 at their house. So when that house is far enough away
2 from that turbine at some point there's not enough
3 intensity left in that shadow to create a flicker.

4 CHAIRMAN HANSON: Is there a decrease of half --
5 I'm trying to remember my photography years and exposure
6 to print.

7 There's a decrease on distance of like
8 50 percent for every -- can you help me out there?

9 THE WITNESS: Yeah. I'm a photographer too, but
10 I can't tell you. I think light falls off to the fourth
11 power or something to that effect.

12 But what I can tell you is that in relation to
13 wind farm design there is a distance at which we can
14 calculate where beyond that distance the shadow does not
15 have enough intensity to cause flicker.

16 And, like I mentioned yesterday, the software
17 that we use does perform that calculation. So if there
18 are receptors that are beyond that distance, it will
19 assume that the flicker at that point is zero. And for
20 this project, based on the width of that blade, that
21 distance is about 1,700 meters, which is a little over a
22 mile.

23 CHAIRMAN HANSON: Okay. Thank you very much.
24 Commissioner Fiegen.

25 COMMISSIONER FIEGEN: I'm coming back to my

1 question because I think I must have misstated something.

2 We're going to go to your Supplemental
3 Testimony.

4 THE WITNESS: Okay.

5 COMMISSIONER FIEGEN: And if you could pull that
6 up so that -- it is September 20. And I want to go to
7 page 2.

8 THE WITNESS: My testimony. Okay.

9 COMMISSIONER FIEGEN: Well, it's a Supplemental
10 Testimony. It's not your --

11 You submitted it in September. On page 2 of 6
12 it says Jay --

13 MR. SWANSON: It's marked A14.

14 COMMISSIONER FIEGEN: What was it? Oh, A14.
15 See. A.J.'s helping me out.

16 MR. SWANSON: Happy to help.

17 COMMISSIONER FIEGEN: I just assumed you would
18 have all your testimony right by you.

19 THE WITNESS: It should have been in the book,
20 but I can't find it.

21 COMMISSIONER FIEGEN: Okay. On page 2, lines 19
22 to 23, I'm just going to have you read that. Not in the
23 record but just so that I can have you clarify that.

24 THE WITNESS: So paragraph 19 to 23, "With
25 respect to the shadow flicker for the entire

1 300 megawatts, there is one exceedance of the 30-hour
2 annual limit. The exceedance is for Receptor CR2-C98-NP,
3 which would experience 32 hours and 22 minutes per year.
4 In this case it is my understanding from discussions with
5 the Witness Wilhelm and Hart that the Turbine No. CR2-77
6 will be curtailed to limit the flicker impacts to less
7 than 30 hours per year."

8 COMMISSIONER FIEGEN: So although that may be an
9 alternate turbine -- so you will curtail that one too, if
10 it is built or --

11 THE WITNESS: Just to back up for a minute, this
12 is the Supplemental Testimony. So this is dealing with
13 the split of the 300-megawatt project into a 200 and a
14 100. Subsequent to that, we filed the Rebuttal Testimony
15 to address the Hessler alternatives.

16 So the latest results that we're dealing with
17 are based on our counterproposal to the Hessler proposal.
18 And in that there is no flicker at this -- there is no
19 exceedance at this receptor.

20 COMMISSIONER FIEGEN: Oh, okay. So if I have
21 more questions, Mr. Hessler, I guess, is going to get
22 them. So thank you.

23 THE WITNESS: Thank you.

24 MS. CREMER: Mr. Murphy, did you have anymore
25 redirect?

1 MR. MURPHY: I do. Actually I'm going to pick
2 up on that last question because my redirect is for
3 clarification.

4 REDIRECT EXAMINATION

5 BY MR. MURPHY:

6 Q. The first one is for the Commissioner. She asked if
7 Turbine 77 was built, even though it is currently an
8 alternate in the Hessler proposal, would there be a need
9 to curtail?

10 I just want you to think that through. Because I
11 think I know the answer, I think you know it, but I don't
12 think that was the answer you provided.

13 A. So what you're saying is if we build the Crowned
14 Ridge alternative to the Hessler proposal 200?

15 Q. No. What I'm saying -- let me walk you through it.

16 So under our proposal --

17 COMMISSIONER FIEGEN: I'm so glad there's
18 another person that can ask my question.

19 MR. MURPHY: I just feel an obligation for you
20 all to have a clear record for your decision. And since
21 I live this every day --

22 Q. So under the proposal and the study of the Hessler
23 proposal and what we've put into stipulated conditions
24 that haven't been entered into the record yet but are
25 proposed to enter into the record, we would make

1 primaries Turbines 97, 94, 134, and Alternate 6. What we
2 would make as alternates are 13, 72, 77, and Alt. 5.

3 So what you did is a study that essentially took
4 those alternates out that showed a differential. Am I
5 correct?

6 A. Yes. That is correct.

7 Q. However, if in the end alternate -- what we're
8 calling Alternate now 77 was built, would there need to
9 be a curtailment of that turbine?

10 A. Yes, there would. Thank you.

11 Q. And the next line of my redirect goes to a question
12 from the Intervenor yesterday on the Grant County
13 ordinance. And, again, I'd like to walk you through some
14 facts just to make the record clear.

15 The first is for Crowned Ridge II, do you know the
16 number of turbines that are located in Grant County?

17 A. That would be two.

18 Q. And the location of those turbines, have they
19 changed from the time you did the studies for Grant
20 County to the studies that are included in the record in
21 this case?

22 A. No. They're in the same locations.

23 Q. Okay. So is it fair to say your results for the
24 Grant County ordinance that is no longer in effect but
25 those studies were done under would be the same today as

1 they were then?

2 A. They would be the same but actually lower because in
3 the original Grant County study at that point we had not
4 included LNTE blades. And in the current scenario we
5 have. So the results today would actually be lower.

6 Q. Is it also fair to say that in this record you have
7 produced studies that consider the new Grant County
8 ordinance as the threshold?

9 A. Yes. That is correct.

10 Q. So under either the old or the new, your studies
11 show that Crowned Ridge Wind II is in compliance?

12 A. That is correct.

13 MR. MURPHY: Thank you. That's all the redirect
14 I have.

15 MS. CREMER: Thank you.

16 Mr. Swanson.

17 MR. SWANSON: Thank you. Just a question or
18 two.

19 RE CROSS-EXAMINATION

20 BY MR. SWANSON:

21 Q. Mr. Haley, you were asked by one of the
22 Commissioners as to the greenhouse receptor that you
23 employed in your study?

24 A. Yes.

25 Q. So that's omnidirectional, I gather?

1 A. That is correct.

2 Q. Assume with me that there is a shadow flicker coming
3 from a turbine located to the east of a house and they
4 have no windows on that east wall but they have windows
5 on the west of the house, along with buildings and
6 structures and trees or open areas which would also be
7 receiving shadow flicker.

8 Is there a reflective effect at all from those other
9 items that are arrayed to the west of the house that
10 receive and reflect back shadow flicker into the windows
11 of the home that are on the west wall of the house?

12 A. The greenhouse receptor basically will accept or
13 record shadow from all directions all the time with no
14 blockage from anything. There is no reflection of
15 shadow. That's not a thing.

16 Q. All right. So you're telling me that if people are
17 in the house and they're looking out to the west to see
18 the shadow flicker arrayed over these other structures,
19 whether it's trees or grass or other buildings, they're
20 not going to notice or be annoyed by that shadow
21 flicker?

22 A. Shadow flicker occurs inside a building, in a room.
23 So if there's no window into that room where the shadow
24 flicker can get into the room, then there will be no
25 shadow flicker.

1 Q. Would you agree with me there is a divergence of
2 opinion as to what shadow flicker means, that it could
3 include shadow which is falling on exterior components of
4 a house or outdoor structures or greenways or anything
5 else?

6 A. No, I would not.

7 Q. All right. So shadow flicker doesn't exist as to
8 cars that are driving down the interstate under your
9 definition?

10 A. That has nothing to do with a wind farm.

11 Q. Well, what if the wind farm is close enough so that
12 it's emitting shadow flicker onto an interstate and there
13 is traffic on the interstate?

14 Are you saying the cars are not subject to shadow
15 flicker because it's not inside a house?

16 A. Yeah. That's what I'm saying.

17 Q. That's for your -- is there a divergency of opinion
18 on that of professionals in your line of work?

19 A. No. Not that I'm aware of.

20 Q. So everybody agrees that shadow flicker is a problem
21 only when it's occurring inside a house?

22 A. More or less, yeah.

23 Q. Okay. By studying the shadow flicker maps is it
24 possible to determine whether the house that you have
25 studied by way of this greenhouse receptor is receiving

1 shadow flicker from one, two, or more wind turbines?

2 A. Yeah. The model will add up the cumulative shadow
3 that is contributed from every turbine that it's
4 receiving --

5 Q. Excuse me. So all of that is factored into the
6 30-hour tally?

7 A. That is correct.

8 Q. Or whatever the estimate is.

9 Based on your knowledge of the project and the work
10 that you've done, is it common for the homes that you
11 studied, if you know, to receive shadow flicker from only
12 one turbine in one direction as opposed to multiple
13 turbines in a variety of locations or directions?

14 A. Any combination is possible. So anything from one
15 to you could have contributions from four or five.

16 Q. The maps should tell us if we study them with some
17 care, I assume?

18 A. Yeah. If you can decipher how the ISO lines work,
19 you can tell which turbines are contributing. And we can
20 also generate tables that show that.

21 Q. Say that again. You can generate a table which
22 shows --

23 A. Which shows the individual contributions from each
24 turbine.

25 Q. All right. So that's not part of your evidence in

1 this case, though, is it?

2 A. No. But we present the total.

3 Q. Who has that record?

4 A. I'm not sure what you're -- what do you mean by
5 that?

6 Q. Well, you said -- oh, you present the total, but you
7 don't break it down on a turbine-by-turbine contribution
8 basis?

9 A. Not for reporting for Application purposes. Because
10 there we're concerned about compliance. But for the
11 purposes of making decisions on what to do about moving
12 turbines to minimize shadow, I provide that to my clients
13 so that we can make decisions.

14 Q. All right. So has that work already been performed?

15 A. Oh, yeah. I mean, the turbines are set based on all
16 of those considerations.

17 Q. All right. So that's detailed information on a
18 turbine-by-turbine to receptor-by-receptor basis. That
19 information's already in the hands of Crowned Ridge is
20 your testimony?

21 A. Used for design purposes, yes.

22 Q. In response to Chairman Hanson, I believe, he asked
23 you about snow cover as a reflective or an absorbant type
24 of factor. And I believe you indicated that snow
25 generally was a very grabbing kind of ground cover?

1 A. Yes.

2 Q. Or absorbing, let's call it?

3 A. Yeah.

4 Q. What about ice?

5 A. Ice would be reflective.

6 Q. Would snow that has an ice type cover on it be
7 reflective as well, as well as ice?

8 A. Well, there again, it would be some combination of
9 absorption and reflection.

10 Q. All right. So ice would call then for a factor of
11 zero, I gather?

12 A. If it were solid ice everywhere, then you would
13 probably call it a zero.

14 Q. All right. And, again, using that formula is
15 important only with respect to the sound waves which
16 would be reflecting off the ground. Am I correct?

17 A. Not really.

18 Q. Not really what?

19 A. There is a reflection and there's absorption and
20 there's some combination in between.

21 Q. All right. But there are sound waves when you're
22 dealing with emissions from an 80 or 90 meter hub height.
23 There are sound emissions which travel directly from the
24 source to the receptor without being involved in
25 attenuation or being reflected or absorbed on the ground.

1 Do you agree with that?

2 A. Yes, I do. But the 9613-2 model is not a
3 physics-based model, which we talked about yesterday.
4 It's an empirically derived model. And we're not using
5 exact physical equations to describe what happens in
6 nature.

7 There are empirically derived factors such as the
8 ground absorption attenuation factor that has been proven
9 through trial and error basically to be the right factor.
10 We don't know exactly what physical formulas make that
11 up, but it doesn't matter if the net result of combining
12 those gives you the right answer.

13 MR. SWANSON: All right. Thank you.

14 MS. CREMER: Thank you.

15 Ms. Christenson.

16 MS. CHRISTENSON: Good morning. Thank you. And
17 thank you for clarifying the Dakota Range question.

18 RE CROSS-EXAMINATION

19 BY MS. CHRISTENSON:

20 Q. So yesterday when you said Dakota Range was included
21 and now you realize they weren't, I have some questions
22 regarding that.

23 Do you know off the top of your head how close the
24 closest Dakota Range turbine is in relation to the
25 Crowned Ridge Wind II study area?

1 A. Not off the top of my head, but it's way more than
2 five miles.

3 Q. Stop me if this is testifying, but I looked at the
4 Dakota Range map, and the project area comes down to
5 157th Street, and Crowned Ridge II starts at 163rd
6 Street. So that would be -- since we do miles, that
7 would be six miles from project area to project area, is
8 my understanding.

9 Do you agree with that? My math? Six?

10 A. I don't know. I would have to go and measure the
11 distance between the closest turbine and the closest
12 receptor because that's what would count for my
13 calculations.

14 Q. I see.

15 You model two kilometers outside the project area.
16 Am I correct?

17 A. We encompass -- we include in the model any occupied
18 structure that is within two kilometers of a wind
19 turbine.

20 Q. Within a wind turbine. So not even to the edge of
21 the project area if there's no receptor?

22 A. Within two kilometers of a wind turbine. We
23 actually build a buffer, and if the receptors fall within
24 that two kilometer buffer, we include it in the
25 calculations.

1 Q. Okay. Well, when I looked at a map, and I could be
2 wrong because I didn't use a scale ruler and there's no
3 real way to tell other than like what Tyler did
4 yesterday, just kind of hold your finger up there, I
5 thought it was probably 4 and a half miles to a Dakota
6 Range turbine from the project area that is called
7 Crowned Ridge Wind II. And I'm going to say it, but then
8 we'll qualify it. Okay.

9 In your testimony in Docket 19-003 you included some
10 remnants of Dakota Range turbines 20 to 25 miles away.
11 And yesterday you clarified that that's probably more --
12 you think, remnants would be 3 miles; is that correct?

13 A. What do you mean by remnants?

14 Q. Sound remnants, you were talking, I believe.

15 A. The question or the issue was is it possible for a
16 wind turbine 25 miles away to have any acoustical
17 interaction with the receptors, and the answer is no.

18 If you're beyond three miles away, there's probably
19 no interaction. If you're at five miles, there's
20 definitely no interaction.

21 Q. Okay. So four miles there's possibly some
22 interaction that would be an accumulative effect between
23 projects. Would that be fair?

24 A. I would say no.

25 Q. So in your experience it would not be practical

1 to -- or good practice, I'll say, to include a project
2 four miles from affected receptors from another project?

3 A. I would say it's not necessary. I'm not going to
4 talk about good practice or bad practice because it's
5 really a judgment call. It's more a matter of if you
6 want to take a question like that off the table, then
7 just include them.

8 So that's why we included Deuel Harvest. Even
9 though we don't think -- or we know, I should say,
10 there's no acoustical interaction, we included them
11 anyway to take this doubt off the table.

12 Q. And how far is Deuel Harvest away?

13 A. I don't know exactly, but maybe five miles.

14 Q. So a little bit farther -- or right around the same
15 as Dakota Range?

16 A. I can't -- I'd have to look at a map. My brain
17 doesn't work that way.

18 Q. I'm with you. Okay.

19 You talked about the greenhouse sensor a little
20 earlier being so much more conservative and that's why
21 you use that?

22 A. Yes.

23 Q. Okay. Why do you not use the most conservative
24 sensor for sound?

25 A. What would that be?

1 Q. I believe you said zero.

2 A. Oh, you're talking about the ground attenuation
3 factor?

4 Q. Yes.

5 A. Because if we used that factor, it would be so
6 unrealistic as to basically make the wind farm not
7 feasible, more than likely. Your turbine spacing would
8 be so unrealistically far apart that it wouldn't be
9 feasible to build the wind farm. And it would be
10 unnecessary.

11 It's the same reason they don't design buildings to
12 withstand the worst possible winds that you'd ever see.
13 Because if you did, you couldn't afford to buy the
14 structure.

15 Q. Okay. Thank you.

16 And Mr. Hanson talked to you about the range you
17 said of 30 to 40 dBA in a rural setting. Am I correct
18 saying 6 dBA is a doubling of perception of sound?

19 A. I don't remember those rules of thumb off the top of
20 my head, but I can say that it takes about a 3 decibel
21 difference before you can tell the difference.

22 Q. Okay. So 10 dBA -- 10 dBA, it's not just
23 subtracting 30 from 40 and saying, oh, there's 10 dBA?
24 There's actually an exponentially increasing --

25 A. Yeah. Decibels are added on a logarithmic scale.

1 So 40 decibels plus 40 decibels does not equal 80. It
2 equals 43.

3 Q. Okay. Thank you. That's helpful.

4 Where does your knowledge of the snow absorption --
5 of sound by snow, where does your knowledge of snow
6 absorbing sound come from?

7 A. Two sources. One is the literature, and the other
8 is personal experience.

9 Q. Freshly fallen snow, that would be the most
10 absorptive?

11 A. Yes. In my opinion.

12 Q. You talked about the ice being reflective of sound.
13 It would -- it would be a higher sound profile?

14 A. Yes.

15 Q. So looking at the map on the wall, all of those
16 lakes to the east, should those receptors and those
17 turbines maybe have a different sound attenuation factor?

18 A. No. Because they're not in between the turbines and
19 the receptors.

20 Q. Thank you.

21 Then I want to talk about your scientific study with
22 your stick and the moon. How high was your stick in the
23 air?

24 A. It doesn't really matter how high it was. It's just
25 a matter of getting it out in front of you. Because it's

1 the distance from the sun of that stick that counts.
2 Whether I have it this high or that high, it's such a
3 minute percentage of a distance from the moon it makes no
4 difference.

5 Q. The reason I ask that is because I picture -- I
6 picture my home. My home has a lot of large windows.
7 It's got a cathedral ceiling with those great big
8 trapezoid windows, and I get this beautiful moon view.

9 And I'm thinking if there was a turbine between me
10 and that moon, that has to come through my windows.

11 A. I can't dispute that. Yes. If there was a direct
12 line of sight between your eye and your house and the
13 turbine and the moon and they were all coincident on that
14 same line, yeah, you would definitely see the turbine
15 interrupting or in the moonscape.

16 But is that going to cause flickering in your room?
17 No.

18 Q. Okay. And when you -- when you do your flicker
19 study is that the one meter by one meter window? No.
20 That's the sound. That's not flicker.

21 A. We do two things. When we generate the maps, so you
22 get the ISO lines, what I use is a 10-meter-by-10-meter
23 square resolution. When you're generating the tables
24 you're calculating -- for shadow you're calculating every
25 minute of every day for the year. So that's the time

1 step.

2 Q. Okay. Thanks.

3 Going back to the Grant County ordinance and the
4 receptors that I had brought up that there were only four
5 listed on the PUC study, I believe, and correct me if I'm
6 wrong, Dakota Range was included in that sound study for
7 your Grant County Conditional Use Permit.

8 A. I don't recall. I'd have to look it up in the
9 report because if it was, I would have mentioned it
10 there. I'm not exactly sure exactly at what time we made
11 the decision to start including Dakota Range. It may
12 have been before or after that. But it would be easy to
13 verify by just looking at the executive summary of the
14 report.

15 Q. And Mr. Murphy talked about how you had changed and
16 you were going with the -- I'm not sure exactly how he
17 put this so he may have to interject here. You're going
18 with the new ordinance basically on this sound study that
19 you prepared for the PUC hearing?

20 A. Yeah. The current -- the current studies supporting
21 this Application are based on the new ordinance, which is
22 the 45 decibels and no accessory structures.

23 Q. Okay. So I'm not going to beat the dead horse about
24 that you're using the wrong ordinance again today. But I
25 will say that there are more homes in Grant County than

1 four. I don't think anybody will dispute me on that.

2 So how are we supposed to get an apples-to-apples
3 comparison of the sound and flicker if we don't include
4 the information from your past study to this study?

5 A. I guess, coming up with an apples-to-apples
6 comparison between the two studies has never been a task
7 I've been assigned. It's never been a question that's
8 come up until today.

9 The reason that there are only four occupied
10 structures in Grant County that are included in this
11 Crowned Ridge II study is based on the fact that there
12 are only two of them that are within 2 kilometers of a
13 wind turbine. And the other two are the Intervenor's that
14 are way, way beyond the 2 kilometers. So that's why
15 there's four.

16 Q. Are you aware of any changes in the -- well, let me
17 preface with this: When you applied for your permits in
18 Codrington County and in Grant County for your conditional
19 use permits -- and by "you" I'm talking about Crowned
20 Ridge. I know that you are their consultant, but they
21 were applied as one permit for Crowned Ridge I and
22 Crowned Ridge II combined in each county.

23 So Crowned Ridge I is included in all of your
24 studies in the county, Crowned Ridge I and Crowned
25 Ridge II combined. Since that time that we received the

1 Conditional Use Permit, Crowned Ridge I portion of that
2 permit, the county permits has been built, are you aware
3 of any changes that occurred in Crowned Ridge I since
4 there was a permit given in Grant or Codington Counties?

5 MR. MURPHY: Objection. It goes beyond the
6 scope of my redirect.

7 MS. CREMER: I would sustain.

8 MS. CHRISTENSON: That's all I have. Thank you.

9 MS. CREMER: Mr. Robish.

10 MR. ROBISH: Yes. Al Robish.

11 RECROSS-EXAMINATION

12 BY MR. ROBISH:

13 Q. Isn't my home one of the receptors in your study?

14 A. Yes, it is.

15 Q. What about my neighbors that are right around me
16 that are a half a mile away and a mile away? What about
17 their sound?

18 A. I don't know. I'd have to look at the maps to know
19 what you're talking about.

20 Q. There's probably 10 of them within two miles of my
21 house that should be affected by sound studies in
22 Grant County by Strandburg?

23 MR. MURPHY: Objection. Foundation, as well as
24 testifying. He needs to lay a foundation if he wants the
25 witness to understand the neighbors he's talking about.

1 MS. CREMER: Do you understand?

2 MR. ROBISH: No.

3 MS. CREMER: So you might have a visual image of
4 what you're talking about in your head.

5 MR. ROBISH: Okay.

6 MS. CREMER: But none of the rest of us do. So
7 we don't know who the neighbors are, how far they are.

8 MR. ROBISH: Could I give the names?

9 MS. CREMER: Well, I don't know if he would be
10 able to associate a name to a --

11 MR. ROBISH: Okay.

12 Q. Well, does it help from my location, the neighbor to
13 the north is half a mile away, a neighbor to the west is
14 three-quarters of a mile away, and a mile away?

15 Does that help at all?

16 A. Not really. But what I can offer up is that the way
17 that we determine which houses to include in the study is
18 based on how far they are from the nearest wind turbine
19 in the project, in the Crowned Ridge II project. And in
20 this case -- and that distance is 2 kilometers from a
21 turbine.

22 So the neighbors you're talking about I'm assuming
23 are beyond that 2 kilometer limit, which is why they
24 aren't included. But I would have to look at maps to
25 verify that.

1 Q. Probably the one to the north would be to the
2 west -- they should be running parallel with that
3 turbine, Evjen's turbine?

4 Yeah. And maybe Tim Novak Junior's. He's
5 probably -- he's the one with the autistic child, and
6 he's just east of that one within a mile and a half.
7 Those people need to be protected too.

8 MR. MURPHY: Objection. Same objection as
9 before. The foundation still hasn't been laid, and the
10 pro se Intervenor is testifying.

11 MS. CREMER: You are testifying. You just need
12 to -- you can lead him some to ask your question. And I
13 don't know if you want to show him a map and show him
14 where these people --

15 MR. ROBISH: I don't have one to show him right
16 now.

17 I probably don't have anymore questions then
18 so --

19 MS. CREMER: All right. Thank you.

20 Staff.

21 MS. EDWARDS: Thank you.

22 RECROSS-EXAMINATION

23 BY MS. EDWARDS:

24 Q. And picking up where Mr. Robish left off, can you
25 turn to Exhibit A14-1.

1 Actually I bet you don't need to have it in front of
2 you. You'll probably know off the top of your head.

3 That exhibit would be your sound study, I believe.
4 Is it accurate that that would include an ISO map?

5 (Mr. Murphy provides the witness with the document.)

6 A. Yes. That would include ISO maps, yes.

7 Q. So if you didn't -- even if you didn't have the
8 house as a receptor, by looking at one of those maps,
9 would you be able to get a rough idea of whether or not
10 houses in that area fell within the county noise level
11 standard?

12 A. Yes. Definitely.

13 MS. EDWARDS: Okay. And I can't pick it out
14 because I don't know where you live, Mr. Robish, but --

15 Q. Now I'm going to turn your attention back to what we
16 marked for identification purposes as S7. Can you turn
17 to Condition 26 on that, please.

18 A. Okay.

19 Q. And you talked a lot about attenuation factor with
20 the Commissioners in some follow-up questions. So with
21 what you know of Condition No. 26, would attenuation
22 factor come into play there, or would that be an actual
23 result? If you understand my question.

24 A. I'll read this first.

25 (Witness examines document.)

1 Q. So pursuant to that condition, if it were enforced
2 by the Commission, would it measure actuals, or would
3 there be an attenuation factor figured in?

4 A. I'm not sure that the attenuation factor is
5 applicable to the measurement process. My firm doesn't
6 conduct field measurements, but we do have another
7 witness that will be coming up after me that could
8 discuss that better than I can.

9 Q. Okay. And I'm going to hand you Exhibit S1. Can
10 you please turn to, in S1, DK_2. And then page 63 of
11 157. 68. I'm sorry.

12 A. Page 68?

13 Q. Yes. Of 157 in DK_2.

14 A. It's a map?

15 Q. And what does that map depict, if you know? You can
16 take a second to look at it.

17 A. What was your question?

18 Q. What does that map you're looking at depict?

19 A. This is a map indicating where the Intervenor's
20 structures are relative to the project.

21 Q. And does it include other wind projects in the area?

22 A. It includes Crowned Ridge I.

23 Q. Is yours in color? I'm sorry. I don't believe it
24 is.

25 A. No. It's black and white.

1 Q. Okay. So during his line of questioning -- during
2 Mr. Robish's line of questioning, if you're looking at
3 that map, was it your understanding he was referring as
4 to turbines from Crowned Ridge I or Crowned Ridge II?

5 A. He would definitely be talking about turbines in
6 Crowned Ridge I.

7 Q. Okay. Thank you.

8 How many people called the cops while you were
9 waiving a stick at the moon at an elementary school in
10 the night?

11 A. It was dark enough they couldn't see me.

12 MS. EDWARDS: No further questions.

13 MS. CREMER: Okay. I'm trying to catch where I
14 am here.

15 I believe a couple of the Commissioners had
16 further questions.

17 COMMISSIONER NELSON: I do have two.

18 You indicated that when you're doing your
19 studies and you're identifying what receptors to include
20 you went 2 kilometers outside was it the project boundary
21 or away from the closest turbine?

22 THE WITNESS: Away from the closest turbine.

23 COMMISSIONER NELSON: So earlier you testified
24 that it would be possible for sound to go up to 3 miles.
25 Why would you not use 3 miles instead of 2 kilometers?

1 THE WITNESS: Because of the attenuation of the
2 sound with distance. By the time you get out to that
3 distance, the sound level is low enough that its
4 contribution is essentially zero when you combine them
5 with a logarithmic scale.

6 COMMISSIONER NELSON: Okay. So I understand
7 that could be true at 3 miles. So is that also true at
8 2.1 kilometers?

9 THE WITNESS: There is a combination of things
10 going on. One is is that if the sound level at a
11 location is approximately 10 decibels lower than --

12 Put it this way: If the sound contribution from
13 one turbine is 10 decibels or more lower than the sound
14 contribution from the other, when you combine them you
15 won't get any adding of sound. You'll only have the
16 higher number. So that comes into play as you get
17 farther out.

18 So if you're reading 45 decibels from one
19 turbine and the other turbine is contributing 32, 32 plus
20 45 is going to equal 45.

21 COMMISSIONER NELSON: Okay. I understand that,
22 but that's not my question.

23 So let's assume for this questioning purpose
24 that you have a single turbine and you have a single
25 receptor that is 2.1 kilometers away from that turbine.

1 Is that receptor going to be -- going to be affected by
2 the noise from that single turbine?

3 THE WITNESS: Yes, it will. But it will be so
4 far below the thresholds that it's not important.

5 COMMISSIONER NELSON: Okay. So what I'm hearing
6 from you is as long as you're 2.1 kilometers away, you're
7 going to be below either the 50 or the 45 threshold?

8 THE WITNESS: Yes. Definitely. And the
9 cumulative effects are going to be negligible, and the
10 background noise will also mask.

11 COMMISSIONER NELSON: Thank you. I want to go
12 back to some of the questions that Mr. Swanson had. I'm
13 getting a clear picture.

14 There is a distinct difference between shadow
15 and shadow flicker; correct?

16 THE WITNESS: Yes, there is.

17 COMMISSIONER NELSON: And all of your studies
18 deal with shadow flicker only; correct?

19 THE WITNESS: That is correct.

20 COMMISSIONER NELSON: And so we've been putting
21 all of this focus on shadow flicker, and I understand
22 why.

23 Is it possible that shadow could be an
24 annoyance?

25 THE WITNESS: I guess I think that's subjective.

1 I suppose to some people it could be, and to others they
2 probably never thought about it.

3 COMMISSIONER NELSON: So if it's an annoyance to
4 some people, why are we not putting any focus at all on
5 shadow?

6 THE WITNESS: I really don't have an answer for
7 that.

8 COMMISSIONER NELSON: Well, I'll just tell you,
9 I mean, this is an interesting question to me because if
10 you've got an annoyance factor, it seems that there ought
11 to be some focus on it.

12 But in your practice that's never come up?

13 THE WITNESS: Never.

14 COMMISSIONER NELSON: Thank you.

15 MS. CREMER: Kristie, did you have a question or
16 Gary?

17 Oh, okay. So final redirect, Crowned Ridge.

18 MR. MURPHY: Nothing further. Thank you.

19 MS. CREMER: All right. Thank you, Mr. Haley.
20 You may step down.

21 (The witness is excused.)

22 MS. CREMER: And who is your next witness?

23 MR. SCHUMACHER: Crowned Ridge would call
24 Richard Lampeter.

25 (The oath is administered by the court reporter.)

DIRECT EXAMINATION

1
2 BY MR. SCHUMACHER:

3 Q. Please state your name, business title, and company
4 for the record.

5 A. Good morning. My name is Richard Lampeter. I'm
6 employed at Epsilon Associates located at Maynard,
7 Massachusetts. I'm an associate there, and I also manage
8 the acoustics group.

9 (Discussion off the record.)

10 A. Sorry. My name was Richard Lampeter. I'm an
11 associate at Epsilon Associates located in Maynard,
12 Massachusetts. I also manage the acoustics group there.

13 Q. What is your role with the Crowned Ridge Wind II
14 project?

15 A. My role has been to provide advice on sound-related
16 issues such as low frequency and infrasound and the
17 postconstruction sound protocol.

18 Q. Please provide a short overview of your education
19 and experience.

20 A. I have over 15 years of experience in conducting
21 impact assessments for various developments across the
22 United States, including approximately 90 wind energy
23 projects. Prior to joining Epsilon, I graduated from
24 Lyndon State College in Vermont with a Bachelor's of
25 Science in environmental science.

1 Q. Did you file Prefiled Direct Testimony and exhibits
2 on July 9, 2019, that are marked as A7 and A7-1 through
3 A7-3 and Prefiled Rebuttal Testimony on January 8, 2020,
4 that is marked as A23?

5 A. Yes.

6 Q. Do you have any changes or corrections to your
7 prefiled testimony and exhibits?

8 A. No, I do not.

9 Q. Please provide a short overview of your prefiled
10 testimony.

11 A. Thank you.

12 The primary purpose of my testimony is to support
13 the adoption of a postconstruction sound protocol. As
14 explained in my Rebuttal Testimony, Staff witness
15 Mr. Hessler and I are in agreement on the protocol for
16 use at Crowned Ridge Wind II, and that protocol has been
17 set forth in the to-be-submitted stipulated conditions.

18 MR. SCHUMACHER: No further questions for this
19 witness and would pass for cross-examination.

20 MS. CREMER: Thank you.

21 Mr. Swanson.

22 CROSS-EXAMINATION

23 BY MR. SWANSON:

24 Q. Mr. Lampeter, you have sponsored Exhibit RL3, which
25 is your -- I believe that is your article that you wrote

1 about LFN and infrasound from wind turbines?

2 A. That is correct. I was the co-author on that.

3 Q. All right. Now RL2 is a little bit different. In
4 RL2, which is your proposed sound construction
5 protocol -- strike that.

6 I want to stay with RL3. At page 3 of Exhibit A7,
7 line 23, your research -- and I believe it was
8 independent research that you're describing. Am I
9 correct on that?

10 A. That is correct.

11 Q. It wasn't simply --

12 A. It was -- it was for NextEra Energy Resources, but
13 it was independent and peer reviewed and published.

14 Q. All right. And you did field research on this. Am
15 I correct?

16 A. Yes. That is correct.

17 Q. All right. You found that there was no audible
18 infrasound at 1,000 feet from a turbine. Am I correct?

19 A. Correct.

20 Q. Is there also an inaudible component to infrasound?

21 A. Well, the definition of infrasound is sound levels
22 below the frequency of 20 hertz. And typically that is
23 defined as the inaudible region.

24 The audibility threshold does extend beyond 20
25 hertz. So if the sound level is high enough in those low

1 frequencies in that infrasound region, it can be
2 audible.

3 Q. All right. So you didn't find audible infrasound at
4 1,000 feet. Were you able to determine whether there was
5 a preference of other kinds of infrasound?

6 A. We did measure sound levels below 20 hertz.

7 Q. All right. And so that would be inaudible?

8 A. Correct. That's in the inaudible range.

9 Q. All right. Did you do any measurement as to how far
10 from a wind turbine audible components would have
11 reached?

12 A. We did not determine how far out. The question was
13 to determine at 1,000 feet is the sound level in those
14 frequencies audible and, therefore, cross a particular
15 threshold.

16 Q. All right. Was there inaudible infrasound at
17 1,000 feet from the turbine?

18 A. Yes. That is correct.

19 Q. Did you establish whether it was present at any
20 greater distance from a wind turbine?

21 A. Yes. We did measure at distances further away.

22 Q. And what was the maximum distance you would have
23 measured?

24 A. I believe it was 1,500 to 2000 feet, but I'd have to
25 look back at that. That's not one of the key conclusions

1 or the purpose of the study.

2 Q. And you're not mentioning that in your exhibits, are
3 you?

4 A. No, I did not.

5 Q. Do you have any information as to how far infrasound
6 of an inaudible nature might extend from a wind turbine?

7 A. I do not know how far out.

8 Q. All right. That's a distance you've never plumbed
9 or researched?

10 A. No. I've seen in the research where there's been
11 measurements greater distances than that, but, again, the
12 focus has been to evaluate a criteria, and the concern is
13 when is the criteria exceeded and what's that closest
14 distance.

15 If you find an acoustical signature or a sound level
16 at a greater distance, it's not necessarily relevant to
17 the evaluation you're trying to conduct in this case,
18 audibility.

19 Q. So audibility was what you were attempting to
20 determine.

21 A. With respect to infrasound, yes.

22 Q. All right. Is it possible that there would be a
23 subset or a portion of the population that would be
24 annoyed by inaudible components of infrasound?

25 A. There are other witnesses prepared to testify that

1 are going to talk about health effects, and I would
2 prefer to defer those questions to them.

3 Q. All right. And who would that include?

4 A. That would be Dr. Ollson and Dr. McCunney.

5 Q. All right. At page 3 of your Exhibit A7 you also
6 mention that the environment is -- has other aspects of
7 low frequency sound, and you mention refrigerators and,
8 among other things, ocean waves. Am I correct?

9 A. That is correct.

10 Q. Isolating now on a rural residence within or near
11 the boundaries of this proposed wind farm, would you
12 agree with me that the wind farm itself is going to be
13 the overwhelming presence or emitter of low frequency
14 sound?

15 A. No, I would not.

16 Q. Okay. What other low frequency sound would exist
17 there?

18 A. Well, as stated, in the interior of one's home there
19 are a variety of mechanical devices that will create
20 infrasound in low frequency, such as refrigerators, an
21 air conditioner.

22 In a natural environment you've seen and the data
23 has shown that wind noise through various environments
24 will create low frequency noise. Thunder infrasound in
25 low frequency noise as well. So there are other sources.

1 Q. So usually if someone's bothered by a noise, in my
2 experience, and it's within their home, they probably set
3 about to either fixing it or getting used to it.

4 Would that be a safe assumption?

5 A. Can you state that again?

6 Q. Well, if someone is bothered by infrasound coming
7 from an air conditioner or something of that sort inside
8 their home, they would either get used to it or fix it.

9 A. Since infrasound would be inaudible, I don't know of
10 a case where someone has expressed a case that the
11 infrasound was bothering them from a particular item.

12 Q. All right. So you're talking about inaudible
13 infrasound when you mention this?

14 A. Correct.

15 Q. All right. I thought we were talking about audible
16 infrasound as comes from -- I can hear a refrigerator,
17 for example, or an air conditioner. I don't often hear
18 ocean waves, but if we're inside a home that's in the
19 boundaries or near the boundaries of the wind farm, are
20 you testifying that the wind farm itself would not be the
21 major source of low frequency noise and infrasound
22 experienced in that home?

23 A. There's a difference between what is measurable and
24 what is audible and experienced. So as with any sound
25 source, there's a variety of frequencies that make up the

1 sound from that particular device or in that environment.

2 So there is low frequency and infrasound from things
3 such as air conditioners, refrigerators, washing machines
4 inside a home. At the infrasound region those levels
5 would be less than the audibility threshold but still
6 potentially greater -- will be greater than the
7 infrasound in specific frequencies perhaps from wind
8 turbines.

9 Q. One of my clients is Mr. Greber, Mary and Steven
10 Greber. And I believe their home is predicted for a
11 44.5 decibel. Their receptor is CR2-D221-NP.

12 In listening to the testimony of Mr. Haley this
13 morning, if we were to compare 40 dBA with 44.5 dBA, that
14 difference on a percentage basis would be somewhat more
15 than 200 percent, would it not?

16 A. Comparing 44 to 40?

17 Q. 44.5 to 40.

18 A. From a perception basis it would fall into the
19 category of perceptible. So there's -- as Mr. Haley was
20 indicating in his testimony, there is 0 to 3 decibels is
21 roughly the range of perceptibility. And this goes back
22 to the other question. Then there's noticeable at 6
23 decibels. And then twice as loud, 10 decibels.

24 Percentagewise, it depends what you're talking about
25 because it's logarithmic in nature. Are we talking about

1 the sound pressure, the sound pressure level? There's
2 different ways to look at it. The clearest way to so
3 look at what's perceptible and sort of the doubling of
4 loudness perhaps and that's the 3, 6, and 10 ways to
5 compare that difference between sound levels.

6 Q. All right. So to go back to my question then,
7 between 40 dBA and 44.5 dBA it's certainly a perceptible
8 difference?

9 A. Yes. That is correct.

10 Q. But it's not a doubling of sound?

11 A. Correct. It's not twice as loud.

12 Q. Somewhere short of twice.

13 A. Well, it does not sound twice as loud. If you have
14 two sound sources and you -- whatever the numbers are, we
15 could say one sound source is 40 and the other sound
16 source is 40, you're doubling the sound. That only
17 results in a 3 decibel increase in the level due to the
18 logarithmic nature of combining sounds and sound sources.

19 Q. Okay. Now I understand that you are involved in the
20 design of the postconstruction sound protocol. Am I
21 correct?

22 A. That is correct.

23 Q. So the objective, as I understand it, is to
24 determine what the sound emission is but exclusive of all
25 unrelated background noise. Am I correct on that?

1 A. That is correct.

2 Q. Have you determined what the current level of
3 background noise is in this area exclusive of the wind
4 farm activity?

5 A. For a proper evaluation of the sound level due to
6 the project you would want to collect those background
7 measurements close in time to the operational
8 measurements and allow a subtraction as outlined in the
9 condition.

10 Q. So this is something that's coming up that you will
11 be undertaking, as I understand it?

12 A. If it becomes a condition and then is requested and
13 required by the Commissioners, then that process would go
14 forth to do both an operational and then a series -- I
15 believe it's 10, minimum of 10, shutdowns during the
16 program to establish background at that time. Because
17 background will vary.

18 And using data from a year, two years, or general
19 numbers for this type of environment creates more
20 certainty in trying to establish what the operational
21 sound level is.

22 Q. Were you here for Mr. Haley's testimony?

23 A. Yes, I was.

24 Q. And I believe Chairman Hanson had asked a question
25 of an estimate of what the current background noise was

1 now in this rural area? Did you hear that testimony?

2 A. Yes, I did.

3 Q. And I think the response was somewhere in the 30 to
4 35 dBA? Am I correct on that?

5 A. I believe it was 30 to 40 was the response given.

6 Q. Well, there was a separate answer I think that said
7 30 to 35.

8 A. Perhaps. I don't remember that piece of it.

9 Q. All right. And you've done no measurement of the
10 background noise at this stage.

11 A. We have taken measurements in South Dakota in the
12 project area. Yes, I have.

13 Q. Okay. You've done those measurements?

14 A. I have supervised them. I have not personally been
15 in the field.

16 Q. Was it your company that did it?

17 A. Yes. It was us.

18 Q. And do you have access to those studies or that
19 report?

20 A. It was not a formal study completed and submitted.

21 Q. Do you have knowledge of what the results were?

22 A. Yes, I do. I have knowledge of the measurements.

23 Q. All right. What is your knowledge?

24 A. I would say that the range would be broader for the
25 ambient sound levels, and that range being approximately

1 20 to 60.

2 Q. 20 to 60 dBA?

3 A. Yes.

4 Q. It depends on whether you're close to a highway or
5 not, for example?

6 A. It depends how close you are to an interstate, local
7 traffic, wind conditions, local sources.

8 Q. Do you have access to a chart or a plotted map or
9 anything of that sort that would show those readings?

10 A. Not right here.

11 Q. But you have prepared such a document?

12 A. I've put together a draft summary.

13 Q. Okay. Of the range that you've talked about, 20 to
14 60, does it predominate in the lower range of readings
15 that you've reported on? In other words, are there more
16 readings in the 20 to 30 range than there are in the
17 30 to 40 range?

18 A. It's been a while since I've looked at the data. I
19 would say that it's probably -- probably fairly evenly
20 spaced out, but it depends on what the winds were at that
21 given time.

22 So if it was a windier period, the sound levels
23 would be higher than if it was a lighter wind period.
24 And these environments often the wind can be a primary
25 driver of the sound levels, and rustling vegetation

1 associated with that.

2 Q. If it's a still night, would it tend to be in the
3 lower range of the reading range that you talked about,
4 in the 20 dBA?

5 A. It can be. But if there are insects, that can often
6 push up the sound level. So summertime period, even
7 though it's calm out, you have other sources of sound.

8 Q. Did you take readings on the Fourth of July?

9 A. No. I don't believe we did.

10 Q. All right.

11 MR. SWANSON: Thank you. That's all I have for
12 this witness.

13 MS. CREMER: Thank you.

14 Ms. Christenson, do you know, will yours be
15 long?

16 MS. CHRISTENSON: Why would you say that?

17 MS. CREMER: It's a mystery.

18 MS. CHRISTENSON: No.

19 MS. CREMER: No. All right. Then why don't you
20 go ahead and proceed.

21 CROSS-EXAMINATION

22 BY MS. CHRISTENSON:

23 Q. You're grateful it's not going to be long; right?

24 A. I'm happy to answer as many questions as you have.

25 Q. Mr. Lampeter; is that right?

1 A. Correct.

2 Q. Did Crowned Ridge Wind II ask you to perform a
3 preconstruction sound modeling study?

4 A. Yes. That study was conducted, and they requested
5 it.

6 Q. And that's the study that you were talking about
7 that's not been published or submitted?

8 A. That's correct. We went and collected the data and
9 put together some draft summary findings, and that's
10 where it currently stands.

11 Q. Thank you.

12 Did Crowned Ridge Wind II ask you to perform any
13 studies or modeling regarding low frequency noise or
14 infrasound?

15 A. No.

16 Q. According to your resume, you have experience in air
17 quality modeling. Did Crowned Ridge Wind II ask you to
18 perform any air quality study or model for this project?

19 A. No.

20 Q. Were any of the readings that you've taken in the
21 Crowned Ridge Wind II project in this study that we
22 talked about a little bit ago taken after a freshly
23 fallen snow?

24 A. No.

25 MS. CHRISTENSON: That's all I have.

1 MS. CREMER: Thank you.

2 Mr. Robish.

3 MR. ROBISH: I have none. Thank you.

4 MS. CREMER: Thank you.

5 Staff.

6 CROSS-EXAMINATION

7 BY MS. EDWARDS:

8 Q. Thank you. Are you familiar with the compliance
9 testing protocol?

10 A. Yes.

11 Q. Are there times of the year or temperatures below
12 which testing could become difficult or impossible?

13 A. Yes.

14 Q. Can you explain that?

15 A. Under very cold temperatures the equipment becomes
16 less reliable in the sense that the LCD screens become
17 difficult to operate and use. It just doesn't respond to
18 working through the menus and setting things up so that's
19 a limitation.

20 There is also -- with the equipment itself, some of
21 it's metal. Some of it's plastic. So trying to combine
22 and put together the equipment and do accurate
23 calibrations becomes very difficult. Working with
24 computers to download the instrumentation becomes a
25 challenge.

1 So very cold weather or periods you would want to
2 avoid. Also for safety of the individuals in the
3 field.

4 MS. EDWARDS: Sure. Thank you. No further
5 questions.

6 MS. CREMER: Thank you.

7 So we're at Commission questions. We're also
8 bumping up against 10:00.

9 (Discussion off the record.)

10 CHAIRMAN HANSON: I only have a few, but his
11 answers are going to be real long. I'll see how quickly
12 I can get through mine.

13 Good morning, Mr. Lampeter.

14 THE WITNESS: Good morning.

15 CHAIRMAN HANSON: Welcome to South Dakota.

16 THE WITNESS: Thank you.

17 CHAIRMAN HANSON: You coauthored a study. And
18 can you tell us on -- it's Exhibit RL3. Can you tell us,
19 is that supported by other similar studies, your
20 conclusions? Are they supported by other studies?

21 THE WITNESS: I would say it's somewhat unique
22 and not completely duplicative in the fact that the study
23 measured sound levels which has been done and those sound
24 levels have been used in different ways for other studies
25 but this one looks specifically at ANSI standards.

1 So I haven't seen another study that's done
2 exactly what's been done here. The sort of -- the
3 conclusion that the low frequency sound and infrasound is
4 not of concern is supported in other ways through other
5 studies.

6 So this particular study looks at it from the
7 perspective of audibility for infrasound and ANSI
8 standards and a couple of European and there's a couple
9 Japanese guidelines that focus on infrasound and low
10 frequency. We went at it from that perspective.

11 There are other studies that come at it from a
12 different perspective, some epidemiological studies which
13 come to conclusions that low frequency noise and
14 infrasound is not a concern for wind turbines.

15 CHAIRMAN HANSON: See, I knew your answers would
16 be longer than my questions.

17 Tell me then, similar is a fairly general term.
18 If we're looking at it from the standpoint of somewhat of
19 the similarities, are there studies that controvert what
20 your studies show?

21 THE WITNESS: No.

22 COMMISSIONER NELSON: You're learning.

23 CHAIRMAN HANSON: Have you ever studied in
24 relationship to sound and the effect on sleep
25 deprivation?

1 THE WITNESS: I haven't personally done a study
2 on that. I'm familiar with the studies that have been
3 published, but that hasn't been a focus of my independent
4 work.

5 CHAIRMAN HANSON: Okay. Have you ever testified
6 on behalf of Intervenor in a wind docket?

7 THE WITNESS: No, I have not.

8 CHAIRMAN HANSON: In your testimony on page 2,
9 Supplemental Testimony, you state that there's an
10 uncertainty factor of 2 decibels for all wind turbines.

11 All of the information that you put here shows a
12 pretty conservative approach to the work that you did
13 from the standpoint of assuring that the -- when I say
14 conservative, the most -- I guess it would push it in the
15 favor of making certain that there is the least amount of
16 effect on -- of sound on receptors. Is that correct?

17 THE WITNESS: The model -- I'm assuming this
18 relates to the modeling parameters.

19 CHAIRMAN HANSON: Correct.

20 THE WITNESS: So the modeling parameters that
21 have been used here by Mr. Haley are comparable to the
22 parameters we would include in a sound level model, and
23 they are conservative in that under a variety of
24 conditions the sound levels measured would be at or below
25 the model levels.

1 CHAIRMAN HANSON: On that same testimony you
2 state that there was used an uncertainty factor of
3 2 decibels for all wind turbines. Is that a plus or
4 minus 2 decibels?

5 THE WITNESS: The manufacturer typically gives a
6 range of plus or minus 2. In the model the way we have
7 accounted for that in our studies and what's been done
8 here by Mr. Haley is to add 2 to the sound power level
9 provided by the manufacturer so that makes the sound from
10 the wind turbines higher; therefore, the modeled number
11 at the homes higher as well. And that's the --

12 CHAIRMAN HANSON: Thank you for answering my
13 follow-up question with your answer just now.

14 THE WITNESS: You're welcome.

15 COMMISSIONER FIEGEN: I guess I do have one.

16 The study that you did, the coauthored study,
17 did you say that NextEra funded that study?

18 THE WITNESS: That is correct.

19 COMMISSIONER FIEGEN: So you have done research
20 and have had studies from other organizations more than
21 NextEra?

22 THE WITNESS: That's the only one that I've been
23 a part of that's been in a peer-reviewed journal article.

24 COMMISSIONER FIEGEN: Okay. So since you're a
25 researcher and I'm not and I watch media a lot, of

1 course, so what would happen if you were hired by NextEra
2 or whoever and it wasn't the outcome that the person that
3 paid for the study would want?

4 Would it still be published and peer reviewed?

5 THE WITNESS: I don't know the -- in that
6 hypothetical case, I don't know what necessarily would
7 happen. I know that NextEra, though, did not influence
8 us. They were -- we set up the boundaries of the study.

9 COMMISSIONER FIEGEN: Sure.

10 THE WITNESS: And that they were -- they've
11 seen -- at the time this was in 2011. The issue was
12 starting to come up, and they wanted to know the answer.

13 COMMISSIONER FIEGEN: Right.

14 THE WITNESS: So they wanted to know if it's a
15 real concern, how do we build projects that are not
16 creating a nuisance?

17 So they were interested in the findings, and I
18 would have expected if they did see that there were
19 findings, they would adjust how they develop projects.

20 COMMISSIONER FIEGEN: Okay. Thank you.

21 MS. CREMER: So normally we would go to your
22 redirect, but it is 10 o'clock so we will -- and we will
23 back to that. And let's break until 10:15.

24 (A short recess is taken.)

25 MS. CREMER: Crowned Ridge, did you have any

1 redirect for this witness?

2 MR. SCHUMACHER: We have no redirect. Thank
3 you.

4 MS. CREMER: All right. Thank you for your
5 testimony. You may step down.

6 THE WITNESS: Thank you.

7 (The witness is excused.)

8 MS. CREMER: And you may call your next witness.
9 And could you just for planning purposes tell us who the
10 next few are.

11 MR. MURPHY: We have three more witnesses:
12 Dr. McCunney who will go next, Dr. Ollson, and then
13 Sarah Sappington.

14 MS. CREMER: All right. Thank you.

15 MR. MURPHY: Call Dr. McCunney.

16 (The oath is administered by the court reporter.)

17 DIRECT EXAMINATION

18 BY MR. MURPHY:

19 Q. Please state your name, business title, and company
20 for the record.

21 A. My name is Dr. Robert J. McCunney. I'm a physician,
22 and I practice at the Brigham & Women's Hospital in
23 Boston.

24 Q. What is your role with Crowned Ridge Wind II?

25 A. I was asked as a consultant to review documents that

1 have been submitted in this case to address potential
2 health-related issues associated with the project.

3 Q. Please provide a short overview of your education
4 and experience.

5 A. I have a bachelor's degree in chemical engineering
6 from Drexel University, a master of science degree in
7 environmental health from the University of Minnesota. I
8 have a medical degree from Thomas Jefferson University in
9 Philadelphia. I trained in internal medicine at
10 Northwestern University Medical Center in Chicago, and I
11 did a fellowship in occupational and environmental
12 medicine at the Harvard School of Public Health.

13 Q. Did you prefile Supplemental Testimony and exhibits
14 on September 20, 2019, Exhibit A17 and Exhibits A17-1
15 through A17-8?

16 A. Yes.

17 Q. Do you have any changes or corrections to this
18 prefiled testimony or exhibits?

19 A. No.

20 Q. Please provide a short overview of your testimony.

21 A. Based upon my review of the documents and testimony
22 introduced in this case, including the sound and flicker
23 thresholds, Crowned Ridge Wind with which they must
24 comply, there are no health or welfare concerns
25 associated with the project as proposed by Crowned

1 Wind II.

2 Although reports suggest that some people living
3 near wind turbines may find the noise annoying, noise is
4 not an adverse health effect. It is not coded as a
5 specific diagnosis in the latest version of the
6 International Classification of Diseases, that is the
7 10th edition.

8 In fact, what's been shown through research is a
9 person's attitudes towards wind energy, potential
10 economic benefits, and visual aspects of the turbines
11 have actually been shown to be more important than noise
12 to determine why some people report annoyance with wind
13 farms.

14 Therefore, while some people may be annoyed with the
15 wind farm, Crowned Ridge Wind sound and shadow flicker
16 thresholds do not pose health or welfare issues for the
17 residences.

18 MR. MURPHY: Thank you.

19 I offer Dr. McCunney for cross-examination.

20 MS. CREMER: Thank you.

21 Mr. Swanson.

22 MR. SWANSON: I have no questions of this
23 witness.

24 MS. CREMER: Thank you.

25 Ms. Christenson.

CROSS-EXAMINATION

BY MS. CHRISTENSON:

Q. Good morning.

A. Good morning.

Q. In response to what you just said, noise is -- or annoyance is not a health effect? Is that what you said?

A. Yes. That's correct.

Q. But annoyance can possibly lead to some health effects?

A. Well, perhaps you could define some of those circumstances. Generally speaking, annoyance is not a health effect.

Q. So stress from annoyance, sleep deprivation could lead to a health effect? I guess that would be my question.

A. Well, certainly sleep deprivation can lead to adverse health effects, no question.

Q. Thank you.

Is there a code for vibroacoustic disease in the International Classification of Diseases?

A. There may be. I haven't looked at that recently.

Q. If I said T75.2, would that maybe ring a bell?

A. Perhaps, yes.

Q. Okay. Okay. How close is your home to the nearest wind turbine?

1 A. Well, I haven't measured it. I've recently moved.
2 Before I was about a mile away from a wind turbine, about
3 the distance you are from the nearest Crowned Ridge Wind
4 turbine.

5 Q. And how long did you live in your home a mile away
6 from a wind turbine?

7 A. About 20 years.

8 Q. And how many wind turbines were within a mile of
9 your home?

10 A. There was one particular wind turbine.

11 Q. And how tall was that wind turbine, if you know?

12 A. I can't recall, but I could certainly see it from my
13 porch.

14 Q. And you wouldn't happen to know the generator size?

15 A. No, I don't.

16 MS. CHRISTENSON: Okay. Those are all the
17 questions I have. Thank you so much.

18 THE WITNESS: Thank you.

19 MS. CREMER: Mr. Robish.

20 MR. ROBISH: I have none.

21 MS. CREMER: Thank you.

22 Staff.

23 MS. EDWARDS: No questions.

24 MS. CREMER: Chairman Hanson.

25 CHAIRMAN HANSON: Good morning.

1 THE WITNESS: Good morning, Mr. Hanson.

2 CHAIRMAN HANSON: Your presentation is very
3 complete. I appreciate the way that you put it together.
4 Your cross-sectional study that was carried out
5 in 2013, are you familiar with any studies post that
6 study?

7 THE WITNESS: I'm not sure. The cross-sectional
8 study? To which study are you referring?

9 CHAIRMAN HANSON: You referred to, This study is
10 attached to Exhibit RMS-2. It is a cross-sectional study
11 that was carried out in 2013 and includes 1,238 randomly
12 selected participants.

13 THE WITNESS: Oh, yes. That's the Health Canada
14 Study that included about 1,200 people. That's correct.
15 I believe it was initiated around 2013, but the
16 publications came out anywhere from 2016 to 2018.

17 CHAIRMAN HANSON: Are you familiar or aware of
18 any studies of similar type that have occurred since that
19 time?

20 THE WITNESS: No. And as part of the
21 preparation for this hearing, I did updated literature
22 searches to see whether any additional studies had been
23 published since the Health Canada reports were released,
24 and there have not been any.

25 CHAIRMAN HANSON: And you are apparently not

1 aware of any sleep deprivation, sleep disturbance, sleep
2 challenges as a result of wind turbines?

3 THE WITNESS: Certainly, the major study, the
4 Health Canada Study, it specifically addressed potential
5 sleep issues associated with wind turbine operations or
6 at least living within a certain distance of wind
7 turbines.

8 And what was appealing to me about the Health
9 Canada Study, not only is it the largest study that's
10 been published in the world's literature related to wind
11 turbines, but the investigators looked at both what we
12 call subjective and objective measures of sleep.
13 Subjective, of course, is what you report and objective,
14 of course, is what's measured.

15 And they used what they call wrist actigraphy,
16 which is a fancy way of looking at movements during sleep
17 and so forth. So there was both objective and subjective
18 information that Health Canada included in their analysis
19 and ultimately concluded that noise levels up to
20 46 decibels would not cause any sleep disturbance.

21 CHAIRMAN HANSON: As a physician, are you aware
22 of any studies regarding tinnitus in which sound levels
23 create greater problems or less challenges?

24 THE WITNESS: To be clear, we're talking about
25 tinnitus, the ringing in the ears?

1 CHAIRMAN HANSON: Correct.

2 THE WITNESS: Oh, okay. Certainly, tinnitus is
3 a troubling phenomenon for a lot of people in the medical
4 setting. Sometimes it happens de novo, as it were,
5 meaning for no particular reason. Other times it's very
6 high noise levels. By that I mean in industry like near
7 airplanes and railroads and so forth who are maybe up in
8 80s and 90s in certainly some manufacturing settings.

9 But the Health Canada Study indicated that there
10 was no increased risk of tinnitus in their analysis.

11 CHAIRMAN HANSON: What about volume that a
12 subject would hear as a result of -- if there's --
13 there's a ringing in the ears if there's -- oh, if you
14 went to a Nine Inch Nails concert, it's going to be
15 louder than if you went to listen to Bach, for instance.

16 THE WITNESS: Well, I prefer the Bach. But no
17 question. And some of the noise levels in those concerts
18 can really approach high levels that my colleagues could
19 be more familiar with the numbers. But it wouldn't
20 surprise me that when you get up in the 90s and 100s and
21 certainly when you're in environments with noise that
22 high for prolonged period of time, developing tinnitus
23 would not be an unsurprising reaction.

24 CHAIRMAN HANSON: And the infrasound level from
25 wind you're testifying is not going to affect tinnitus,

1 whether you can hear it or can't hear it?

2 THE WITNESS: No. There's no evidence in the
3 medical literature with which I'm familiar with that
4 would suggest that infrasound, whether audible or
5 inaudible, would cause tinnitus.

6 CHAIRMAN HANSON: Okay. Thank you.

7 THE WITNESS: Thank you.

8 COMMISSIONER NELSON: Good morning.

9 THE WITNESS: Good morning.

10 COMMISSIONER NELSON: In relation to shadow
11 flicker, if there are shadow flicker levels above
12 30 hours a year, is there a point where that can become
13 or cause health impacts?

14 THE WITNESS: Well, certainly, as we all know,
15 there's no debate. I mean, shadow flicker can be
16 annoying to some people.

17 COMMISSIONER NELSON: Yeah. So I want to set
18 the annoyance aside and ask specifically about health
19 impact.

20 THE WITNESS: Well, the one major health impact
21 that's been addressed and certainly raised as a concern
22 was whether the shadow flicker would increase the
23 propensity for someone to develop an epileptic seizure.
24 And, in my view, that particular risk has been well
25 addressed and found not to be a risk.

1 Now shadow flicker, in the absence of
2 precipitating photoleptic [phonetic] seizures certainly
3 can be annoying. Where that level ultimately comes into
4 play and were to cause health effects, I don't know, to
5 be candid.

6 I know we've been operating many years to keep
7 shadow flicker less than 30 hours a year. I don't know
8 what the number might be where it would get to the point
9 that it would be so annoying that it would cause somebody
10 to have a health problem. I haven't seen any settings
11 where shadow flicker's been above that level.

12 COMMISSIONER NELSON: Thank you. I appreciate
13 that. I realize it's a hypothetical question because
14 we're placing those limits there, but was curious. So
15 thank you.

16 THE WITNESS: Yeah. I understand.

17 COMMISSIONER FIEGEN: Thank you. Just a couple
18 of quick questions.

19 When you started your opening brief comments, I
20 just needed -- I need you to clarify because I don't
21 think I was listening well enough.

22 You said something about noise does not cause
23 any health effects? Is that what you said?

24 THE WITNESS: No. I didn't say noise doesn't
25 cause health effects.

1 COMMISSIONER FIEGEN: See. I wasn't listening
2 well.

3 THE WITNESS: Certainly noise, like any
4 potential hazard, depending on the level and degree of
5 exposure, essentially how high and how long, can be a
6 problem.

7 I wouldn't want people to be unprotected in
8 noise levels over 85 for any long period of time, for
9 example.

10 COMMISSIONER FIEGEN: Okay. Thank you. I just
11 needed to clarify that because I wasn't obviously
12 listening well enough.

13 The other item that you brought up when Chairman
14 Hanson was asking you, you brought up the Canada study,
15 and you said there could be sleep issues in the Canada
16 study within a certain distance.

17 What is that distance?

18 THE WITNESS: I'm not sure I stated that,
19 frankly.

20 COMMISSIONER FIEGEN: You said something about
21 distance and if you sleep within -- and I might just stop
22 and see if Cheri can find the question. Or your comment
23 on that so I can have it clarified.

24 (Discussion off the record.)

25 (Reporter reads back a portion of the testimony.)

1 COMMISSIONER FIEGEN: I just wanted to have you
2 clarify that statement on what that distance was.

3 THE WITNESS: Oh. In the Health Canada Study,
4 to the best of my recollection, I think that the
5 residences were anywhere from a half a mile to 10 miles
6 away. It may have been 11. I'll have to go back and
7 take a look at the study, but that was the general range.

8 But as I have testified in other settings, in my
9 view, the key measurement is really the noise level, not
10 so much distance because, as I'm sure you've heard from
11 many noise experts, the topography associated with the
12 land associated with the wind turbines has a lot to do
13 with what the noise levels will be, even at the same
14 distances. So I prefer to use the noise metric as the
15 key parameter.

16 COMMISSIONER FIEGEN: Okay. Thank you.

17 MS. CREMER: Crowned Ridge, did you have
18 redirect?

19 MR. MURPHY: No.

20 MS. CREMER: All right. Thank you very much for
21 your testimony. You may step down.

22 And, Crowned Ridge, you may call your next.

23 THE WITNESS: Thank you.

24 (The witness is excused.)

25 MR. MURPHY: Thank you. I call Dr. Ollson.

1 (The oath is administered by the court reporter.)

2 DIRECT EXAMINATION

3 BY MR. MURPHY:

4 Q. Please state your name, business title, and company
5 for the record.

6 A. It's Dr. Christopher Andrew Ollson, Ollson spelled
7 O-L-L-S-O-N. I'm the owner and senior environmental
8 health scientist at Ollson Environmental Health
9 Management.

10 Q. What is your role with Crowned Ridge Wind II?

11 A. My role with Crowned Ridge Wind II first began in
12 late 2016 when Crowned Ridge Wind II engaged me in their
13 discussions with all three counties during the planning
14 and the ordinance changes that they were looking at.

15 I worked on proper health and siting for this
16 project and participated in all three CUP hearings and
17 then preparing testimony for the hearing here today.

18 Q. Please provide a short overview of your education
19 and experience.

20 A. I hold a bachelor of science in biology from Queens
21 University in Canada. I have a master's and Ph.D. in
22 environmental health and environmental sciences from the
23 Royal Military College of Canada. Over the last 20 years
24 I've been an environmental health consultant, and I also
25 hold adjunct professorships.

1 In addition to this, as part of my consulting
2 experience over the last 10 years I've led a research
3 group and published six scientific publications on wind
4 turbine and health. Here specifically in South Dakota
5 I've worked on the Dakota Range Project with Apex, the
6 Tatanka Project with Avangrid, and both Crowned Ridge I
7 and II projects for NextEra.

8 Q. Did you file Prefiled Supplemental Testimony and
9 exhibits on September 28, 2019, Exhibit A12, A12-1
10 through A12-16, and Prefiled Rebuttal Testimony on
11 January 8, 2020, Exhibit A20?

12 A. Yes.

13 Q. Do you have any changes or corrections to the
14 testimony or exhibits?

15 A. No, I do not.

16 Q. Please provide a short overview of your prefiled
17 testimony.

18 A. Thank you.

19 I believe that the weight of scientific evidence of
20 over 100 peer-reviewed scientific papers published in the
21 last 15 years in this field indicates that the Crowned
22 Ridge Wind II project as proposed meets the test for a
23 properly sited wind project.

24 Specifically, the standards that there will be no
25 shadow flicker at homes of over 30 hours without a waiver

1 and that no more than 45 decibels of sound at the
2 exterior of homes for nonparticipating residents and
3 50 decibels for participating residents align with the
4 project not posing a potential health or welfare risk to
5 the county residents.

6 Of course, separately there continues to be this
7 question of what role, if any, annoyance plays in health
8 and welfare. Scientific papers clearly show that the
9 sound produced by a wind project has little to do with a
10 reported annoyance living around wind turbines.

11 As Dr. McCunney just indicated, the annoyance is
12 actually more strongly linked to the visual cue, so the
13 ability to see the turbines, and how many you may have at
14 the exterior of your house, the underlying attitude of
15 those prior to the project coming and how they feel about
16 the project after it's built. So that's what tends to
17 lead to the reports of annoyance of those living around
18 wind turbines, and it's not actually the sound itself.
19 It's only a small portion of the annoyance.

20 As I said in Crowned Ridge Wind I, I'm not
21 downplaying that some people are annoyed living around
22 wind turbines. Not at all. Instead it's my role as the
23 PhD researcher in this field to place annoyance into
24 perspective, given the scientific literature.

25 And maybe to Commission Hanson's earlier question,

1 in fact, since my testimony in Crowned Ridge Wind I there
2 has been a recent series of peer-reviewed studies
3 published from the Lawrence Berkeley National Laboratory
4 here in the United States, and the paper referenced in my
5 Direct Testimony was from Dr. Hubner and her colleagues
6 titled Monitoring of Annoyance and Stress Effects of Wind
7 Turbines on Residents.

8 COMMISSIONER FIEGEN: Off the record.

9 (Discussion off the record.)

10 A. So, again, this study is entitled Monitoring
11 Annoyance and Stress Effects of Wind Turbines on Nearby
12 Residents, a comparison of U.S. and European samples.
13 And this was a survey of over 1,700 people living in the
14 U.S. around wind facilities.

15 They concluded that the average annoyance levels of
16 residents near wind farms in Europe and the United States
17 were low, with the levels for noise similar across both
18 the European and the U.S. samples. However, they did
19 find that European levels of annoyance were slightly
20 higher for shadow flicker, lighting, and landscape
21 change.

22 In addition, the small number of complaints that may
23 be associated with wind projects also can't be correlated
24 with noise. And that's within my testimony. While there
25 is always some likelihood that individuals will

1 experience annoyance due to visual queues or attitudes,
2 the scientific literature supports that if the same sound
3 and shadow flicker thresholds imposed by this Commission
4 in Crowned Ridge Wind I are imposed for Crowned Ridge
5 Wind II, the project will not pose a health or welfare
6 risk to the county residents.

7 MR. MURPHY: Thank you.

8 I offer Dr. Ollson for cross-examination.

9 MS. CREMER: Thank you.

10 Mr. Swanson.

11 MR. SWANSON: Thank you.

12 CROSS-EXAMINATION

13 BY MR. SWANSON:

14 Q. Dr. Ollson, I think you were here for part of
15 Mr. Haley's testimony this morning.

16 A. I was here for all of it, yes.

17 Q. You were here for all of it. All right. I believe
18 it was Mr. Haley who told us about the so-called
19 greenhouse receptor?

20 A. For the shadow flicker modeling, yes.

21 Q. Yes. Are you familiar with that receptor?

22 A. Well, I'm familiar with how shadow flicker modeling
23 is conducted and how they use what we call the greenhouse
24 receptor as everyone of the home's in that model, yes.

25 Q. Well, maybe Mr. Haley identified this, but based on

1 my understanding of what shadow flicker is and how you
2 regard it, I'm trying to get the dimensions on the
3 greenhouse receptor, if you know.

4 How big is that receptor?

5 A. So the way -- my understanding, the way the model
6 works is that it kind of goes beyond just the home
7 itself. So what they're calculating is the potential for
8 shadow to be cast across the project area. So those are
9 those isopleth lines that you see so that we can actually
10 predict where the shadow's going to be, what the flicker
11 effect is.

12 And then I think Mr. Haley correctly identified,
13 when we refer to shadow flicker from the turbines, it's
14 within an enclosed space within the home. So the model
15 is for each of the houses that are within the project
16 area. They model when the shadow hits that building in a
17 greenhouse gas -- excuse me. Not greenhouse gas. In a
18 greenhouse mode what it predicts is that no matter where
19 the shadow's coming from, that it will enter the house on
20 a one-by-one meter window of dimension.

21 Q. All right. So there's one one-by-one meter
22 entrance?

23 A. So essentially probably without getting into those
24 type of weeds, what you can envision is that if it was
25 the house -- let's say it was the court reporter's table

1 here, okay, and we were wind turbines all around her
2 table, did any of the shadow flicker from these turbines
3 that the sun's rising in the east, setting in the west,
4 as the sun's rising, if there's potential for flicker
5 onto the table -- let's say it was the house -- no matter
6 what the levels they were predicting that would be into
7 the home --

8 So let's say they were predicting -- and then as the
9 sun's setting in the west at counsel's table over there,
10 the ability for a shadow, if they were turbines, in the
11 house. So no matter where the shadow's coming from and
12 if it's predicted to hit the house itself, that would be
13 flicker inside the home.

14 Q. So if it hits any area of the house, even though the
15 receptor itself is a one-by-one meter --

16 A. Essentially, if the shadow is going to be cast where
17 the house is, it's assuming that the shadow cast at that
18 home would be inside the house, yes, is essentially the
19 default that occurs --

20 Q. Right -- I'm sorry.

21 So it assumes it enters the house then if it hits
22 any part of the house?

23 A. Essentially, yes.

24 Q. Well, wouldn't you have to have the dimensions of
25 every house in order to make that determination?

1 MR. MURPHY: Objection. I've let this go
2 probably longer than I should have. He did not proffer
3 the model in this proceeding. That was Mr. Haley. And
4 this is outside the scope of his testimony. It's
5 essentially accepting the results of Mr. Haley's model.
6 He did not investigate the model itself or produce it.

7 MR. SWANSON: Simply probing his knowledge. He
8 is an expert on shadow flicker. I think he is an expert
9 on how shadow flicker is gathered, determined, and
10 quantified. And I think it's a fair point of inquiry.

11 COMMISSIONER NELSON: Sustained.

12 MS. CREMER: Kristie, we have one yes, one no.

13 COMMISSIONER FIEGEN: Unless he rephrases the
14 question, I would sustain it too. Yes, ma'am.

15 MS. CREMER: So I will sustain the objection
16 and -- I'll sustain it and leave it at that.

17 Q. (BY MR. SWANSON) Well, let's go look at something
18 else, Mr. -- Dr. Ollson.

19 Let's go to Exhibit A12. And for some reason my
20 pages aren't paginated, but it would be the second to the
21 last page of that exhibit.

22 A. The one that starts with "shadow flicker shall not"?

23 Q. Yeah. Go to the page before that, though.

24 A. "Therefore, there is nothing"?

25 Q. Yes. Yes.

1 A. I'm there.

2 Q. "Therefore, there is nothing." And let's go to
3 line 10.

4 And we're talking here about your knowledge of the
5 origins of the shadow flicker standard; correct?

6 A. That's correct.

7 Q. All right. Now when you are referencing the 30-hour
8 shadow flicker threshold standard, can I assume we are
9 talking about in your parlance the narrowing of shadow
10 flicker only to the extent that it is perceived within a
11 home?

12 A. Yes. Internationally and here in the U.S. when
13 we're looking at shadow flicker and we're looking at
14 whether it's a local county ordinance or, for example,
15 the State of North Dakota, their PSC has set a 30-hour
16 shadow flicker limit, the Germans, you name it, it's
17 always the shadow flicker at the home is what is
18 regulated.

19 Q. All right. Apart from the regulation of shadow
20 flicker inside the home, is there, nonetheless, an
21 observance of shadow or shadow flicker outside the home
22 that can be an annoyance or a disturbance?

23 A. So the very -- they're two different phenomenon. So
24 inside the home, and as Mr. Haley described, what shadow
25 flicker is is it's essentially a strobing -- it's a very

1 lazy strobing, albeit, but it's a strobing of light
2 changing --

3 Let's say you were at your kitchen window preparing
4 dinner, and you had shadow flicker a few minutes in the
5 home. You're going to notice it in the house.

6 The difference is when we go outside the house
7 there's a lot of light fraction. You know, we're outside
8 the home. What we're seeing is the turbine when it casts
9 a shadow in your field or let's say your yard, you're not
10 getting that same flicker effect as you're getting as a
11 long, lazy shadow in itself.

12 The body of literature and the research that has
13 been done, looking at annoyance living around wind
14 turbines, for the most part has entirely focused on that
15 flickering in the home. Because the residents don't
16 report being annoyed by the flicker on let's say the farm
17 field or in the yard.

18 So the annoyance that we see and we characterize,
19 whether it's the Health Canada Study, whether it's the
20 other shadow flicker studies that have been done around
21 the world talking about annoyance, it is in the home
22 itself.

23 Q. All right. And if I understand you correctly then,
24 none of the regulations that control shadow flicker deal
25 with that phenomenon when it's outside the home such as

1 on an open field or in an open environment.

2 A. Yeah. That's correct. Because what we're looking
3 at there is that it's just merely a shadow like cast
4 outside the home, like any other shadowing that you would
5 get. So there is some questions that come in the
6 literature of do you see shadows at the exterior of your
7 home? Do you experience shadow flicker inside the home?

8 And the focus and the research and all of the
9 standards is on limiting to some reasonable number the
10 amount of shadow flicker you'd experience in the house
11 itself.

12 Q. All right. Is there any governmental agency in the
13 United States to your knowledge that attempts to regulate
14 shadow itself, not experienced inside the home so that
15 it's shadow flicker but outside the home such as, for
16 example, the same phenomena of light passing through the
17 spinning blades of the turbine that is then received on,
18 let's say, a busy interstate where there's traffic
19 passing?

20 A. So, no, there is not. So I've worked in over 20
21 states here in the United States and looked at the shadow
22 flicker regulations. And I can tell you they're not.

23 And maybe to talk about that interstate question
24 that you just posted, it's -- so you've -- pretty much
25 everybody in this room has experienced driving along the

1 interstate when the sun's low in the sky and you're
2 getting that flickering through the trees and you get
3 that kind of flicker effect through the trees as you're
4 driving. And that rate of flicker that you're seeing in
5 the car is much, much, greater than the rate we have
6 here.

7 If you're driving through a wind project, you know,
8 again, let's say it's early in the morning or late in the
9 evening, as you get the shadows cast onto the roadway --
10 it doesn't have to be an interstate, the gravel road,
11 whatever have you -- you're passing through that shadow,
12 you know, instantly almost.

13 You're not getting a flicker effect from a wind
14 turbine as it's casting the shadow on the road because
15 you're simply passing that shadow instantly as you drive
16 by. It's not the same effect as you get through the
17 trees.

18 Q. In your parlance, however, you would call that
19 shadow as opposed to shadow flicker?

20 A. No. In terms of what you get from the trees, that
21 is shadow flicker because it's flicker and you're seeing
22 the light change.

23 Q. Okay. And as part of my question I had asked about
24 a turbine that is situated close enough to a road so that
25 when the sun is in the right position it will cast that

1 rotating passing shadow onto the traffic.

2 A. And, again, as I indicated, there are no regulations
3 in any of the states or counties, the over 20 states and
4 numerous counties that I've worked in that govern that.
5 Quite simply because you're passing through that shadow
6 so very quickly, it won't affect.

7 Q. Just so -- again, I appreciate that. Just so that
8 you and I understand each other, you only refer to that
9 phenomenon as shadow when it's passing over cars or
10 traffic on a roadway?

11 A. Yeah. I would still characterize that as shadow.

12 Q. Let's go to -- the exhibit that you are referencing
13 in your passage here on A12, if we were to continue
14 reading, you were talking about Exhibit CO-S-16, which
15 you've been kind enough to present both in German and
16 English, although I don't understand a word of German but
17 let's go to that.

18 A. I have it in front of me. Thank you.

19 Q. Give me a moment.

20 Let me ask you this question: Are you familiar with
21 the NARUC Best Practices Report from January of 2012?

22 A. I am.

23 Q. Were you a contributor to any of the literature or
24 reports that were cited in Tom Stanton's work that
25 resulted in the Best Practices Report?

1 A. I would have to check. It is possible that the
2 Knopper and Ollson paper from 2011 may be referenced in
3 there. I just don't know off the top of my head.

4 Q. All right. One of your other witnesses here,
5 Mr. Lampeter, I believe his PowerPoint is cited in the
6 NARUC Best Practices Report.

7 Are you familiar with that PowerPoint?

8 A. I believe you're referring to a shadow flicker
9 PowerPoint presentation that Mr. Lampeter put together in
10 early 2010, 2011 time frame? Yes.

11 Q. Yes. And so you've seen that PowerPoint?

12 A. I have. I do not have it in front of me, but I have
13 seen it.

14 Q. Right. Now I don't believe your Exhibit A12-16
15 mentions this, but I understand from Lampeter's
16 PowerPoint that the German concept of shadow flicker
17 regulation may have started with an opinion of a judge in
18 Germany.

19 Are you familiar with that?

20 A. I am. And, in fact, that's one of the -- I believe
21 it was a Staff question and informational request from
22 Staff. I provided a much more detailed 8 to 10 page
23 report on shadow flicker and the origins of it and the
24 German standard.

25 Q. All right. Is that in this case?

1 A. It is. It was -- I'd have to look to counsel, but I
2 have the question here. I'm not sure exactly when --

3 The letter dated September 12, 2019. The Staff
4 question was, "Did the Applicant base its
5 30-hour-per-year shadow flicker limit on any other factor
6 other than the county ordinance? If so, please support."

7 And then there is a -- I sponsored that response,
8 and there is an eight-page letter that accompanies that,
9 plus all the documentation.

10 Q. Did you include in that documentation -- I'm not
11 able to find that offhand, but did you include in that
12 documentation the judge's opinion, per chance?

13 A. I did not.

14 Q. Have you ever seen the judge's opinion?

15 A. I have several years ago. It is in German.

16 Q. Do you know what year that was issued?

17 A. I believe it was 2011.

18 Q. Oh, so there's a 2011 opinion --

19 A. So perhaps maybe to clarify, I mean, where the
20 origin of the shadow flicker standard comes from in
21 Germany is that the Germans and, of course, many European
22 countries were erecting wind turbines a lot earlier than
23 we were here in the United States in close proximity to
24 people.

25 And so what happened was one of the states in

1 Germany had a shadow flicker standard that they were
2 referring to, which is in here and in this documentation.
3 That went then to the courts. And they then from there
4 codified it into German law with their shadow flicker
5 standards in Germany.

6 And it was basically from there that other
7 countries, including here in the U.S., we adopted not the
8 exact same standard but standards that suited the
9 jurisdiction that we're in. For example, here in
10 South Dakota similar that has occurred in the last number
11 of hearings where the no more than 30 hours of actual
12 shadow flicker comes from.

13 Q. Okay. So the document that is A12-16, and I think
14 it's dated March 13 of 2002, is that the originating
15 document as far as you know that began the shadow flicker
16 regulation?

17 A. They're actually -- I believe it is just prior to
18 this. There was one of these states in Germany in the
19 late 1990s -- the date would be somewhere in the '97,
20 1999 time frame -- that had adopted the standard and then
21 since then has been perpetuated through the German
22 system.

23 Q. So this has a -- so is this a German state document
24 that we're looking at in A12-16?

25 A. This is actually the country -- as you see at the

1 title of the document, it's the country committee on
2 important protection. So it's actually a national
3 commission, as far as I'm aware.

4 Q. All right. And this was based then on a more
5 localized regulation of some sort?

6 A. Yes. So it would be the equivalent of, you know,
7 the State of South Dakota had a regulation, a standard,
8 and then, for example, if the DOE was to look at it
9 nationally here in the U.S., it's the equivalent to
10 that.

11 Q. Well, let's go to page 6 of that exhibit, if you
12 would, please, the one that's in German and English.

13 A. Yes. I'm there.

14 Q. All right. The last English entry on that page
15 begins with the word -- the words "the actual emissions
16 that occur at an emission location."

17 Do you see that?

18 A. I do.

19 Q. All right. And it goes on to discuss, before that
20 paragraphs ends, a limit of 30 hours per calendar year.
21 And then it goes on to say and, "beyond no more than
22 30 minutes per calendar day."

23 A. That is what it says, yes.

24 Q. All right. Now would you agree with me that that
25 part of the limit that we just read in quotes did not

1 make it into any kind of a land use control in the three
2 counties we're dealing with here?

3 A. So yes. It did not, which is very common here
4 within the United States, no matter where you are.

5 Typically in the U.S. and, as I say, and the other
6 jurisdictions have all adopted a shadow flicker that they
7 seem reasonable to limit the nuisance from shadow
8 flicker. And it is very common across the United States,
9 similar to what Deuel County, Codington County, and Grant
10 County adopted, was just the no more than 30 hours of
11 shadow flicker, actual shadow flicker here at the homes.

12 So it's very common in the U.S., in Canada, in other
13 jurisdictions where they did not adopt the no more than
14 30 minutes at a time.

15 Q. So in your estimation was that done to simplify the
16 regulation?

17 A. I believe what happened was that at the time when
18 this started becoming more prevalent in the United States
19 in the kind of mid-2000s and into the, you know, 2010 and
20 beyond range is that people were looking for a number
21 that seemed reasonable. And then it was essentially a
22 hybridization of taking this German standard and adopting
23 it across many counties.

24 And, for example, Connecticut, North Dakota to adopt
25 a no more than 30 hours only shadow flicker and not

1 worrying about the number of minutes at a time.

2 Q. Was the NARUC best practices document in your
3 estimation the main impetus to having this German
4 standard imported into the United States?

5 A. No, not at all. I mean, in fact, to clarify the
6 NARUC document, this was a document that was contracted
7 for Mr. Hessler to do an initial review for NARUC on a
8 best practices guidance. It was sponsored by the State
9 of Minnesota.

10 When you look at it and you look at the NARUC
11 document it was just a guidance document similar to many
12 other guidance documents. It's really never been adopted
13 by any state. So, for example, the State of Minnesota
14 itself never adopted the best practices of the NARUC
15 document, even though they sponsored it.

16 Their sound level, for example, is 50 decibels at
17 the exterior of homes, not the 45 or maybe even the 40
18 recommended in the NARUC document.

19 Q. Did they not adopt the shadow flicker recommendation
20 either, to your knowledge?

21 A. To the best of my knowledge as I sit here, the State
22 of Minnesota I believe may have the 30 hours. I would
23 have to look at the actual Minnesota document to
24 understand for the state.

25 Q. Let's go to page 7 of that same document.

1 A. I'm there.

2 Q. Okay. Then we have the first passage in English
3 that begins, "If the values are exceeded," et cetera?

4 A. Oh, I'm sorry. Page 7?

5 Q. Yeah.

6 A. Page 7 for me has a 4.2, and then it's just a German
7 paragraph.

8 Sorry. Could you maybe tell me which -- sorry. I
9 apologize, counsel. I'm in the German only version. So
10 let me back up into the --

11 Q. Yeah. I would not be in the German only.

12 A. Neither would I. Sorry. One second.

13 Q. Do you read German?

14 A. I do not. We included the German so that the
15 original document is part of the record as well as then
16 the translation. So I'm now at page 7 that you're
17 looking at.

18 Q. Well, I have to say the English part here looks like
19 a very poor translation, in my opinion.

20 But let's go to the last sentence of that paragraph
21 in English on page 7.

22 A. The paragraph that starts, "If the values are
23 exceeded"?

24 Q. Right.

25 A. So the last sentence?

1 Q. Right. Well, let's actually go --

2 A. Yes.

3 Q. I'm sorry. Let's move up to the sentence preceding
4 that where it says, "Since the value of 30 hours per
5 calendar year," I'll just read it, "was developed on the
6 basis of the astronomically possible shading" -- is that
7 a reference to shadow flicker, by the way?

8 A. It is.

9 Q. Okay. "A corresponding value for defeat
10 automobiles" -- see my point about what a crumby
11 translation this is? Is the --

12 Do you know what that means, "defeat automobiles"?

13 A. That should have been default, I believe.

14 Q. "Is determined for the actual real shadow duration,
15 the meteorological shading duration."

16 And then finally we get to this sentence, "Based on
17 [2]," which I assume is a reference to an article that is
18 referenced in this at the -- at the end, "this figure is
19 eight hours per calendar year."

20 A. Yes. That's what it says.

21 Q. What does that mean?

22 A. So the way that the German standard differs from the
23 commonly adopted U.S. standard is the German standard has
24 a 30 hour of astronomical, meaning the worst case, the
25 hypothetical similar to what Mr. Haley's model produces,

1 and then if you were to correct that for the sunshine
2 probabilities, the operation probabilities of the wind
3 turbine, that they allow for no more than eight hours of
4 actual shadow flicker.

5 But, again, similar to what we'd have here. But as
6 I put into the Staff response in their request, every
7 jurisdiction has their own shadow flicker limits, some
8 loosely based on the German initial standard.

9 In the U.S. it's very common, similar to what has
10 been adopted by this Commission in the past, that the
11 30 hours of shadow flicker is based on taking the
12 astronomical or the worst case and then apportioning it
13 for the probability that the sun is actually going to be
14 shining -- the sun does not shine every day of the year.
15 So that's what we're looking at here.

16 Q. Well, this is South Dakota, and we are the Sunshine
17 State, I believe.

18 MS. CHRISTENSON: The sun doesn't shine every
19 day of the year? What?

20 THE WITNESS: Directly to that, no, it doesn't.

21 MR. MURPHY: Objection. Don't answer that
22 question. We're getting a little kind of informal.

23 Q. If I understand what you've just told me,
24 Dr. Ollson, then the German standard at least would limit
25 the actual shadow flicker to eight hours per calendar

1 year?

2 A. It does. And, again, unlike the U.S. standard
3 commonly adopted, which is no more than 30 hours, similar
4 to Canada and other jurisdictions. So it is not a direct
5 adoption of the German standard. Just like many other
6 countries and other jurisdictions.

7 Q. In your work have you ever studied or made an effort
8 to determine whether those who are receptors might have a
9 property interest in not receiving shadow flicker?

10 A. Certainly in my work my concern is not the property
11 interest, I believe, as you're describing.

12 Q. All right.

13 A. It's ensuring the protection of the people who live
14 in that home and reducing their nuisance and annoyance,
15 which I believe we've done.

16 MR. SWANSON: Thank you.

17 MS. CREMER: Thank you.

18 Ms. Christenson.

19 CROSS-EXAMINATION

20 BY MS. CHRISTENSON:

21 Q. Hi, Dr. Ollson. I apologize. When you said the sun
22 doesn't shine every day I'm like what?

23 A. That's okay.

24 Q. I thought it did. It is today.

25 Okay. So you are not a medical doctor; that's

1 correct?

2 A. I am not.

3 Q. Your doctorate of philosophy is
4 environmental-science based?

5 A. My degree is a Ph.D. or a doctor of environmental
6 science, focused on environmental health sciences, yes.

7 Q. How does chemical toxicology figure into your degree
8 or your --

9 A. It's certainly one of the basis of my degree. I
10 mean, my degree is in looking at environmental risk and
11 health from stressors in the environments, everything
12 from arsonic to particulate matter in the air to, in this
13 case, noise and shadow flicker.

14 Q. I wasn't able to find a copy of your -- I don't know
15 if it's called a doctoral thesis or whatever. Did you
16 actually write a paper, or was that a project?

17 A. No. It was a very large dissertation on the effects
18 of -- I could look up the actual -- it's the effects of
19 bioavailability of arsonic exposure.

20 Q. I'm really glad I couldn't find it.

21 Did Crowned Ridge Wind II retain your services in
22 the area of waste disposal?

23 A. They did not.

24 Q. Would that be something that would be I would say in
25 your purview or in your expertise considering your

1 environmental science?

2 A. I would have to hear the question. I mean, I
3 certainly do deal with waste facilities. But I'd have to
4 hear the question before I could tell you if I could
5 answer it or not.

6 Q. Okay. Maybe I'll go on a little more.

7 Did Crowned Ridge Wind II retain your service for a
8 study pertaining to infrasound or low frequency noise?

9 A. Certainly throughout the course since 2016 while
10 appearing numerous times in front of the three county
11 commissions and their planning and zoning commissions,
12 submitted a number of reports similar to what's in front
13 of the Commission here today, discussing infrasound and
14 low frequency noise and why it would not be a concern for
15 the Crowned Ridge project or why they would not have to
16 include it specifically in their ordinance.

17 Q. But nothing for this particular project; right?

18 A. In terms -- it was an overview of the knowledge of
19 the scientific literature of infrasound and low frequency
20 noise and what would be expected from this project and
21 why we would not be concerned.

22 Q. Okay. I read in your Supplemental Testimony that
23 you teach a graduate course on environmental risk
24 analysis. In your opinion, what would be the potential
25 risk of disposal of millions of pounds of Fiberglass to

1 people?

2 A. So in terms of the actual disposal, I mean, first of
3 all, the Fiberglass blades to my understanding are an
4 inert substance in that nothing leaches out or comes out
5 of that Fiberglass material. It would have to be
6 disposed of in a properly licensed landfill, and that
7 landfill itself would be monitored.

8 But there's nothing from the blades that would come
9 out of the blades and enter into the environment and
10 impact health. So I would say there would be no undue
11 risk from anybody living around the landfill of blades
12 being disposed of.

13 Q. So a blade would not be able to be disposed of
14 anywhere but a licensed landfill? Like it couldn't be
15 retained on a leased property of a farmer?

16 A. That, I'm not aware of. But even if it was on let's
17 say the leased land of the farmer, there's nothing that
18 would be coming from that blade entering into the
19 environment that would impact health. They're Fiberglass
20 blades.

21 Q. And would that answer be the same including animals,
22 domestic and/or wildlife?

23 A. Yes.

24 Q. I'd like to talk to you about flicker. And some of
25 my questions are similar to Mr. Swanson's so I apologize

1 if I get duplicative. I'm going to try not to.

2 You were instrumental in the building of the three
3 county ordinances that comprise this project. I consider
4 that a fair statement.

5 A. I certainly appeared in front of the three counties
6 on numerous occasions, as you well know, and I believe
7 that -- yes.

8 Q. Okay. And in your recommendations as environmental
9 scientist you did make recommendations for 30 hours of
10 flicker per year; correct?

11 A. Yes. The recommendation that I sponsored on behalf
12 of Crowned Ridge Wind to all three county commissions was
13 that adopting a no more than 30 hours of shadow flicker,
14 of actual shadow flicker a year, would be reasonable to
15 reduce the nuisance, potential nuisance, or annoyance
16 from wind turbines, yes.

17 Q. Did you make any recommendation as to limiting the
18 amount of flicker daily?

19 A. No. And the reason why, and I believe it was in
20 front of this Commission as well as it was in Crowned
21 Ridge I, is that when we do look at the limited number of
22 studies, such as the Health Canada Study that also looked
23 at shadow flicker and a peer-reviewed published paper on
24 that is that there's actually no correlation between
25 either the number of minutes at a time or even 30 hours a

1 year in science to say that it has no impact on the
2 annoyance.

3 So, in other words, this 30 hours of no more than
4 30 hours a year is actually fairly conservative in trying
5 to limit the amount of annoyance. It's less than
6 .1 percent of the number of hours a year that you could
7 potentially have flicker.

8 Q. Without me pulling up the German study or the German
9 document, because I think you're very familiar with
10 that --

11 A. I am.

12 Q. -- they did mention and I'm not sure of the exact
13 wording. I didn't write that down. But they did mention
14 that 60 minutes per day would be a health something. So
15 that's why they went back to the 30.

16 A. I'd have to go back through the German document.
17 But certainly what we're talking about there, that health
18 was a nuisance, not a true health impact. It's more of a
19 nuisance or annoyance.

20 And why they decided to limit it, was in their
21 opinion that it was a reasonable amount. But, again,
22 what we see here in the United States, when we limit the
23 number of hours of shadow flicker to no more than 30 a
24 year, that that reduces the annoyance. There are no
25 health effects beyond -- for example, if you had

1 100 hours of shadow flicker, that is not going to result
2 in a health impact. We don't see that resulting in a
3 health impact.

4 We're simply trying to limit it to a nuisance effect
5 and something that would be reasonable so we're not
6 unduly burdening the local neighbors.

7 Q. Since you're not a medical doctor, that would be a
8 little outside your scope. Am I correct?

9 A. No. In fact, with my Ph.D. and my training and
10 20 years of experience, what my role is to do is when we
11 do the surveys, the epidemiological surveys, when we're
12 doing it and conducting similar studies to, as
13 Dr. McCunney referenced, Health Canada those are not
14 typically done by the physicians. It's done by somebody,
15 for example, in my profession and the papers published.

16 Where the physicians come in is I can't diagnose
17 somebody and say this is something that caused me to
18 become sick. What we look at is the trends across the
19 population as to whether the population is actually
20 experiencing or reporting these things.

21 Q. Can I take a minute to pull up that German study?
22 Can we take just a momentary break?

23 MS. CREMER: Certainly.

24 MS. CHRISTENSON: Thank you.

25 Mr. Swanson to the rescue.

1 Q. Are you there, Mr. Ollson? Dr. Ollson. I
2 apologize.

3 A. I have the document. If you could take me to the
4 page.

5 Q. It's numbered page 9, 4.2. The first couple of
6 paragraphs there, can I just read those out loud, or
7 would you prefer to?

8 A. I'm happy to read it if you'd like. You're talking
9 about where it says, "In the laboratory study"? Or where
10 are you?

11 Q. The sentence above it, but then that next paragraph.
12 But if you read it, read it slowly for poor Ms. Cheri.

13 A. "The emission guide for the daily shading period is
14 30 minutes. In the laboratory study of the University of
15 Kiel," spelled K-I-E-L, it was found that even a
16 one-minute effect of shadow design of 60 minutes can lead
17 to stress reactions. For pension reasons, therefore, the
18 daily shading time is limited to 30 minutes."

19 Q. Thank you.

20 So stress reactions could cause a possible health
21 effect, do you believe, in your opinion?

22 A. So, again, it requires a lot more context.

23 So the study that they're referring to there is a
24 study by Dr. Jonas Pohl, P-O-H-L. And I could take you
25 to my Exhibit A12-10, I believe it is, Exhibit

1 No. A12-10, which is the study I was just describing as
2 being the recent study in the U.S. that's been published.
3 And Dr. Pohl was also part of that study, even though
4 he's German.

5 And what Dr. Pohl did was take a bunch of graduate
6 students, put them in a lab, and basically I think as
7 Mr. Haley was describing flickered the lights on and off
8 for 30 to 60 minutes and more. The stress reaction that
9 he's referring to there is not the same as we're talking
10 about with the cascading of the stress effects. He did
11 not go down that road.

12 It was more of a nuisance type of effect where he
13 was saying after 60 minutes of doing that, that the grad
14 students were not -- you know, they were not comfortable.
15 They weren't happy with that occurrence. And it would be
16 extremely rare that you'd get closer to the 60 minutes.
17 So --

18 But, again, within the study that he -- you know,
19 the reason that I draw the Commission's attention to
20 Exhibit A12-10 is that they go on now in this report --
21 or in this peer-reviewed paper, and this is the one
22 monitoring annoyance and stress effects, to discussing
23 shadow flicker and why the shadow flicker experienced in
24 the United States does not lead to stress effects.

25 So 20 years later we have the paper on the actual

1 stress effects that he was discussing in Germany.

2 Q. Okay. Thank you. So Germany being the original
3 30-hour, 30-minute, whatever study, was in 2002, I
4 believe you said?

5 A. 2002 is the date of the overarching document, yes.

6 Q. Okay. Do you know what the property rights of an
7 individual were according to their version of a
8 constitution in Germany at that time?

9 A. No clue.

10 Q. Thank you. In your Rebuttal Testimony, page 6?

11 A. Sorry. Bear with me one second. I'll get there.

12 Q. Okay.

13 A. Yes. I'm there.

14 Q. If you could read just the first sentence for us,
15 please.

16 A. Sure. The line 1 that starts, "Question: Do you
17 see any specific layout changes at this point?" Oh, I'm
18 in --

19 Q. No. Are we in Rebuttal?

20 A. I'm not wrong document. I'm sorry. I was in
21 Mr. Hessler's.

22 Sorry. I'm in the correct document now.

23 The first line on page 6 of 7 starts, "Answer: No.
24 Again, there will be nothing emitted from the wind
25 turbines. Example: Sound, infrasound, low frequency

1 noise, vibrations, or shadow flicker, that would cause
2 anyone's home in the project area to be unlivable."

3 Q. Thank you. So first I'll say these three words to
4 you, Shirley Wind Farm. Are you familiar with the
5 Shirley Wind Farm in Brown County, Wisconsin?

6 A. I am.

7 Q. Are you familiar with how many turbines were in that
8 wind project?

9 A. I would have to go back to the document itself,
10 but -- I'd have to go back to the document itself. It is
11 a smaller wind project than what's proposed here.

12 Q. Are you familiar with how many homes were abandoned
13 in that project?

14 A. So back in around the 2011 time frame there was
15 reports that three homeowners had left their homes in the
16 vicinity of the project.

17 Q. Okay. Thank you.

18 A. However, there was nothing ever done to show that
19 the project itself caused health effects.

20 Q. I don't need any more than that.

21 I'm referring back to some things that you testified
22 on today, and my first question I wrote was does this
23 project potentially pose an annoyance risk to any members
24 of the community?

25 A. I wouldn't characterize it as a risk. Will there be

1 some members of the community that may be annoyed from
2 having the project in the community? The answer is
3 clearly yes, like any other energy project or any other
4 wind project with 60,000 turbines across the
5 United States.

6 Q. Thank you.

7 And going back to talk about shadows on roadways,
8 when driving through a wind project and turbines being
9 sited 1.1 perhaps from blade tip to the edge of the road,
10 and there could be turbines close to each other on either
11 side of the road and spaced all along one side of the
12 road, when the wind -- or when the wind.

13 When the sun is casting shadows along the roadway,
14 there are times where the blades intermix. Like they're
15 not timed perfectly. Maybe that's a better explanation.
16 Do you think that could pose a risk on the roadway for
17 disorientation?

18 A. No. And the reason why, again, is, first of all,
19 there are 60,000 turbines across the United States.
20 There are over 800 here in South Dakota itself. And
21 certainly there are turbines that are located within
22 1.1 times tip height to roadways.

23 And, again, you're traveling at a speed -- you're
24 passing through that shadow without even recognizing it,
25 for the most part. You may see the shadow, but it's not

1 impairing or impacting the drivers.

2 Q. And then I want to clarify one thing for the record.
3 You talked about possibly the State of Minnesota having a
4 30-hour limit. Did you mean 30-minute per day limit?

5 A. No. What I said is I would have to look at the
6 statute for Minnesota. I don't have it in front of me.
7 I know that there is a 30 hour. I don't know if there is
8 anything more to the Minnesota off the top of my head.

9 MS. CHRISTENSON: Okay. Thank you. That's all
10 I have.

11 MS. CREMER: Thank you.

12 Mr. Robish.

13 CROSS-EXAMINATION

14 BY MR. ROBISH:

15 Q. Thank you. Good morning, Dr. Ollson.

16 A. Good morning, Mr. Robish.

17 Q. I didn't know if you said this in your earlier part
18 of your statement, but are you a member of the INCE an
19 Institute of Noise Control Engineers?

20 A. No. Because I'm not a noise control engineer. I
21 have attended some of their meetings, but I am not an
22 acoustical engineer. So no.

23 Q. Okay. Are there any complaints about flicker and
24 shadow outside the home?

25 A. In fact, we don't typically see complaints for

1 shadow flicker even in homes on projects that are built
2 these days. So no.

3 Q. Okay. Would they report that to you or to someone
4 else?

5 A. Well, when we're looking at both the body of
6 literature where we're seeing and we do the scientific
7 studies, for example the Health Canada Study that
8 Mr. McCunney just referred to, when they do their shadow
9 flicker study they're asking a series of questions
10 similar to what we have here and you asked with the
11 Lawrence Berkeley Laboratory.

12 They're asking do you experience shadow inside your
13 home, do you experience shadow flicker inside your home,
14 and then they look at how annoyed people have been to
15 that. And what we're seeing is the annoyance or the
16 nuisance effect is the shadow flicker in the home
17 itself.

18 Q. Okay. Thank you for that.

19 Do you think there are any adverse noise impacts or
20 sleep disturbances or health impacts from this project?

21 A. Not from this project as it's currently designed.
22 And the reason I say that is when you look at the bulk
23 and the weight of the scientific literature if you stay
24 below 45 decibels for nonparticipating homes, we don't
25 see that reported.

1 There's no sleep disturbance. It's not just Health
2 Canada. There's other sleep studies that have been done.
3 All the cascade of health impacts that can potentially be
4 there we're just not seeing.

5 So that's why we limit sound levels to a reasonable
6 level is to ensure we're having people get a good night's
7 sleep over the course of a 30-year project. That's why
8 45 decibels has been shown in the literature over and
9 over again to be a good protective number to ensure that
10 protection.

11 Q. Is that something you guarantee in writing or just
12 in testimony?

13 A. Well, it's a question that comes up. Will I
14 guarantee that in writing? I've certainly guaranteed it
15 in writing here in front of this Commission. I've
16 certainly just swore an oath with the court reporter.

17 So it is my belief that 45 decibels or less at a
18 nonparticipating home is going to be protective of
19 health.

20 MR. ROBISH: Thank you for your testimony.

21 THE WITNESS: You're welcome.

22 MS. CREMER: Staff.

23 CROSS-EXAMINATION

24 BY MS. EDWARDS:

25 Q. Thank you. In your Supplemental Testimony -- you

1 don't need to dig it out -- on --

2 I guess I don't know page numbers, but in your
3 Supplemental Testimony you refer to a North Dakota
4 statute. And based upon your experience, not a legal
5 interpretation, but if you know from your experience, in
6 the statement that says that North Dakota has
7 requirements -- or requires effects from the impact upon
8 light sensitive land uses, do you know from your
9 experience what they're referring to with light sensitive
10 land uses?

11 A. So my understanding, and having done numerous
12 projects in North Dakota, is that it's kind of an
13 overarch statute about light sensitive land uses. And
14 what they have adopted at the PUC level, similar as your
15 PUC past under these types of hearings, is a no more than
16 30 hours of shadow flicker at nonparticipating homes.

17 So not being a lawyer but that's the overarching
18 statute and then they use the 30 hours to satisfy that
19 rule.

20 Q. So you would say in your experience they tie that
21 light sensitive land use to homes?

22 A. Yes.

23 Q. Okay. Thank you. And going to that study, and,
24 again, you don't have to pull it out, with the U.S. --
25 the newer environmental study that was Exhibit A12-10,

1 that talked about annoyance, the study with the
2 United States and Europe?

3 A. Yes.

4 Q. Do you know if as part of that study did they take
5 into account the ambient noise in the areas -- in the
6 resident -- in the areas the respondents lived prior to
7 the wind farm?

8 A. So, in fact, this is the second part of a two-part
9 paper series. And the first paper is actually all of the
10 annoyance and the noise and all of the modeling that was
11 done.

12 What you have here is over 1,700 people living
13 around wind farms across the United States where -- very
14 similar to here in South Dakota and may have included
15 South Dakota projects where, you know, you're in rural
16 areas of the United States where the ambient level would
17 be similar as it is here.

18 Q. Thank you.

19 MS. EDWARDS: No further questions.

20 MS. CREMER: Thank you.

21 Commissioner Nelson.

22 COMMISSIONER NELSON: No questions.

23 COMMISSIONER FIEGEN: No questions.

24 CHAIRMAN HANSON: Good morning, Doctor.

25 THE WITNESS: Good morning, Commissioner Hanson.

1 CHAIRMAN HANSON: You would agree, would you
2 not, that some people are annoyed by wind turbines from
3 sight; correct?

4 THE WITNESS: Yes.

5 CHAIRMAN HANSON: And by sound.

6 THE WITNESS: Only a very small portion of the
7 annoyance is actually attributed to the sound itself. So
8 it is actually when you look at what are the factors to
9 that cause -- maybe if I can back up just a second, I'll
10 try not to go too far.

11 But when we're doing these surveys if you
12 received the survey from the Lawrence Berkeley Lab, you'd
13 get it at your home, and it has a question, Are you
14 annoyed by the wind turbines? Yes or no? Yes.

15 And then they go through like a five number
16 scale saying how annoyed are you to the sound? How
17 annoyed are you to the blinking lights? How annoyed are
18 you to the shadow flicker? How annoyed are you looking
19 at the turbines? What is your attitude towards the
20 project?

21 So then you take that the 1,700 people on this
22 one-off question that we've asked them over one period of
23 time, and we see what is actually -- we do an overall
24 annoyance, and then we see what is the biggest
25 contributor to that annoyance.

1 And what we see time again, whether it's been in
2 Canada, whether it's been in Europe, or here in the
3 United States, when we look at that ranking of what's
4 causing the annoyance it's the ability to see the
5 turbines and how many turbines you're seeing, it's the
6 attitude --

7 Not to downplay, but it's how do you feel about
8 the project? Are you receiving economic benefit? Are
9 you not? Did you want the project in your community?
10 And then as you go further down the scale, the noise
11 itself is a very small contributor to that overarching
12 annoyance.

13 CHAIRMAN HANSON: I hear that argument
14 significantly repeated throughout testimonies that
15 attitude is important here. But we shouldn't downplay
16 that, should we?

17 THE WITNESS: No, not at all. Certainly not.
18 In any energy project that I've worked on -- so I've
19 worked on everything from the pipeline projects that run
20 through the states to the gas-fired plants to coal plants
21 and the like, and I can tell you on any energy project
22 that I'm going to be working on there's going to be a
23 portion of the population -- sometimes in the city and a
24 gas-fired plant there's going to be a large number of
25 people that are not going to want the project and they

1 will be annoyed by the project. And just like the wind
2 turbines, you will have some portion of -- so it
3 shouldn't be ignored.

4 But then the question is does that annoyance --
5 is it so significant that it leads to undue stress? Does
6 it lead to sleep disturbance? Does it lead to health
7 effects?

8 What we know from wind turbines, if we reduce
9 the noise to 45 or less, we don't see the cascading
10 effects that we are concerned about when we start looking
11 at annoyance. But it certainly doesn't need to be
12 downplayed.

13 CHAIRMAN HANSON: Thank you for your testimony.
14 I'm going to have to dock you for not using the Oxford
15 comma, though, in your presentation.

16 MS. CREMER: Crowned Ridge, do you have
17 redirect?

18 MR. MURPHY: No, I do not.

19 MS. CREMER: All right. Thank you, Dr. Ollson.
20 You may step down.

21 (The witness is excused.)

22 (Discussion off the record.)

23 MS. CREMER: 1 o'clock we'll all be back here.

24 (A lunch recess is taken.)

25 MS. CREMER: I'll call the hearing back to

1 order. And we were still on Crowned Ridge's direct case.

2 MR. SCHUMACHER: Thank you. Crowned Ridge would
3 call Sarah Sappington.

4 (The oath is administered by the court reporter.)

5 DIRECT EXAMINATION

6 BY MR. SCHUMACHER:

7 Q. Please state your name, business title, and company
8 for the record.

9 A. Sarah Sappington. I work for SWCA Environmental
10 Consultants, and I'm the director of the Bismarck,
11 North Dakota SWCA office.

12 Q. What is your role with the Crowned Ridge Wind II
13 project?

14 A. My team is responsible for the environmental,
15 cultural, and wildlife studies for the Crowned Ridge II
16 wind project. I personally participated in or supervised
17 the environmental, natural, cultural, and wildlife
18 studies, surveys, and assessments, including the
19 Application and managing the natural and cultural
20 resources staff.

21 Q. Please provide a short overview of your education
22 and experience.

23 A. I have 16 years of experience in environmental
24 permitting and consulting, and I manage all aspects of
25 energy development projects in the Midwest, including

1 environmental permitting and cultural and natural
2 resources management.

3 I received my master's and bachelor's in
4 anthropology with an emphasis in archeology from Brigham
5 Young University in 2003 and 2001, respectively.

6 Q. Did you file Prefiled Direct Testimony and exhibits
7 on July 9, 2019, and updated on October 21, 2019, to
8 include page numbers marked as A3 and Prefiled
9 Supplemental Testimony and exhibits on September 20,
10 2019, that is marked as A18, A18-1, and A18-2 and
11 Prefiled Rebuttal Testimony on January 8, 2020, that is
12 marked as A24?

13 A. Yes.

14 Q. Do you have any changes or corrections to your
15 prefiled testimony?

16 A. No.

17 Q. Please provide a short overview of your testimony.

18 A. Thank you.

19 Crowned Ridge Wind has conducted desktop analyses
20 and site-specific field studies to determine the
21 potential for sensitive cultural and natural resources
22 for the project. Surveys were designed to adhere to the
23 regulations and guidelines, such as the United States
24 Fish & Wildlife, Land-Based Wind Energy Guidelines, and
25 the United States Fish & Wildlife Eagle Conservation Plan

1 Guidance, as well as state cultural resources laws, and
2 other water resources laws such as the Clean Water Act.

3 Crowned Ridge consulted with numerous state
4 agencies, including the United States Fish & Wildlife
5 Service, the South Dakota Game, Fish & Parks, the State
6 Historic Preservation Office, and also local and counties
7 as needed.

8 Crowned Ridge has continued to work with state
9 agencies on guidelines and recommendations for avoidance,
10 minimization, and mitigation for any impacts to the
11 project as detailed in the Application.

12 Desktop and field studies have been completed for
13 the project, and they include the following: Avian point
14 count studies and avian use studies, raptor nest and
15 eagle surveys, Dakota skipper and Poweshiek skipperling
16 habitat assessments, habitat surveys, adult occupant
17 surveys, grouse lek surveys, whooping crane habitat
18 assessment, bat habitat assessment, bat acoustic
19 monitoring, wetland and stream surveys, cultural resource
20 surveys in the form of a Level 1 Records Search and a
21 Level 3 Intensive Survey for cultural resources, as well
22 as coordination with local tribes for traditional
23 cultural property studies.

24 Some of the avoidance and minimization and
25 mitigation measures include not siting infrastructure on

1 United States Fish & Wildlife easements for grasslands or
2 combination grassland/wetland easements, not siting
3 within protected basins within the United States Fish &
4 Wildlife wetland easements, avoiding cultural resources
5 and tribal resources, avoiding impacts and minimizing any
6 impacts to wetlands to the extent practicable and under
7 the Nationwide Permit 12 Standards, siting all turbines
8 one and a half miles from known occupied eagle nests and
9 also ensuring that there are best management practices
10 put into place to avoid any other impacts to species or
11 resources.

12 MR. SCHUMACHER: Thank you. That concludes our
13 direct examination.

14 MS. CREMER: Thank you.

15 Mr. Swanson.

16 MR. SWANSON: No questions.

17 MS. CREMER: Ms. Christenson.

18 CROSS-EXAMINATION

19 BY MS. CHRISTENSON:

20 Q. Good afternoon.

21 A. Good afternoon.

22 Q. I'm going to be referring to the map behind you,
23 which is A27-2.

24 A. Okay.

25 Q. It's just a nice size of reference there. Looking

1 at the project's turbine placement, there is an array of
2 turbines along the lake area on the north and east of the
3 project. And many of those turbines are in green.

4 Do you see that?

5 A. Are you talking about the ones over here
6 (indicating)?

7 Q. Higher. All of -- yeah. That whole array right
8 there.

9 A. Okay. Those are blue.

10 Q. Oh, they are?

11 A. Yeah. Just making sure. I can see it a little bit
12 closer than you can.

13 Q. Thank you.

14 That whole -- there is a road that runs along those
15 lakes, and that whole area is pretty much a wildlife
16 wonderland. There's all kinds of game production and
17 walk-in areas, and there's just abounding wildlife there.

18 So during your studies and during your review of
19 this project did your company suggest to Crowned Ridge
20 Wind II to possibly not put turbines in that area because
21 of that wildlife population?

22 A. So in looking at this area, there are several lakes
23 there. There is also a known eagle nest that is out
24 towards that area as well that has been avoided by one
25 and a half miles. So that was a consideration for the

1 project area.

2 Thinking about the studies that were done for the
3 project, really this is an iterative review that takes
4 place for the project. So we start off with the desktop
5 studies, and in those desktop studies we look at areas
6 that can be seen that may be wildlife areas that include
7 those United States Fish & Wildlife wetland easements or
8 grassland easements or the combination grassland/wetland
9 easements as I discussed in my opening.

10 So we take into account all those different areas.
11 And the studies are really designed to look at the
12 Land-Based Wind Energy Guidelines for the project area,
13 as well as any of the guidelines given by the
14 United States Fish & Wildlife Service and the
15 South Dakota Game, Fish & Parks, and they're designed to
16 look at these sensitive species. So look at, you know,
17 eagles and whooping cranes, wetland areas, any impacts
18 that might happen in those areas.

19 There have been numerous studies for the turbines
20 and the siting of the infrastructure of the project, and
21 that's detailed in the Application. And so the way that
22 these turbines have been sited, areas have been cleared,
23 and we have seen that the impacts are minimal for those
24 areas.

25 Q. Okay. Thank you for that explanation. But

1 basically your answer is no to that array? You didn't
2 ever suggest to them not to build those turbines?

3 A. No.

4 Q. Okay. Thank you. Did you do a migration study for
5 that area?

6 A. And by migration can you tell me what exactly?

7 Q. Well, we have -- that area is a migration corridor
8 for geese, eagles. There's a high population of pelicans
9 who remain. There's ducks. There's just a lot of birds
10 in that area.

11 Is there a study that you performed for that?

12 MR. SCHUMACHER: I'm going to object to the
13 testimony part of that question.

14 MS. CREMER: And what would be the objection?

15 MR. SCHUMACHER: That she's providing facts not
16 in evidence.

17 MS. CREMER: Okay. That's what I assumed, but I
18 didn't want to make that --

19 So you understand his objection? You are -- you
20 got it?

21 MS. CHRISTENSON: I do.

22 MS. CREMER: So I'm going to sustain that.

23 MS. CHRISTENSON: I can rephrase?

24 MS. CREMER: Yes.

25 Q. Have you done any studies of bird migration in the

1 project area?

2 A. Okay. There are a couple different studies that
3 we've completed for the project. So we've completed
4 avian use studies, and this includes point count areas
5 that are done across the entire project area.

6 Essentially, biologists go out and they look at an
7 800 meter area and they look specifically for, you know,
8 six months to a year time at all the birds that are
9 flying in that 800 meter area.

10 So, specifically, if there are migration events that
11 are occurring during those times, then, yes, they would
12 be looked at. So different birds are seen. There might
13 be eagles that could be seen. If per chance there was a
14 whooping crane or, you know, other species, you know, we
15 would see them during that time.

16 And those avian use studies were completed in 2017.
17 But there were also numerous avian point count studies
18 completed over the years for almost the last 10 years on
19 this project.

20 Q. Okay.

21 A. So that is just one of the studies. We've also
22 completed raptor nest surveys. Those were completed in
23 2017 and 2018.

24 Q. Can I stop you there?

25 A. Sure.

1 Q. Can you give me the dates of the point studies? I'm
2 curious as to whether there was any studies during
3 migration. I'd kind of like to keep it to that scope
4 right now, please.

5 A. Okay. So in looking at my Direct Testimony, and
6 this is also in the Application, the Avian Use Survey was
7 completed in spring, in April through November 2017. So
8 that would include spring and fall migration time
9 periods.

10 Q. Thank you.

11 What is the closest distance a turbine in this
12 project is sited to a public road? I heard that you're
13 the authority on that.

14 A. And I looked it up just for you.

15 Q. Thank you.

16 A. The distance from turbines to public roads, the
17 closest one is Crowned Ridge II, 64. And it is 590 feet
18 from 171st Street. That does fall within the setback
19 distances as required and mentioned in the Application.

20 Q. Can you tell me that street again, please.

21 A. Yes. 171st Street.

22 Q. And is that to the center of the road?

23 A. I'm not sure if it's to the center or to the edge,
24 but you may be looking at 5 to 10 feet. So either way,
25 590. If you say it's greater than 10 feet, 580. The

1 setback distance at the maximum would be 533.

2 Q. Okay. Thank you.

3 A. You're welcome.

4 MS. CHRISTENSON: Commissioner Fiegen, I'm going
5 to jump in on your question about the interstate.

6 Q. She asked Mr. Wilhelm how close turbines would be
7 sited near the interstate, and we were told that you
8 would have that answer.

9 Do you have that?

10 A. Yes, I do.

11 Q. Can I have that one too?

12 A. Of course. The nearest turbine to I-29 is CR2-13,
13 and it is located 1.27 miles to the northeast of the
14 highway.

15 Q. Thank you.

16 Would there be a difference in siting for the safety
17 of the public or travelers on the interstate versus other
18 public roads?

19 A. As far as what are you referring to? What safety
20 are you referring to?

21 Q. Anything to do with the turbine, whether it be
22 shadows on the roadway versus ice sling versus any -- I
23 don't know what all the effects could possibly be, but
24 would there be a difference in siting on the interstate
25 versus a paved county road?

1 A. So that's outside of my scope. I just do the
2 environmental and wildlife studies so I wouldn't know
3 about siting next to the highway.

4 Q. Okay. Did your company conduct any studies
5 concerning shadows on the roadway?

6 A. No.

7 Q. Did your company conduct any study concerning shadow
8 effects on wildlife or domestic animals?

9 A. No.

10 Q. Did your company conduct any study concerning noise,
11 audible and inaudible, including low frequency noise or
12 infrasound on domestic animals?

13 A. No.

14 Q. In your Rebuttal Testimony, Exhibit A24, the page
15 isn't numbered, but it's the second to the last page.

16 A. Okay.

17 Q. I'm going to read that line. "Additionally, to
18 avoid the spread of noxious weeds, Crowned Ridge Wind II
19 will use native vegetation weed-free seed mixes to
20 re-vegetate disturbed areas, where feasible."

21 Could you describe to me why or when re-vegetating
22 would not be feasible?

23 A. Well, re-vegetating would not be feasible during the
24 wintertime. Is that what you mean?

25 Q. No. Because then you would re-vegetate during the

1 spring. Like during the wintertime -- you just say that
2 re-vegetation may not be feasible. Of course, that was
3 subject to landowner preferences. I just don't
4 understand when it would not be feasible to re-vegetate.

5 Were you only referring to winter and then it would
6 never be re-vegetated if that was winter?

7 A. So in looking at this sentence, I believe it says
8 seed mixes to re-vegetate disturbed areas where feasible
9 and pending landowner preferences.

10 So I would say that based on the landowner
11 preferences it may not be feasible.

12 Q. That would be the only time it would not be
13 feasible, in your opinion? Or that's what you're trying
14 to say there?

15 A. To my knowledge, yes.

16 Q. Okay. Is there any information that you are aware
17 of, current or historical, regarding river otters in
18 adjacent or near the Crowned Ridge Wind II project area?

19 A. So river otters are discussed in the Application,
20 and they are discussed in Section I believe 11.3, if
21 you'll allow me to get there.

22 Q. Uh-huh.

23 A. Section 11.3.1.3.1 discusses the Northern River
24 Otter. And on page 58 of the Application it notes that
25 the closest documented observation of the Northern River

1 Otter was along an unnamed tributary to Hidewood Creek
2 approximately 3.1 miles southeast of the project area.
3 And that information came from the South Dakota Natural
4 Heritage Database, and that database is managed by the
5 South Dakota Game, Fish & Parks.

6 Q. Thank you.

7 Did you make any visits personally to the project
8 site for any study?

9 A. I did not complete any studies, but I have been
10 through the project area.

11 Q. Okay. And then I believe it's your testimony, but I
12 didn't find it before we came back from lunch. Were you
13 the one that said you don't expect any issue with water
14 because the water is typically 100 feet below the
15 surface?

16 A. So the Application details to great extent water and
17 specifically groundwater issues. And all those
18 hydrologic resources are described in the Application.

19 Generally aquifers and other areas are 100 feet.

20 MS. CHRISTENSON: Okay. That's all the
21 questions I have. Thank you.

22 THE WITNESS: Thank you.

23 MS. CREMER: Mr. Robish.

24 MR. ROBISH: I have no questions.

25 MS. CREMER: Thank you.

1 Staff.

2 MS. REISS: Thank you. Just a few for you.

3 CROSS-EXAMINATION

4 BY MS. REISS:

5 Q. In your Rebuttal Testimony you provide testimony
6 that you do not agree with a proposed condition by Staff.
7 And that would be on page -- it's regarding whooping
8 crane conditions.

9 A. Yes.

10 Q. Does that ring a bell?

11 A. Yes.

12 Q. Does that -- can you just clarify? Do you not agree
13 with the proposed condition, or do you not agree that
14 there is a need for a condition to address whooping
15 cranes?

16 A. Crowned Ridge doesn't believe that there is a need
17 for the conditions because of the commitments already as
18 stated in the testimony and in the Application.
19 Specifically, that there has been a desktop habitat
20 assessment already conducted and also that there will be
21 training involved for operations personnel to the effect
22 that they would develop a process and a flowchart showing
23 how to train personnel to identify whooping cranes if
24 they are found during the operation and detected within
25 two miles of the operating turbine by those operating

1 staff.

2 So because of those commitments already stated in
3 the Application, Crowned Ridge does not believe that
4 condition is necessary.

5 Q. And that is still your position today?

6 A. Yes.

7 Q. Okay. And then I believe in response to some of
8 Ms. Christenson's questions you discussed Exhibit A1-B;
9 is that correct?

10 A. Which one is A1-B?

11 Q. Oh, it would be -- I can just point you to it, if
12 it's easier. If you want to point out A1-B, Application
13 Exhibit A1-B. And if you go to page 5 of 135 when you
14 get to that, that would be helpful.

15 A. What was the page number again?

16 Q. 5 of 135.

17 And are you looking at?

18 A. A1-B?

19 Q. A1-B.

20 A. The agency coordination?

21 Q. Yes. So you found page 5?

22 A. A letter from the Fish & Wildlife Service?

23 Q. Yes.

24 A. Okay.

25 Q. And did you review that document in preparation for

1 your testimony and to prepare for today?

2 A. I looked at lots of things, but if I could have a
3 minute to just refresh my memory.

4 Q. Sure.

5 (Witness examines document.)

6 A. And this is specifically the Fish & Wildlife Service
7 letter dated November 26, 2007?

8 Q. Yes.

9 A. Okay.

10 Q. And in that document did the U.S. Fish & Wildlife
11 Service identify that whooping cranes may occur in the
12 project area?

13 A. Yes. So on page 1 it says, "In accordance with
14 Section 7(c) of the Endangered Species Act, as amended,
15 we have determined the following federally listed species
16 may occur in the project area." And in that species list
17 is a whooping crane.

18 Q. Okay. And then could you turn to page 53 in that
19 same exhibit, please.

20 A. You might have to help me out. These are not --

21 Q. It's another letter.

22 A. Okay. Can you give me the date?

23 Q. February 5, 2010.

24 March 23. I apologize.

25 A. March 23, 2014?

1 Q. Yes.

2 A. From the United States Fish & Wildlife?

3 Q. Yes.

4 A. Okay. I'm there.

5 Q. And, once again, in that document did the U.S. Fish
6 & Wildlife Service identify that whooping cranes may
7 occur in the project area?

8 A. Yes. It is listed in the list of proposed species
9 that may occur in the project area.

10 Q. When this information was provided to Crowned
11 Ridge II what work was done to investigate the potential
12 impacts to whooping cranes in the project area?

13 A. Sure. So one of the studies that Crowned Ridge
14 undertook was a Whooping Crane Habitat Assessment Study,
15 and that is as part of the Application.

16 The Whooping Crane Habitat Assessment Study really
17 looked at available suitable habitat for whooping cranes.
18 And whooping cranes need a very specific wetland habitat.
19 So in this case for whooping cranes not all wetlands are
20 created equal. They need very specific habitat in which
21 to use for their stopover as they fly from Canada down to
22 the south.

23 And in looking at doing that study, Crowned Ridge
24 found that 0.2 percent of the wetlands in the project
25 area would provide suitable habitat for whooping cranes.

1 As I'm sure you'll agree, that's a very minute case of
2 potential suitable habitat where a whooping crane could
3 stop over.

4 I would also note that the whooping crane migratory
5 corridor is 50 miles outside of the project area. And,
6 as such, the majority of species that we will see will be
7 in that migratory corridor. 95 percent of the known
8 occurrences of whooping cranes will be in that migratory
9 corridor.

10 You may see a few stray and, of course, we have.
11 The last closest whooping crane to the project was from
12 1973, approximately 22, 23 miles from the project area.

13 Q. Thank you.

14 You mentioned the migratory corridor. Are you aware
15 of whether the whooping crane migration corridor has
16 changed over time?

17 A. So the whooping crane migratory corridor is not a
18 static thing.

19 As we know, birds shift; right? And they go down
20 potentially a migratory corridor, but things can impact
21 that corridor. We don't expect that that corridor would
22 remain static over time. It can shift, according to
23 different variables.

24 One of those variables is where is that stopover
25 habitat? What does the climate look like? What is

1 happening is we see agriculture and different things
2 happening. What happens if there's a drought?

3 So really we can see that that can change. And the
4 literature, including Pierce, et al., who is one of the
5 known experts for whooping cranes, has described that
6 migratory could shift.

7 One of the things that Crowned Ridge does in
8 coordination, as you've seen in the agency
9 correspondence, is there's been continual coordination
10 with the agencies, including the United States Fish &
11 Wildlife Service and the South Dakota Game, Fish & Parks,
12 and the most recent ask for the United States Fish &
13 Wildlife Service was done in December 2019 to see if
14 there were additionally any other whooping cranes that
15 were closer to the corridor, and at this time the closest
16 one is still the one that is 22 to 23 miles away from the
17 project area.

18 Q. Thank you.

19 And just going back to your Rebuttal Testimony, and
20 it's on testimony you provided today, you mentioned that
21 Crowned Ridge is taking steps regarding whooping cranes.
22 Can you describe the process Crowned Ridge Wind II plans
23 to implement regarding whooping cranes?

24 A. So there's a couple different things. One, the
25 Wildlife Conservation Strategy will be filed 30 days

1 prior to construction. And that Wildlife Conservation
2 Strategy will really describe, one, all the commitments
3 already made in the Application. And it will also
4 condense all those studies, including all the avian
5 studies, the raptor nest survey studies, the whooping
6 crane studies.

7 It will condense all of that and describe all the
8 commitments that are made moving forward, including the
9 training of staff to identify whooping cranes annually.
10 And it will also monitor potentially for any detections
11 during regular operations duties. And the submittal of
12 this approach will be done in coordination with the
13 South Dakota Game, Fish & Parks staff and as part of that
14 filing with the Commission.

15 Q. Thank you.

16 And is any part of this plan dependent or contingent
17 on an expansion of the migratory corridor for whooping
18 cranes?

19 A. Sorry. Can you rephrase your question?

20 Q. Uh-huh.

21 Okay. We can move on. I'm sorry.

22 In your review of this docket did you review the
23 proposed whooping crane condition proposed by Staff
24 Witness Darren Kearney in his Direct Testimony?

25 A. Yes.

1 Q. And isn't it Crowned Ridge II's plan for addressing
2 whooping cranes similar to the condition this witness
3 proposes?

4 A. I believe it's similar in nature. Again, as stated,
5 Crowned Ridge feels that it has already made this
6 commitment clear, that they will be going forward with
7 training operations staff. And so that was really the
8 only reason we said that condition was not necessary;
9 because that commitment has already been made in the
10 Application and the testimony.

11 Q. So, in your opinion, the condition that was proposed
12 doesn't include anything beyond the scope of what Crowned
13 Ridge II has already committed to?

14 A. It would be Crowned Ridge's commitment to say if
15 they believe there was any difference. But, again, they
16 feel they have already committed to this condition.

17 MS. REISS: No further questions.

18 Thank you.

19 MS. CREMER: Thank you.

20 That would take us to Commission questions. And
21 Commissioner Fiegen.

22 COMMISSIONER FIEGEN: I wasn't going to have any
23 questions, but I was certainly looking up whooping crane
24 everywhere and doing all sorts of searches while you were
25 testifying.

1 And, you know, that was certainly my question,
2 and I'm sure Commissioner Hanson will ask the same
3 question. You know, staff tries to be transparent and at
4 the Public Utilities Commission transparency is really,
5 really important to us.

6 I cannot understand why if you're committing to
7 it in the Application and the Staff has put it as a
8 condition and they're very similar, why -- help me
9 understand why transparency would not be important to you
10 like it is to the Public Utilities Commission.

11 And that's the whooping crane condition.

12 A. So, again, I'm a consultant for Crowned Ridge so I
13 can't make specific commitments. But, again, I will
14 state that Crowned Ridge feels that it has made this
15 commitment already in the Application.

16 Whether they commit to do that or not, if that is
17 done by Staff, then, of course, I believe Crowned Ridge
18 would work with Staff on that.

19 COMMISSIONER FIEGEN: No further.

20 MS. CREMER: Chairman Hanson.

21 CHAIRMAN HANSON: Good afternoon.

22 THE WITNESS: Good afternoon.

23 CHAIRMAN HANSON: Welcome back to South Dakota.

24 THE WITNESS: Thank you.

25 CHAIRMAN HANSON: I do have a couple questions

1 on whooping cranes.

2 COMMISSIONER FIEGEN: I knew you would.

3 CHAIRMAN HANSON: You're not saying that you've
4 adopted Mr. Kearney's suggestions completely, are you?

5 THE WITNESS: No. Again, just restating what
6 I've said, that we believe we've already made that
7 commitment.

8 CHAIRMAN HANSON: Well, they've made a
9 commitment.

10 Do you know the project duration, anticipated
11 duration of this project?

12 THE WITNESS: As far as duration of --

13 CHAIRMAN HANSON: How long this project is going
14 to be in South Dakota? What's the life of it?

15 THE WITNESS: I would have to refer back to the
16 Application.

17 CHAIRMAN HANSON: Would it surprise you or would
18 it seem logical that it's around 20, 25 years?

19 THE WITNESS: I believe that's what is stated in
20 the Application.

21 CHAIRMAN HANSON: And it could be extended
22 beyond that period of time?

23 THE WITNESS: Again, that would be up to Crowned
24 Ridge.

25 CHAIRMAN HANSON: It wouldn't surprise you,

1 though, would it?

2 THE WITNESS: It depends on the project.

3 CHAIRMAN HANSON: Okay. During that period of
4 time would you agree that there's a potential for change
5 in the migratory path?

6 THE WITNESS: Of course. Literature supports
7 that, you know, that migratory corridor is, again, not
8 static. It can change, according to variations in
9 different items.

10 CHAIRMAN HANSON: In your testimony you state
11 singular in your positions. You say the migratory path.
12 However, there are actually two migratory paths that --
13 actually you could say there's three if you include the
14 one that's potentially developing on the East Coast. You
15 could say that there were almost four because of the
16 attempts in Colorado to -- as I recall, to extend a
17 migratory path there; correct?

18 THE WITNESS: I wouldn't know exactly on that
19 one.

20 CHAIRMAN HANSON: Aren't you presenting yourself
21 as somewhat of an authority on whooping cranes and their
22 migration?

23 THE WITNESS: I am not an expert in whooping
24 cranes. My background is in archeology. However, I am
25 authorized to speak on the Application.

1 CHAIRMAN HANSON: Then would it surprise you
2 that besides the -- I believe it's the Arkansas in Texas,
3 migratory -- National Wildlife Refuge that they migrate
4 up into, well, northern Canada. And there's another one
5 that has been developed where they use the small aircraft
6 to guide them?

7 I didn't think I was going to have to go through
8 an explanation on this item.

9 THE WITNESS: I'm sorry.

10 CHAIRMAN HANSON: Or I would have read up on it.
11 To a place in Wisconsin. Are you familiar with that,
12 from Florida to Wisconsin?

13 THE WITNESS: No, I'm not.

14 CHAIRMAN HANSON: Okay. Interesting.

15 So are you aware of how many whooping cranes
16 there are in the only historically single migratory path
17 that you were referring to?

18 THE WITNESS: To the 95 percent corridor? Is
19 that what your --

20 CHAIRMAN HANSON: Well, how many whooping cranes
21 there are in that flock. I know it's not one single
22 flock that flies up but --

23 THE WITNESS: I'm not aware of the exact number,
24 but I think it was between 3 to 600.

25 CHAIRMAN HANSON: Are you aware of any other

1 of this species in the entire world except for
2 North America?

3 THE WITNESS: I would have no knowledge of that.

4 CHAIRMAN HANSON: Goodness. And yet you're
5 making recommendations on the -- on how they should be --
6 how we should look out for them?

7 THE WITNESS: So I supervise a staff that
8 includes biologists that have studied whooping cranes.
9 And in the preparation of the Application and
10 specifically in working with Crowned Ridge, our experts
11 feel that the conditions that are stated forth in the
12 Application and testimony are correct and that
13 commitments to protect whooping cranes have been stated
14 as such.

15 CHAIRMAN HANSON: Well, you're not instilling me
16 with confidence. As few of these -- I mean, once they're
17 gone, they're gone. I wish you could answer my questions
18 for me.

19 So you don't know how many there are or what
20 their migratory paths are or if they exist anywhere
21 outside of the United States, which they don't.

22 Do you know how wet it's been in South Dakota
23 over the past few years?

24 THE WITNESS: Yes, I do. I've lived in Bismarck
25 for over four years, and it's been wet up there too.

1 CHAIRMAN HANSON: Do you know that this changes
2 the habitat for avian species in addition to the whooping
3 crane?

4 THE WITNESS: Of course. I mean, any time you
5 have extreme periods of climate -- and this is true for
6 any species. You know, whether it's drought or flooding
7 or, you know, any other kind of natural disasters, of
8 course, that's going to change the ecosystems for
9 species.

10 CHAIRMAN HANSON: So could this potentially
11 change the migratory path?

12 THE WITNESS: As far as the flooding and the
13 wetness?

14 CHAIRMAN HANSON: Yes.

15 THE WITNESS: Potentially, of course. One of
16 the things to keep in mind, though, is knowing that
17 whooping cranes really need specific habitat so
18 additional wetness may not create more wetlands that are
19 suitable for that stopover habitat.

20 So it doesn't necessarily indicate that just
21 because the area is wet that those whooping cranes would
22 come over here because it's wetter. Again, they would
23 have to have those specific requirements for the habitat
24 as described in the habitat assessment in order to find
25 suitable stopover.

1 CHAIRMAN HANSON: And yet I'm sure you would
2 agree that the -- the more rain -- if this is the new
3 normal, that the more rain that other parts of the state
4 receive, that there is a likelihood of a creation of more
5 habitat for the whooping crane.

6 THE WITNESS: Potentially. Again, wetlands are,
7 again, not all created equal, and there are certain
8 requirements for wetlands, specifically looking at
9 vegetation type, soil type, those types of things in
10 order to look at a wetland.

11 And, again, not all of those wetlands would be
12 suitable for the habitat for whooping cranes. So, again,
13 you might find some that, yeah, maybe there's new
14 suitable habitat that's created. There might be suitable
15 habitat that's also destroyed by flooding. So I think
16 you could see both.

17 I think one of the things to, you know, keep in
18 mind, you know, and hopefully -- I might not know all the
19 answers for whooping cranes, but what I do know is
20 Crowned Ridge is continually coordinating with the
21 agencies. So in coordination with the United States
22 Fish & Wildlife Service and other experts that know
23 whooping cranes, one of the things that they will do is,
24 you know, if we are seeing that South Dakota's impacted
25 and suddenly there's new habitat areas and whooping

1 cranes are moving further to the east, Crowned Ridge will
2 know.

3 And as stated in the Wildlife Conservation
4 Strategy, that's one of the areas that could be looked at
5 as far as making sure that we're protecting these
6 species. Because they are. They're endangered, and
7 there are few of them. I know that much.

8 CHAIRMAN HANSON: I hear what you're saying. I
9 just don't receive the confidence from what is written
10 and the positions that Crowned Ridge is taking on this
11 issue. And the seemingly incredible resistance to even
12 the most minor of suggested changes to it.

13 Do you believe in climate change by any chance?

14 THE WITNESS: Of course.

15 CHAIRMAN HANSON: So if you believe in climate
16 change, then you should certainly believe in the fact
17 that additional migratory stopovers will exist in the
18 future. And if we have a 25-year project here that may
19 extend for I don't know how many years beyond as they
20 find additional generating facilities that would compete
21 in the energy industry, you know, you can't just plan for
22 this minute, for this day when we're looking at something
23 of this nature.

24 We've got to look beyond. We've got to look
25 beyond the three Commissioners here. We've got to look

1 beyond this year or the past two years.

2 So I would think that you would agree that
3 dismissing the suggestions from Mr. Kearney are
4 inconsistent with just intuition of what should be done
5 to protect a very, very rare species.

6 Would you agree?

7 THE WITNESS: As far as protection and keeping
8 the -- going with the condition that has been proposed?
9 Is that the question?

10 CHAIRMAN HANSON: I don't wish to repeat the
11 question, I guess.

12 COMMISSIONER FIEGEN: We're going to put you on
13 the witness stand.

14 THE WITNESS: Again, you know, what I can say is
15 that, you know, Crowned Ridge would have to make that
16 commitment. So, you know, Tyler, who I work for, would
17 need to make that commitment to staff.

18 CHAIRMAN HANSON: Tell me about this operations
19 staff then that all this great confidence is going to be
20 placed in for identifying whooping cranes.

21 Are you going to be educating them on all of the
22 different species of cranes that there are and -- gee, if
23 they're spotted -- I read through -- I'm sorry to trample
24 over my own question, but I just am a little bit beside
25 myself as I look at --

1 It's if the migratory corridor expands. That's
2 not very definitive. "If whooping cranes are detected
3 within two miles by trained operations staff." You know,
4 there's just a lot of ifs in here. And they will
5 informally monitor for any detections.

6 It's not like these are starlings or blackbirds
7 or whatever that are -- where there's millions of them.
8 The loss of one is pretty important. So where do I get
9 the confidence that I should not vote against the entire
10 project unless they are serious about taking care of a
11 very, very rare species?

12 THE WITNESS: I believe that Crowned Ridge is
13 serious about this species. And again as stated, you
14 know, they are going to train staff. So they are going
15 to go through biological resources, and I'm sure that
16 they would, you know, talk to those things.

17 But, again, you know, I can't make that
18 commitment for Crowned Ridge. If you'd like me to go and
19 ask Crowned Ridge, I'd be happy to do that. Again, I'm
20 just a consultant here so --

21 CHAIRMAN HANSON: Understood. Understood. But
22 you're their expert witness on it, and I'm not getting
23 there.

24 Thank you.

25 THE WITNESS: I apologize.

1 MS. CREMER: Redirect?

2 MR. SCHUMACHER: No redirect.

3 MS. CREMER: Thank you, Ms. Sappington. You are
4 excused.

5 THE WITNESS: Thank you.

6 (The witness is excused.)

7 (Discussion off the record.)

8 MS. CREMER: Crowned Ridge.

9 MR. MURPHY: Thank you. Before we rest the
10 case, I would like to -- and, Chair Hanson, on behalf of
11 Crowned Ridge, we will commit to the commitment in staff
12 Kearney's testimony on whooping cranes. I want to make
13 that commitment on behalf of the company.

14 MS. CREMER: You were just asking the wrong
15 person.

16 MR. MURPHY: The will of the Commission was, you
17 know, clearly expressed, and I appreciate your expression
18 so that we can be clear.

19 CHAIRMAN HANSON: I've got a couple other
20 requests but --

21 MR. MURPHY: I can't guarantee, you know --

22 CHAIRMAN HANSON: Well, thank you very much,
23 Mr. Murphy. I appreciate that, and I'm sure the whooping
24 cranes do too.

25 MR. MURPHY: With that, we rest our direct case.

1 MS. CREMER: Maybe.

2 MR. MURPHY: Okay.

3 MS. CREMER: Will you be calling Mr. Wilhelm in
4 rebuttal?

5 And the reason I ask is there's a question, and
6 I don't care when it comes in but --

7 MR. MURPHY: I would prefer to call him now if
8 there's a question from the Commission because -- in
9 Crowned Ridge I, for example, we didn't put on a rebuttal
10 case. And we may not here.

11 MS. CREMER: Okay. So, Mr. Wilhelm.

12 You are still under oath for the duration of the
13 hearing. Thank you.

14 COMMISSIONER NELSON: Mr. Wilhelm, thanks for
15 coming back. In the discussions we had with Mr. MaRous
16 yesterday, and you heard those discussions, we got off
17 onto this issue of aerial application, and Mr. MaRous was
18 telling us that wind farms would, in coordination with
19 aerial applicators, shut down in order for the
20 application to occur.

21 Now my -- I guess I would say two things. I was
22 surprised that he would be in a position to make that
23 kind of commitment, especially since this project is
24 going to be sold to Xcel. And so can you tell me, is
25 there some understanding that Xcel would operate in that

1 fashion and make that commitment to farmers and aerial
2 applicators?

3 THE WITNESS: The question hasn't been raised
4 from any of the local aerial application sprayers.
5 There's been no raised concerns as to whether that may
6 impact their current operations. When there is those
7 questions asked, you know, we would approach Xcel -- or
8 sorry -- Northern States Power and see if they would be
9 willing to do such.

10 We haven't talked about it. I would assume with
11 the amount of wind farms that they do operate, that they
12 have handled such situations of the like and coordinated
13 with those local spraying companies. And I wouldn't
14 assume that they would do any different from this
15 project.

16 COMMISSIONER NELSON: Okay. So then let's make
17 it real. For Crowned Ridge I when NextEra is operating
18 that project, is that your policy that you would be
19 willing to shut down turbines in order to coordinate with
20 aerial applicators?

21 THE WITNESS: Absolutely. We would coordinate
22 as necessary to make sure that those current operations
23 aren't impacted and put together a schedule with our O&M
24 team and work openhandedly.

25 COMMISSIONER NELSON: Excellent.

1 MS. CREMER: Is there any redirect to that?

2 MR. MURPHY: No.

3 MS. CREMER: All right. Then you are excused.
4 Thank you very much.

5 THE WITNESS: Thank you.

6 (The witness is excused.)

7 MS. CREMER: And you have rested. Is that my
8 understanding?

9 MR. MURPHY: Correct.

10 (Discussion off the record.)

11 MS. CREMER: Let's take just five minutes to get
12 everybody set up, and we will begin with Mr. Swanson.

13 (A short recess is taken.)

14 MS. CREMER: I will call the hearing back to
15 order. And at this time I think we will address the
16 Motion to Strike that was filed by the Applicant.

17 MR. SCHUMACHER: Thank you.

18 As stated in our motion, there are two grounds
19 upon which we have sought to strike the language
20 specified in the motion.

21 The first is that the prefiled testimony on
22 behalf of certain of the Intervenor contains what
23 appears to us to clearly be legal argument. Under our
24 Rules of Evidence a lay witness cannot offer what
25 constitutes expert testimony. Legal opinion is not lay

1 fact testimony, which is what should be contained in
2 affidavits and other forms of testimony.

3 The other ground is that when you see the words
4 "having been so advised by my attorney" or "my attorney
5 told me" that's a pretty good clue that what is going to
6 follow is hearsay. And, again, under the Rules of
7 Evidence that is not admissible testimony.

8 And on those grounds we feel the portions again
9 identified in our motion should be stricken from the
10 affidavits or prefiled testimony of these individuals.

11 MS. CREMER: Thank you.

12 Mr. Swanson, do you have a response?

13 MR. SWANSON: Well, the fact that the
14 affidavits, which I prepared with the assistance of the
15 witness, due to some minor extent quote me as their
16 counsel and is now being objected to as hearsay is an
17 interesting thought.

18 It's not being offered for the truth of the
19 matter. It is being offered as an explanation of why the
20 witness is doing what he's doing and why he is testifying
21 as to these particular facts because he has formed an
22 opinion that the counsel provided by his attorney is
23 reliable.

24 Now be that as it may, you might say or claim to
25 the contrary, never trust an old Swedish lawyer, and I'll

1 accept that. But this exhibit, these affidavits, are
2 here to communicate, communicate thoughts, not about wind
3 farms in general or anything on a broad, global sense.

4 It's here to communicate thoughts about a
5 subject matter which each of these persons is perfectly
6 entitled to express an opinion about. And that is the
7 state, the condition, the threats, and the value of their
8 respective parcels of real property.

9 They are owners. They are of adult age. They
10 are able to observe the threats that come to the value,
11 perceived value of their property, and that's what they
12 are relating to.

13 Now, that said, if the Commission wishes to
14 strike this, you're simply going to see this same
15 language over and over again in my upcoming briefs. So
16 why this would be so offensive, I'm not sure.

17 I have agreed to say that these witnesses -- in
18 further discussions with my brother Schumacher, that
19 these witnesses are not offering these statements as
20 legal opinions. Clearly they are quoting me and my
21 beliefs about legal theory and legal matters to some
22 minor extent. But these things all relate to their use,
23 ownership, and possession of their real property.

24 They relate also to their legal rights as
25 American citizens and citizens of this state. This is

1 really in no sense larger than what would be the case if
2 one of these witnesses were to say I enjoy First
3 Amendment rights as an American citizen or a right to
4 keep and bear arms under the Second Amendment and have
5 that show up as, well, that's testimony of a legal
6 nature, and if your lawyer told you that, you're not
7 permitted to say that.

8 All of us as citizens are entitled to repeat
9 what we believe to be the case about our personal rights
10 and in this case matters that pertain to the value of our
11 property.

12 I know that the PUC counsel has -- or Staff
13 counsel has taken a slightly less sweeping view of the
14 things that are to be struck. In the Ehlebracht
15 Affidavit, it's the second -- as I understand it, and
16 they can correct me if I incorrectly copied this.

17 One of the sentences that both Crowned Ridge and
18 Staff counsel wishes to strike is this. And this is at
19 lines 24 and 25 of page 4 of the Ehlebracht exhibit:
20 "Neither agency," and that's referring to both this
21 Commission and the Deuel County Board of Adjustment, "has
22 any real authority to approve or permit this adverse
23 use," and we're speaking now of the effects, "as to the
24 property of a nonparticipant."

25 Now that is slightly overbroad. I will agree.

1 We're speaking of them as nonparticipants. So I'm saying
2 this is a challenge by Ehlebracht as to his property as a
3 nonparticipant in this project.

4 He didn't ask to be included in the boundaries
5 of Crowned Ridge Wind farm. He understands that Crowned
6 Ridge Wind farm will be constructed. He continues to
7 disagree, but they have a right to cast effects on it.
8 That's about all I think I want to say.

9 And I think the motion extends also to Greber.
10 Am I correct?

11 MR. SCHUMACHER: Yes.

12 MR. SWANSON: And I don't know that I have
13 anything special to say about Greber. It's much the same
14 as with Ehlebracht.

15 Before I close my comments, Miles tells me that
16 we've resolved the Greber Affidavit and the Kranz
17 Affidavit at the outset of the discussion of this case on
18 Tuesday, that they were going to waive cross on those two
19 exhibits. And I think that's I-4 for Ms. Kranz and I-5
20 for Mr. Greber, subject only to the Motion to Strike on
21 Greber.

22 I will just note again Kranz is medically unable
23 to be here. And Greber is on a ship somewhere in the
24 Philippine sea.

25 MS. CREMER: All right. Thank you.

1 And, Ms. Christenson and Mr. Robish, you didn't
2 file anything in response.

3 So Staff.

4 MS. EDWARDS: Thank you. Kristen Edwards for
5 Staff.

6 We did file a partial joinder of this Motion to
7 Strike. I agree with the Applicant that 1-26 mandates
8 that we follow the Rules of Civil Procedure, that is with
9 one caveat, and that's that in 1-26-19 the Commission is
10 allowed to rely on evidence not otherwise admissible
11 thereunder or under the Rules of Civil Procedure may be
12 admitted except where precluded by statute if it's
13 commonly relied upon and so on and so forth. So that
14 gives us a bit of latitude.

15 And I did rely on that because while we never
16 play fast and loose with the Rules of Civil Procedure, we
17 do play fair. And some of it was fair game, and I do
18 agree with Mr. Swanson to that extent. We took a
19 slightly narrower view of that.

20 But some of it simply is hearsay. And like
21 Mr. Schumacher said, if you're saying my attorney told
22 me, if it's his intent to testify, if it's the attorney's
23 intent to testify, we have a whole nother set of problems
24 so I don't wish to go there. But to that extent we rely
25 on our filed joinder and only to those portions listed

1 therein.

2 Thank you.

3 MS. CREMER: And that would come back to you,
4 Mr. Schumacher. Do you have any response to anything?

5 MR. SCHUMACHER: Thank you. Just very briefly.

6 First on our agreement or stipulation, we did
7 agree that we will waive cross-examination on the
8 witnesses that are not available today except to the
9 extent of the subject matter of our motion.

10 I will agree with part of what Mr. Swanson
11 argued in his response, and that is that -- his comment
12 that he's going to put it in the brief, and that's really
13 where the legal arguments belong is in the brief and not
14 in the Affidavit.

15 MS. CREMER: And I believe there were Commission
16 questions. So yes.

17 COMMISSIONER NELSON: Thank you. And this is
18 going to be directed at Staff.

19 I did much the same exercise you did and,
20 frankly, came up with very nearly the same answers that
21 you did, with a few exceptions. And so I want to ask you
22 about those.

23 In looking at the Greber on page 4, you and I
24 were in agreement that lines 6 and 7 should not be
25 permitted. But it looks to me like the rest of that

1 sentence is hearsay. It's what the counsel told them.

2 And so why would you not remove that hearsay
3 portion, meaning lines 8 through the first part of line
4 11?

5 MS. EDWARDS: Looking at that now, you are
6 correct. I would remove that as well.

7 COMMISSIONER NELSON: Thank you.

8 Going to page 5 of the Greber Affidavit, that
9 first full sentence which would start at the end of
10 line 1 and end on line 3, it seems to me that that is a
11 legal conclusion.

12 MR. SWANSON: Where are you, Commissioner?

13 COMMISSIONER NELSON: Page 5 of the Greber,
14 lines 1 through 3, the full sentence that begins on
15 line 1 and goes through line 3.

16 MR. SWANSON: I didn't think that was subject to
17 a motion, but perhaps I'm wrong.

18 MS. EDWARDS: That was a portion of the
19 Applicant's original motion. I wrestled with that, and
20 it was a stretch to allow it in, I thought, because this
21 seems -- sort of couches it as this is my opinion, but I
22 leaned toward it being stricken.

23 COMMISSIONER NELSON: Thank you.

24 And so then the very last difference that I will
25 ask about is on the Ehlebracht on page 4, lines 14 and

1 15. And you've pulled out a phrase, and this would be
2 the same thing that I said on the first one.

3 It looks like all the rest of that sentence is
4 what the counsel told him. And so would that not be
5 hearsay?

6 MS. EDWARDS: I had requested "having been so
7 advised by my counsel" so that it would just read, "It is
8 my belief that" and go on. And as long as they were
9 willing to stipulate that he's not a lawyer, I felt that
10 that adequately couched the sentence.

11 COMMISSIONER NELSON: Okay. I can understand
12 that. But if we pull out that phrase, Mr. Ehlebracht
13 doesn't have the opportunity to reassess that and tell us
14 whether that is a true statement or not because we have
15 changed the meaning of the statement by pulling out
16 "having been so advised by counsel."

17 MS. EDWARDS: He's testifying so I guess as a
18 party I would feel comfortable that I could ask him on
19 cross.

20 COMMISSIONER NELSON: Okay. Thank you. That's
21 all the questions I've got.

22 MS. CREMER: Commissioner Fiegen, did you have
23 any questions?

24 Chairman Hanson?

25 CHAIRMAN HANSON: No, thank you.

1 MS. CREMER: Do you have a motion in mind?
2 Commissioner Nelson, do you need a minute?

3 COMMISSIONER NELSON: No. I think I can --

4 MS. CREMER: Okay.

5 COMMISSIONER NELSON: And, all, please forgive
6 me if this isn't as coherent as it needs to be, but I
7 would grant the Motion to Exclude as provided in the
8 Staff's joinder motion.

9 However, I would also include from the Greber
10 Affidavit page 4, lines 8 through the end of the sentence
11 on line 11, and on page 5, line 1 through 3, the full
12 sentence, starting with, "This seemed." And I'd be happy
13 to answer questions if that's not clear.

14 So the sum total is we are leaving in a
15 significant portion that Crowned Ridge had asked to be
16 removed with some, I think, pretty very narrow areas that
17 are clearly hearsay or legal conclusion.

18 MR. SWANSON: Again, if I may be heard on that,
19 I'm not offering the statement for the truth of it. He
20 has told you where he -- because he's not a trained
21 lawyer. He is advising the Commission the grounds why he
22 is here as it relates to his property and the concerns
23 that he has.

24 And if the Commission doesn't want to hear about
25 the future of these property owners and their rights to

1 enforce legal rights under nuisance law because this wind
2 farm will exist by virtue of statute and an operating
3 permit and a Conditional Use Permit in three counties,
4 whether that can be challenged.

5 For example, if -- let's just assume, if I may
6 be heard on this, that you authorize 45 dBA for noise and
7 it's well documented that somewhere up to 45 dBA is an
8 absolute onerous task for a property owner and they
9 decide to challenge this on the basis of nuisance,
10 nuisance law under Chapter 22-10. I'm not sure they'd be
11 able to do that judicially because once it's been
12 authorized by a statutory process --

13 There's a wonderful case from Magistrate
14 Judge Simko in Sioux Falls. Somebody challenged the
15 grain elevator, the way it was functioning in Parker,
16 South Dakota, creating dust and mold and so forth, and
17 they sued to enjoin the continued operation as a
18 nuisance. And Judge Simko said grain elevators exist by
19 virtue of statute, and you can't shut it down.

20 Now if that's what your intention is, is to
21 disarm property owners from challenging the future of
22 this wind farm operation, and if that's your intention,
23 well, that's fine, but that's more evidence that you're
24 disarming property owners and their legal rights. And
25 why you would not want to be fully informed of that,

1 well, that escapes me.

2 And I appreciate the fact that we're all
3 concerned about whooping cranes. I applaud you for going
4 to bat for whooping cranes. We're the only people that
5 go to bat for these property owners around Goodwin. And
6 we're pleading with you, much like a whooping crane, that
7 you should listen to our concerns.

8 Thank you.

9 MS. CREMER: Okay. So I just want to say that
10 really wasn't your turn to speak because we were --

11 MR. SWANSON: Sorry. Sorry.

12 MS. CREMER: And so, Crowned Ridge, I'm not
13 going to let you speak to it unless I'm told otherwise.

14 But, Commissioner Nelson.

15 COMMISSIONER NELSON: So I guess my question for
16 Mr. Swanson, if the motion that I've made passes, how in
17 any way does that prevent you or your clients from
18 bringing the type of nuisance suit that you just
19 described?

20 MR. SWANSON: It doesn't. I'm just simply
21 trying to be informative.

22 COMMISSIONER NELSON: Thank you.

23 MS. CREMER: So, with that, there is a motion by
24 Commissioner Nelson. So I will just run through the
25 vote. Commissioner Fiegen -- or did you want to discuss

1 your motion?

2 CHAIRMAN HANSON: Yeah. I -- I'd just like to
3 say in listening to Mr. Swanson's soliloquy, I -- I mean,
4 you had me. If it doesn't affect -- do I understand that
5 correctly? The vote on this will not change their
6 ability to --

7 MR. SWANSON: No. No. And I didn't mean to
8 imply that. All I'm trying to do is be informative with
9 the testimony.

10 CHAIRMAN HANSON: Okay. It just sounded like we
11 were taking away their right to pursue those avenues.

12 MR. SWANSON: Potentially you do with a final
13 permit.

14 CHAIRMAN HANSON: Okay. Thank you.

15 MS. CREMER: Did you want to discuss your motion
16 at all?

17 COMMISSIONER NELSON: I don't think so. I mean,
18 my statements would be exactly the same thing that Staff
19 had in their brief. We just came to a little bit
20 different conclusion.

21 MS. CREMER: Okay. So, with that, there is a
22 motion in front of the Commission.

23 Commissioner Fiegen.

24 COMMISSIONER FIEGEN: Fiegen votes aye.

25 MS. CREMER: Chairman Hanson.

1 CHAIRMAN HANSON: Aye.

2 MS. CREMER: And Commissioner Nelson.

3 COMMISSIONER NELSON: Aye.

4 MS. CREMER: So that motion passes 3-0.

5 So the Motion to Strike, everyone should
6 understand what's in and what's out, I believe. If you
7 don't, when we come up to it, you can ask. Which will
8 bring us to Mr. Swanson's direct case.

9 MR. SWANSON: Do we wish to have those exhibits
10 redacted accordingly at this time, or how do you wish to
11 proceed?

12 MS. CREMER: You can resubmit them at a later --
13 you don't need to do it now. Is that what you're asking?

14 MR. SWANSON: Well, I guess if a Motion to
15 Strike has been granted, I would feel a little weird
16 about offering exhibits that are unredacted because I --

17 MS. CREMER: You can late file them. Would
18 that -- I just don't want you to have to stop everything
19 now to do anything about it. Or what is your -- what
20 would you like to do?

21 MR. SWANSON: Well, I think Commissioner Nelson
22 has included in the motion that has passed items that are
23 actually beyond PUC Staff's and even beyond the motion of
24 Crowned Ridge if I'm not mistaken.

25 COMMISSIONER NELSON: No.

1 MS. CREMER: I don't think so.

2 MR. SWANSON: So, I mean, I outlined what was
3 within Miles's motion and then what was reduced by Staff,
4 and I guess I'm not -- I'm no longer trusting of my own
5 handwriting here to see what --

6 MS. CREMER: I guess if you trip over something,
7 we'll bring it up to you.

8 MR. SWANSON: Well, hopefully the record --
9 hopefully we have a good court reporter that will --

10 MS. CREMER: We count on her entirely.

11 CHAIRMAN HANSON: I would like to see within the
12 time frame of this hearing a clean copy.

13 MR. SWANSON: I don't have any ability to do
14 that.

15 MS. EDWARDS: I can put one together, circulate
16 it amongst the lawyers to see if you all agree on it, and
17 file it tonight if we all do.

18 CHAIRMAN HANSON: Thank you very much.

19 MS. CREMER: So are you -- are you prepared
20 then, Mr. Swanson, to call a witness?

21 MR. SWANSON: Call Garry Ehlebracht.

22 (The oath is administered by the court reporter.)

23 DIRECT EXAMINATION

24 BY MR. SWANSON:

25 Q. Would you state and spell your last name for the

1 record.

2 A. Garry, G-A-R-R-Y, Ehlebracht, E-H-L-E-B-R-A-C-H-T.

3 Q. And what is your address?

4 A. 17539 468th Avenue, Goodwin, South Dakota.

5 Q. And by whom are you employed, Garry?

6 A. Self-employed. Self-employed and by the United
7 States Postal Service.

8 Q. At Goodwin?

9 A. In Goodwin. I'm a PMR so I can move around to other
10 post stations as needed.

11 Q. Are you a native of the Goodwin area?

12 A. Since '99.

13 Q. Now, Garry, you were here during the discussion that
14 we've had on the Motion to Strike, which has been
15 approved. And I'm sorry. The exhibit that's in front of
16 you to your right does not have those items marked so I
17 want you to bear that in mind.

18 In addition to the Motion to Strike, which reduces
19 the content of the exhibit to some extent, let me focus
20 your question or your attention on Exhibit I-1. And I
21 have this question for you.

22 In connection with your appearance here today, have
23 you caused to be prepared a document which has been
24 marked Exhibit I-1, which would contain the bulk of your
25 Direct Testimony that you wish to offer at this time?

1 A. Yes.

2 Q. And is that document I-1?

3 A. Yes.

4 Q. And you understand that a Motion to Strike has been
5 granted to certain parts of it on page 3 and page 4?

6 A. Yes.

7 Q. Are there any other changes or additions that you
8 would wish to make to Exhibit I-1?

9 A. No.

10 Q. Now in your exhibit you do -- or in your Affidavit
11 you do mention at some point on page 3 that you are
12 familiar with a certain Crowned Ridge document that had
13 been handed to your neighbor, Laretta Kranz?

14 A. Yes.

15 Q. Can you relate just a little bit more about the
16 circumstances of how Ms. Kranz sought out your advice or
17 counsel?

18 A. Laretta called me and said that this Adam
19 McDonaldson [sic] contacted her about a wind farm lease.
20 She said she would meet with him at Godfather's Pizza.
21 At that point he gave her this document, which she gave
22 to me.

23 Q. Is that the document that's been marked Exhibit I-2?

24 A. Yes.

25 Q. And what year was this that Ms. Kranz talked to you

1 about this document?

2 A. It had to have been the later part of '16, early
3 part of '17.

4 Q. And have you had this document in your possession
5 since then?

6 A. Yes.

7 Q. Did you ever hear from Mr. Adam McDonald?

8 A. Yes. He called me at my place of business and
9 introduced himself as Adam McDonaldson, land agent for
10 Crowned Ridge. He asked my thoughts on the project, the
11 wind farm.

12 I mentioned to him that I thought that they were
13 placing the turbines too close to property. At that time
14 he laughed at me. And I said our conversation is done.

15 Q. All right.

16 A. I didn't appreciate it.

17 Q. Did you have any subsequent conversation with
18 Ms. Kranz about I-2?

19 A. Laretta and I have been talking about the wind farm
20 since that date.

21 Q. All right. Are you the person who told me about
22 Ms. Kranz's medical condition at the current time?

23 A. Yes.

24 Q. She's unable to travel to Pierre?

25 A. Yes.

1 Q. Directing your attention to I-3, is this the
2 document that you asked me to prepare on your behalf and
3 your neighbor's behalf for intervention in this
4 Application?

5 A. Yes.

6 Q. Does this document state certain additional facts
7 about your property or the property of other Intervenors
8 in this case?

9 A. Yes.

10 Q. And is it your wish that the Commission consider the
11 contents of both Exhibit I-2, I-3 -- I'm sorry. I-1,
12 I-2, and I-3?

13 A. Yes.

14 Q. Is there anything else you wish to add to your
15 statement?

16 A. Well, you know, I don't -- I guess I don't
17 appreciate what they're doing. Whether that means
18 anything or not. I don't know why they seem to be --
19 think they can take from me what I've boughten or am
20 paying for.

21 I work hard for what I've got. They want to throw a
22 turbine up, what this says is 2,211 feet under the
23 100 megawatt array. Under the 200 megawatt array it's
24 3,900 some feet. But I'm sure as what I've seen these
25 last couple days, trying to get straight answers is

1 almost impossible. And they're going to move right in.

2 And they sell this project to Northern States Power,
3 they're not going to care. They're not going to care
4 about the whooping cranes. They're not going to care
5 about shadow flicker. They're not going to care about
6 shadow.

7 There's more shadow than shadow flicker on my
8 property because where 36 is, which is 2,211 feet away, I
9 got a tree belt to the north and to the west, which most
10 in South Dakota do. Because that's the way it is. You
11 have nothing on the east side.

12 So turbines that are straight east of Laretta and I,
13 trust me, you can look out in the morning, and where
14 those turbines are going to be, it's right in line with
15 our property. Guarantee it. You don't believe me, get
16 out there and see it. It's true.

17 You know, I shouldn't -- you know, the property
18 rights are mine. I probably can't say it, but it's my
19 right, my property. It's not for sale. It's not for the
20 taking. I wish you'd listen to that.

21 MR. SWANSON: Thank you.

22 I offer the witness.

23 MS. CREMER: Thank you.

24 Crowned Ridge.

25 MR. SCHUMACHER: No cross. Thank you.

1 MS. CREMER: Ms. Christenson.

2 CROSS-EXAMINATION

3 BY MS. CHRISTENSON:

4 Q. Since you purchased your property in 1999 have you
5 made any improvements to your property?

6 A. Yes. Re-insulated the whole house, new windows, put
7 the shed on. Put a 42-by-75 Morton building on. Got a
8 little man cave in there. Got a hoist in there. Got
9 heat, insulation. I also have OR Machining & Repair that
10 I do out of that building. New tin roof, cedar siding on
11 the house. Trees, multiple trees. Evergreens.

12 Q. Thank you.

13 So your house, the way it's situated, you talk about
14 not having trees to the east. Would your main living
15 area be -- the windows, would that be facing those
16 turbines that would cause the most flicker?

17 A. Yes.

18 MR. SCHUMACHER: Excuse me. I'm going to object
19 to what I would term as friendly cross here. I think
20 that we need to be a little careful about leading
21 questions in this context.

22 MS. CREMER: And I would just remind everyone --
23 and we've had this come up in our prior hearings. The
24 standard that the Supreme Court has said is the purpose
25 of cross-examination is to test the truth of direct

1 testimony. And so we have limited it to that in the
2 past, and we will do so today.

3 So if there's something about -- that he said on
4 direct examination that you found to be less than
5 credible or that needs to be tested, you can ask a
6 question. But you cannot do friendly cross-examination.

7 MS. CHRISTENSON: So I did ask about the turbine
8 flicker into his windows. Is that friendly
9 cross-examination? Because he talked about not -- his
10 view.

11 MS. CREMER: It really is. His attorney could
12 have asked all those questions on direct. He did not or
13 they chose not to because it's in his Affidavit. You
14 cannot now ask him to supplement his case.

15 MS. CHRISTENSON: I see. Okay. Thank you very
16 much.

17 That's all, Garry, for me. Thank you.

18 THE WITNESS: Thanks.

19 MS. CREMER: Mr. Robish.

20 MR. ROBISH: I have no questions for Garry.

21 MS. CREMER: Thank you.

22 Staff.

23 CROSS-EXAMINATION

24 BY MS. EDWARDS:

25 Q. Just one. Can you just point out kind of where you

1 live on that map?

2 A. There's a little white square right there
3 (indicating). Whoops. I'm sorry.

4 Right there above Bemis, one half-mile to the north
5 there's a small white square. Ms. Laretta Kranz lives
6 right there. She's got a half-mile square. So that's
7 where I am right there. So 36 is right there. 32 and 29
8 is another problem (indicating).

9 MS. EDWARDS: Thank you. No further questions.

10 THE WITNESS: Yep. Thanks.

11 MS. CREMER: Chair Hanson.

12 CHAIRMAN HANSON: I'm still contemplating
13 whether I have a question or not as I'm reading through
14 this.

15 Thank you for your testimony so far. I may have
16 one at the end here.

17 MS. CREMER: Commissioner Nelson.

18 COMMISSIONER NELSON: I have no questions.
19 Thank you.

20 MS. CREMER: Thank you Fiegen.

21 COMMISSIONER FIEGEN: Thank you. And, you know,
22 thank you for coming. This process is not easy. And
23 even the legal part is hard for a lot of us. So hang
24 with me when I ask you this question.

25 You know, when you got up and your -- A.J.

1 Swanson was asking you questions. And I wrote a note
2 down quick. And, you know, my shorthand is a little
3 short sometimes. So I miss it, so I always have to
4 sometimes ask Cheri.

5 You talked about not appreciating and then you
6 said something like they have taken from me what I paid
7 for I think was your statement.

8 THE WITNESS: Yeah.

9 COMMISSIONER FIEGEN: Paid for, are you talking
10 about the land that you paid for or some air rights?

11 THE WITNESS: My land.

12 COMMISSIONER FIEGEN: Okay. Your land.

13 THE WITNESS: Yeah.

14 COMMISSIONER FIEGEN: Thank you.

15 CHAIRMAN HANSON: I'm struggling to -- I
16 understand -- see if I can phrase the question without
17 trespassing.

18 COMMISSIONER FIEGEN: You trespasser. I'm going
19 to call him that from now on.

20 CHAIRMAN HANSON: I understand that you were
21 perturbed with someone, in your testimony. You hung up
22 on them.

23 Were you -- stop me if I do -- if I go beyond
24 this. But your statement is then government should be
25 prepared to pay for it if government plans to take

1 something from me.

2 Were you offered a lease opportunity or did
3 you --

4 THE WITNESS: Never talked to at all. Ever.

5 CHAIRMAN HANSON: Do you think you --

6 THE WITNESS: By anybody from Crowned Ridge.

7 CHAIRMAN HANSON: Do you think you may have shut
8 the door when you said don't call me again or --

9 THE WITNESS: He's seen me at Commissioner
10 meetings that he was at that I was at. I've been to
11 every one of the Board of Adjustment meetings, all the
12 late night meetings.

13 You know, I was assaulted by a Commissioner at a
14 meeting. And that's on file, but nothing's ever been
15 done by the State's attorney or the sheriff. Never been
16 done.

17 CHAIRMAN HANSON: Okay. That's beyond our
18 scope.

19 THE WITNESS: I realize that.

20 CHAIRMAN HANSON: Well, as Commissioner Fiegen
21 said, we really appreciate the challenges you're having
22 in going through this process and you coming all the way
23 out here to chat with us.

24 I'm sure all three of us have empathy with you
25 and want to follow the law here and do the best we can.

1 But thank you very much.

2 MS. CREMER: Mr. Swanson --

3 Oh, I'm sorry. Commissioner Nelson.

4 COMMISSIONER NELSON: I've been pondering kind
5 of a philosophical question throughout all of this. And,
6 frankly, I'd love to ask Mr. Swanson these questions, but
7 I'm not going to get that chance. So I'm going to ask
8 you, and if we can find an answer, great, and if we
9 can't, that's fine.

10 So in responding to Commissioner Fiegen, you
11 indicated that your property had been taken.

12 THE WITNESS: Yes, sir.

13 COMMISSIONER NELSON: Your physical property has
14 been taken? Explain to me what has been taken or what
15 will be taken.

16 THE WITNESS: It will be taken by the effects
17 that the Applicant, what do you want to say, puts on a
18 participant by the means of -- I could read it.

19 "Audio, visual, view, light, flicker, noise,
20 shadow, vibration, air turbulence, wake, electromagnetic,
21 electrical and radiofrequency interference, and any other
22 effects attributable to the wind farm or activity located
23 on the owner's property or on or adjacent property over
24 and across owner's property effect easement."

25 COMMISSIONER NELSON: And so as it relates to

1 any of those things, is there a level of those effects
2 that you would not consider a taking of your property, or
3 is a de minimis amount of any of those something you'd
4 consider a taking of your property?

5 THE WITNESS: Honestly?

6 COMMISSIONER NELSON: Yes. Please.

7 THE WITNESS: It's going to be every one of
8 them. Every one of them is going to affect me.

9 COMMISSIONER NELSON: No matter how small the
10 amount. Is that what I'm understanding?

11 Or is there a small amount that you wouldn't
12 consider to be a taking of your property?

13 THE WITNESS: Honestly, no. They're going to
14 take it all from me.

15 COMMISSIONER NELSON: So then let me transition
16 this to maybe a different context.

17 How far do you live from Ms. Kranz's house?

18 THE WITNESS: 1,000 yards.

19 COMMISSIONER NELSON: Okay.

20 THE WITNESS: She's my neighbor.

21 COMMISSIONER NELSON: And I take it she must be
22 elderly.

23 THE WITNESS: Yeah.

24 COMMISSIONER NELSON: Does she have
25 grandchildren?

1 THE WITNESS: Yes, she does. She's lost one
2 grandchild.

3 COMMISSIONER NELSON: Okay. So I'm going to
4 piggyback off something Mr. Swanson said this morning.
5 So it's the Fourth of July. I've been to Kranzburg on
6 the Fourth of July. Love Kranzburg on the Fourth of
7 July.

8 COMMISSIONER FIEGEN: You do?

9 COMMISSIONER NELSON: A parade, you bet I do.

10 THE WITNESS: I don't go.

11 COMMISSIONER NELSON: And so Mrs. Kranz's
12 children or grandchildren are shooting fireworks on the
13 Fourth of July.

14 THE WITNESS: Okay.

15 COMMISSIONER NELSON: You can see them. You can
16 hear them.

17 THE WITNESS: Yeah.

18 COMMISSIONER NELSON: Is that type of thing a
19 taking of your property?

20 THE WITNESS: It's not 24-7.

21 COMMISSIONER NELSON: Okay. And so that in your
22 mind is the difference.

23 THE WITNESS: It's every day every minute all
24 day all year for what did Mr. Hanson say? 25 years?

25 COMMISSIONER NELSON: Okay.

1 THE WITNESS: I don't know how it can be
2 allowed. They know it (indicating).

3 COMMISSIONER NELSON: Okay. And I appreciate
4 your having that discussion because that's what I'm
5 trying to wrap my mind around.

6 And, obviously, at the end of the day we three
7 have to take all of that against the statutory criteria
8 and figure out where all of that falls. But I wanted to
9 understand what you're thinking. So thank you.

10 THE WITNESS: And, again, I can't speak for
11 Steven because he's at sea. It's going to be worse for
12 him.

13 COMMISSIONER NELSON: Well, you can't speak for
14 Steven.

15 THE WITNESS: I know. I had to say it. Sorry.

16 COMMISSIONER NELSON: Thank you.

17 THE WITNESS: Okay. Is that it?

18 COMMISSIONER FIEGEN: No. I have another
19 question.

20 THE WITNESS: That's okay.

21 COMMISSIONER FIEGEN: Because you may know I'm
22 married and you may know I'm not. But I have selective
23 hearing with my husband, and so I may have had selective
24 hearing. So I am so sorry.

25 Okay. So Commissioner Hanson asked you a

1 question. Or you made an estimate to him maybe. I can't
2 remember now. I'm so sorry. So something about they
3 never talked to me.

4 And so I have to say who is "they never talked
5 to me"? Because it sounds like -- you testified that a
6 land agent called you on behalf of Crowned Ridge II. So
7 are you saying like Mr. -- like Tyler didn't talk to you?
8 Because he works for NextEra and Crowned Ridge II. But
9 the land agent did?

10 Help me understand that statement.

11 THE WITNESS: The land agent called me, directed
12 by Ms. Kranz, because she wanted some advice on what to
13 do with the lease agreement.

14 COMMISSIONER FIEGEN: Oh. Oh, okay.

15 THE WITNESS: And she said I'm going to have to
16 let my advisor look at that.

17 COMMISSIONER FIEGEN: Oh, okay. So they did
18 call you, the land agent did, and you suggested maybe not
19 to call back.

20 THE WITNESS: Yeah.

21 COMMISSIONER FIEGEN: Okay. Thank you. That's
22 all I have.

23 MS. CREMER: Thank you.

24 Mr. Swanson.

25 MR. SWANSON: Nothing further.

1 MS. CREMER: Thank you for your time. You may
2 step down.

3 (The witness is excused.)

4 MS. CREMER: You can call your next witness.

5 MR. SWANSON: Call Amy Rall.

6 (The oath is administered by the court reporter.)

7 DIRECT EXAMINATION

8 BY MR. SWANSON:

9 Q. Would you state and spell your name for the record,
10 please.

11 A. Amy, A-M-Y, Rall, R-A-L-L.

12 Q. And where do you live, Amy?

13 A. 17192 469th Avenue, Goodwin.

14 Q. Hold on just a minute.

15 Amy, in connection with your appearance here today
16 have you caused to be prepared a two-page document I
17 believe it is? It's been marked Exhibit I-6?

18 A. Yes.

19 Q. And is that document in front of you?

20 A. Yes.

21 Q. And do you have any additions or changes that you
22 wish to make?

23 A. The only thing I would add is pretty much what Garry
24 read off of the effects easement.

25 Q. Okay. You're concerned about the same items that

1 are in the effects easement of Exhibit I3?

2 A. Yes.

3 Q. Or I-2?

4 A. Yes.

5 Q. Are you pegged or targeted to be fairly close to one
6 of these wind turbines?

7 A. Yes. I'll have number Crowned Ridge II 58 southwest
8 of me, and Crowned Ridge II 60 will be directly west.

9 MR. SWANSON: Miles, are the Intervenor -- I
10 know on some of the maps of the project the Intervenor
11 are noted in a different color?

12 Are they noted that way on A27? Or A27-2?

13 MR. SCHUMACHER: I don't believe so.

14 MR. SWANSON: Would you like to have the witness
15 demonstrate or point out where she lives?

16 COMMISSIONER NELSON: I've got it here.

17 COMMISSIONER FIEGEN: But it's still great.

18 THE WITNESS: There (indicating).

19 Q. All right. You're just northeast of one of those
20 turbines that have been marked as a safe harbor?

21 A. Yes.

22 Q. Turbine in yellow?

23 A. Yes.

24 Q. What are the circumstances of the layout of your
25 house? Do you have windows facing to the west and east?

1 A. Yes, we do.

2 Q. Are you expecting to receive shadow flicker then
3 from the wind turbine that's due west of your home?

4 A. Yes.

5 Q. And also to the south and west of your home?

6 A. Yes.

7 Q. Those are 58 and 60, I believe?

8 A. Correct.

9 Q. Are the statements in your statement, your
10 Affidavit, I-6, are those matters as we have now talked
11 true and correct?

12 A. Correct.

13 Q. All right.

14 MR. SWANSON: Offer the witness.

15 MS. CREMER: Thank you.

16 Crowned Ridge?

17 MR. SCHUMACHER: Thank you. No cross.

18 MS. CREMER: Ms. Christenson.

19 MS. CHRISTENSON: I'm not really sure what I can
20 ask.

21 MS. CREMER: You have to test the truth of what
22 she just said. So if you believe there's something --
23 you know, so I'll leave it at that.

24 MS. CHRISTENSON: No. I have no questions then.

25 MS. CREMER: Mr. Robish.

1 MR. ROBISH: No questions.

2 MS. CREMER: Staff.

3 MS. REISS: I have no questions. Thank you.

4 MS. CREMER: That would bring us to Commissioner
5 Nelson.

6 COMMISSIONER NELSON: No questions.

7 MS. CREMER: Commissioner Fiegen.

8 COMMISSIONER FIEGEN: No questions.

9 MS. CREMER: And Chair Hanson.

10 CHAIRMAN HANSON: No questions. Thank you.

11 MS. CREMER: Thank you for coming, and you may
12 step down.

13 CHAIRMAN HANSON: Forgive me. I do have one.

14 When I read on page 2 of your testimony, I just
15 noticed it again, that originally the -- one of the -- I
16 believe it was CR2-58. I'm not certain -- was creating a
17 noise level of 42.5, and it appears now it is 40.5; is
18 that correct?

19 THE WITNESS: Correct.

20 CHAIRMAN HANSON: Okay. Thank you.

21 MS. CREMER: So Mr. Swanson.

22 MR. SWANSON: Thank you, Amy.

23 (The witness is excused.)

24 MR. SWANSON: I just have one more witness I
25 would like to call, and I would like to call this witness

1 adversely. His name is Tyler Wilhelm.

2 I would like to follow up on the examination
3 that I was not permitted to undertake with him as a form
4 of recross, following up on Staff counsel's questions
5 from yesterday.

6 I have at most two questions for this witness.

7 MS. CREMER: Crowned Ridge, do you have any sort
8 of response?

9 MR. MURPHY: Well, I would object to calling
10 Tyler as an adverse witness, given that, two things,
11 Mr. Swanson had the opportunity to conduct cross during
12 our direct case. He did conduct cross. And then he
13 later wanted cross beyond the scope of redirect, and in
14 proceedings like this throughout the country at State
15 Commissions the rules are very similar that that's not
16 allowed so essentially he's asking the Commission to
17 overrule a previous ruling.

18 MR. SWANSON: I think that was in connection
19 with their case in chief. This is my case, and I should
20 be entitled to call the witnesses who are present and
21 available in the hearing room as I wish.

22 MS. CREMER: Well, we had the procedural order
23 go out, and people were to have listed the witnesses they
24 intended to call. I don't recall him being on your
25 witness list.

1 MR. SWANSON: Oh, no. He was not on my witness
2 list. But I don't wish to reargue the motion as to the
3 matter of not being entitled to crossing as a result of
4 Staff's question. I'm only trying to clarify --

5 Let me tell you what I want to clarify. May I?

6 MS. CREMER: You may.

7 MR. SWANSON: All right. What I want to clarify
8 is in the use of participation agreements would Crowned
9 Ridge be motivated to use those only in the case of what
10 were nonparticipating landowners and when the effects are
11 in excess of whatever it is the PUC will order in this
12 case?

13 So, for example, if you order, let's pick a
14 number out of the air, 30 hours of shadow flicker and
15 45 hours dBA, are they going to be amenable or would they
16 be welcoming of the use of participation agreements with
17 what were originally nonparticipants only if either or
18 both of those effect levels are to be exceeded?

19 That's my question.

20 MR. MURPHY: I think I can help. I think that
21 question was answered several times, and the answer is
22 no, that we are -- that if those -- one, we don't have
23 any --

24 CHAIRMAN HANSON: Excuse me. Excuse me. I
25 don't know that it's within your realm at this juncture

1 to testify as to -- I know you can say what you believe,
2 but that's already testimony.

3 If we've got the person here to testify, I would
4 think that if it's been asked and answered, it's going to
5 be on the record. I don't want to go through the process
6 of trying to find it on the record because I know it took
7 more than one question to answer it. Why not just let
8 him come up and answer the question.

9 MR. MURPHY: I agree with you, and that's what I
10 was trying to say. I believe it's been asked and
11 answered. So I'm not -- and I would have a standing
12 objection to recalling him. But it is your decision.

13 MS. CREMER: Okay. So, Mr. Swanson, would
14 Mr. Murphy's response be adequate --

15 MR. SWANSON: No.

16 MS. CREMER: Well, you didn't even let me
17 finish.

18 MR. SWANSON: I'm sorry. I honestly do not
19 believe that question was asked and answered.

20 MS. CREMER: Well, heaven forbid we leave an
21 unanswered question here.

22 Mr. Wilhelm, you just need to come on up. And
23 you may have a standing objection to all of this.

24 And let me just do this. Do you need a minute
25 to talk to your client?

1 MR. MURPHY: I would not mind that.

2 MS. CREMER: Yeah. And we need a break anyway.

3 MR. MURPHY: Right. Because this is fairly
4 unusual.

5 MS. CREMER: Absolutely. So we will break until
6 3:15.

7 (A short recess is taken.)

8 MS. CREMER: So we'll go back into session.

9 Mr. Wilhelm, you are still under oath, and,
10 Crowned Ridge, you have a standing objection.

11 DIRECT EXAMINATION

12 BY MR. SWANSON:

13 Q. Mr. Wilhelm, I believe I have -- oops. Let's try it
14 with the button on.

15 I believe I have just a single question for you.
16 And you were here when I posed the question, I think, so
17 do you understand my question?

18 A. I would ask that you repeat the question, please.

19 Q. All right. We had had a discussion to some extent
20 on the record about participation agreements yesterday.

21 Do you recall that discussion?

22 A. I do.

23 Q. And Staff counsel had also asked you a question
24 about participation agreements.

25 The question I would like to ask you is at what

1 point in time or at what occasion would Crowned Ridge,
2 your employer, consider or propose the use of a
3 participation agreement with someone who has been
4 previously a nonparticipant?

5 Would the occasions include only when whatever the
6 effects level that will come out of this PUC final
7 decision for noise and shadow flicker -- when those are
8 being exceeded, or would it be on any other occasion such
9 as when those levels have not been exceeded? That's
10 really a long discussion but --

11 A. Yeah. There was a lot of stuff said right there.

12 I believe the -- could you shorten the question for
13 me?

14 Q. Well, let me try it again.

15 The question that I'd like to ask is on what
16 occasions, if you know, would Crowned Ridge use a
17 participation agreement? Would it use them whenever the
18 effects level ordered by the PUC are being exceeded?

19 Would you use it in that case?

20 A. That would be a situation where it would be used.
21 However, the project -- we aren't expected to exceed any
22 of the local or state siting requirements to where we
23 would have to utilize a participation agreement.

24 Q. Well, I understand. There's a lot of things I don't
25 expect to be doing either and I find myself doing them

1 and that's just the way it is.

2 MR. MURPHY: Objection. You know, this is --
3 it's not a question. It's commentary on his life.

4 MR. SWANSON: Aren't you interested in that?

5 MR. MURPHY: I am actually not interested at all
6 in that.

7 MR. SWANSON: Thank you.

8 Q. So, Mr. Wilhelm, if you were to find yourself
9 exceeding the effects level, whether it's sound or shadow
10 flicker or both, is that an example where you would use a
11 participation agreement?

12 A. It would be. But, more importantly, we'd be out of
13 compliance, and we'd need to fix that issue.

14 Q. I understand that. Understand.

15 Would you ever use a participation agreement on any
16 other occasion, even where the effects levels are not
17 being exceeded?

18 A. I'm going to try to shorten the response to I think
19 the direction you're going. We execute participation
20 agreements with people who want to participate in the
21 project. You know, if people are not interested and have
22 expressed that they're not interested in the project,
23 then, you know, we respect their opinion and go from
24 there.

25 But we've completed our land acquisition process and

1 our outreach and have all the easements necessary and,
2 you know, we've concluded that process.

3 Q. I understand that.

4 Now this all started, as I recall, when I received a
5 production of a Staff request to you that was then
6 responded to you about so-called good neighbor
7 agreements.

8 Do you recall that?

9 A. I do.

10 Q. In that response did you say we will or not -- will
11 not use good neighbor agreements?

12 A. I said we do not offer good neighbor agreements.

13 Q. And you don't plan to offer one for this project?

14 A. That's correct.

15 Q. All right. Is the participation agreement something
16 other than a good neighbor agreement?

17 A. The term "good neighbor agreement" is something
18 that's used within the industry. We have a participation
19 agreement. I can't -- I can't speculate what goes into a
20 good neighbor agreement. We have a participation
21 agreement.

22 Q. All right. I thought the response using the term
23 good neighbor agreement was in your response, not in the
24 question posed.

25 A. I have -- in one of the Data Requests, my responses

1 to the Data Requests, I did state that we do not offer
2 good neighbor agreements on this project.

3 MS. CREMER: So I believe you said one question.
4 He has a standing objection. I am -- this to me has all
5 been asked and answered. But I'm seeing -- did you guys
6 want to say something?

7 COMMISSIONER NELSON: I've got a question. But
8 I promise I've got just one.

9 COMMISSIONER FIEGEN: Oh, my. I object.

10 MS. CREMER: Commissioner Fiegen, did you
11 have -- or did you want something?

12 COMMISSIONER FIEGEN: I just object to
13 Commissioner Nelson. But other than that, I guess I'm
14 only one vote. Go ahead.

15 Just kidding. I was just kidding. Just
16 kidding.

17 MS. CREMER: So at this point I am sustaining a
18 portion of the continuing objection. I believe you asked
19 your question. We have had these.

20 But, Commissioner Nelson, if you want to ask a
21 question, which might prompt a response from Mr. Swanson.

22 MR. SWANSON: Did I get an answer? I don't
23 think so.

24 MS. CREMER: Yes. You got an answer. I waited
25 until he was done talking.

1 COMMISSIONER NELSON: The agreement that a
2 participant signs that we have all been talking about, if
3 the participant's property does not host any of the
4 infrastructure for this project, are there annual
5 payments made to that person?

6 THE WITNESS: Yes.

7 COMMISSIONER NELSON: Thank you.

8 MS. CREMER: So I'm trying to think in my head
9 if that prompts the ability for anyone else to ask a
10 question.

11 And it appears he is Mr. Swanson's adverse
12 witness. So, Mr. Swanson, do you have a question for
13 redirect based on Commissioner Nelson's question?

14 MR. SWANSON: I do not.

15 MS. CREMER: All right. Thank you. You are
16 excused, Mr. Wilhelm.

17 (The witness is excused.)

18 MS. CREMER: Okay. So, Staff, did you have a
19 question that needed to be asked?

20 MS. REISS: Kristen may, but I -- Staff does not
21 at this time, no.

22 MS. CREMER: Thank you.

23 Was that your last witness?

24 MR. SWANSON: Yes. That's it.

25 MS. CREMER: Thank you. Moving on.

1 So, Ms. Christenson, Mr. Robish, you did not
2 file prefiled testimony so you have no direct case to
3 present.

4 That would take us to Staff. You may call your
5 witness.

6 MS. EDWARDS: Staff calls David Lawrence.

7 (The oath is administered by the court reporter.)

8 DIRECT EXAMINATION

9 BY MS. EDWARDS:

10 Q. Mr. Lawrence, welcome. Can you please state your
11 name for the record.

12 A. My name is David Lawrence. My business address is
13 4820 East 5th Street, Suite 8 in Sioux Falls.

14 Q. What is your professional title, job title?

15 A. I'm a state certified general real property
16 appraiser in South Dakota.

17 Q. And as a state certified general real property
18 advisor [sic], what are your job responsibilities?

19 A. Primary job responsibilities are valuation services,
20 real estate consulting, and market impact analysis.

21 Q. Can you please briefly describe your relevant
22 educational background.

23 A. Sure. I graduated from Western University
24 completing a business degree. My continuing studies, I
25 directed those towards the Appraisal Institute for my

1 real estate profession where I obtained the MAI
2 designation, the SRA designation, the AIGR-SS [sic]
3 designation, and the AIG-RR [sic] designation.

4 From there I also continued my education and studies
5 in real estate with the International Right of Way
6 Association where I received the SRWA designation.

7 Q. And can you briefly describe your relevant work
8 experience?

9 A. Sure. I have a wide range of background in real
10 estate appraisal in South Dakota, starting with
11 residential, commercial, through my profession. Most of
12 my time has been spent on right-of-way projects, energy
13 related and infrastructure projects around the Midwest.

14 Q. Have you testified before this Commission
15 previously?

16 A. Yes, I have, I believe a few times in previous wind
17 dockets.

18 Q. Thank you.

19 And drawing your attention to what has been marked
20 as Staff Exhibit S5, and I have that in front of you?

21 A. I have that in front of me.

22 Q. Do you recognize that document?

23 A. Yes, I do.

24 Q. Is that your prefiled testimony?

25 A. Yes, it is.

1 Q. Do you have any additions, deletions, or corrections
2 to make?

3 A. I have one correction. Within my sales analysis I
4 misstated the manufacturer of the wind turbine. It
5 should be GE.

6 Q. And that's in S5?

7 A. Yes.

8 Q. An attachment or --

9 A. In the sales analysis of my exhibits.

10 Q. Sure. Thank you.

11 If I asked you the same questions today as those
12 posed in your prefiled testimony, would your answers be
13 the same?

14 A. Yes, they would.

15 Q. And drawing your attention to what has been marked
16 as Staff Exhibit S6.

17 A. Okay. That's in front of me.

18 Q. Do you recognize that document?

19 A. Yes, I do.

20 Q. And what's that?

21 A. That's my Supplemental Testimony that I filed on
22 January 23, 2020.

23 Q. At the time it was filed was it true and correct to
24 the best of your information and knowledge?

25 A. Yes.

1 Q. Do you have any additions, corrections, or deletions
2 to make at this time?

3 A. Same -- I had the turbine type misidentified. It
4 should be GE.

5 Q. In what sale was that?

6 A. CD-2.

7 Q. Thank you.

8 And can you please briefly summarize the content of
9 your testimony, both Direct and Supplemental?

10 A. Okay. Sure.

11 In preparation of my testimony I was asked by the
12 PUC Staff to update my research for a 2018 Market Impact
13 Study that I completed in Brookings County in regards to
14 influences of wind turbines projects and towers on
15 residential selling prices of homes near proximity of a
16 project.

17 With that research, identified 16 sales transactions
18 in South Dakota. And with those 16 sales transactions I
19 completed an interview analysis to verify details of the
20 sale. I completed site analysis where I actually went
21 out and looked at the properties.

22 And then I also completed a sales analysis where I
23 looked at the selling price of the influenced property
24 and compared it to noninfluenced properties around the
25 areas that weren't in proximity to a wind turbine,

1 commonly referred to as a sales paired analysis.

2 With those 16 sales, 15 sales did not show any
3 measurable effect on the selling price. 9 of the
4 transactions were in proximity to an existing wind
5 turbine that was in operation. And then there were seven
6 of the sales that I identified that sold within a
7 permitted wind project or near a project, but the wind
8 tower construction was not in operation or complete.

9 Of one of those sales that I identified, for the
10 first time I did find a sale that did show a negative
11 influence to the negotiation process of the transaction,
12 which was identified in my exhibits as CD-2. I think in
13 this hearing it's been commonly referred to as the
14 Richter sale.

15 And with that sale there was a -- that sale was
16 south of Waverly, South Dakota, within the footprint of
17 the Crowned Ridge Wind project. That sale was listed on
18 the Watertown MLS, and there was an offer on the property
19 for \$350,000. The seller disclosed the proximity of a
20 wind tower or future location of a wind tower, and the
21 buyer canceled the offer due to the proximity of the wind
22 tower, not wanting to live around the tower near the
23 property. The property later sold for \$275,000.

24 From that sale with -- excuse me. And from that
25 sale -- so there was a difference in the selling price.

1 To quickly summarize that sale, I continued with my
2 Supplemental Testimony in January to investigate that
3 transaction to determine why or what was going on with
4 it.

5 I contacted every member of the transaction that I
6 could get ahold of to interview them of what motivations
7 or what were going on with that sale and why there was a
8 difference in the selling price. I interviewed both
9 sellers of the property. I interviewed the buyer that
10 canceled the transaction, and I interviewed the seller
11 and both brokers of that.

12 And the facts of the transaction were influenced
13 during the negotiation process of the disclosure by the
14 seller of the wind tower or the future location that
15 affected that sale price.

16 Also with -- just to summarize my Supplemental
17 Testimony with the work I completed, I also -- an
18 intervenor provided additional information to me on some
19 of the information of the sales research that I completed
20 around Gary, South Dakota, that I included in my
21 analysis.

22 One thing, just to summarize some things that were
23 particular about the Richter sale that I thought were
24 unique, there seemed to be some things with the sales
25 transactions that were difficult to apply to every rural

1 residential sale in the proximity of a wind tower.
2 However, the sale did show -- the sale did show -- in my
3 opinion, it did show that there is a population of
4 South Dakota -- of market participants that are sensitive
5 to living around wind towers.

6 And from that sale I also gathered that there is
7 a -- depending on the legal question is answered about
8 the South Dakota Disclosure form, there could be some
9 influence on the transaction of how the seller -- or if
10 they would disclose the proximity of a future wind tower
11 or project around their home if they would go to sell the
12 property.

13 Q. Thank you.

14 You just mentioned that an intervenor gave you some
15 additional information?

16 A. Yes. That's correct.

17 Q. Was that intervenor in this docket or a different
18 docket?

19 A. I believe that was a different docket. And that is
20 included in my Supplemental Testimony, the information
21 that they provided.

22 MS. EDWARDS: Thank you. I have no additional
23 questions on direct and tender this witness for cross.

24 MS. CREMER: Thank you.

25 Crowned Ridge?

1 MR. MURPHY: No cross.

2 MS. CREMER: Mr. Swanson.

3 MR. SWANSON: Just a few questions of
4 Mr. Lawrence.

5 CROSS-EXAMINATION

6 BY MR. SWANSON:

7 Q. I think you and I met in a case a few years ago.

8 A. Really? What case was that?

9 Q. Old school property in Lennox, South Dakota. I was
10 an expert, and so were you.

11 A. I do remember that with Meierhenry.

12 Q. Meierhenry. Now retired.

13 A. That was a good case. I was honored to be a part of
14 his case.

15 Q. Yeah. What a class act.

16 A. Yes.

17 Q. Mr. Lawrence, I've only had a brief chance to look
18 at your filings. Let me just ask the questions this way:

19 In your appraisal work dealing with residential
20 property in and around wind farms, do you document as
21 part of your appraisal analysis the distance to one or
22 more wind turbines?

23 A. Okay. Just so I can clarify it, you're referring to
24 it as an appraisal. Are you referring to my market
25 study --

1 Q. I'm sorry. You are an appraiser.

2 A. Yes.

3 Q. But you were doing a market study here?

4 A. In terms of the profession, so I don't get confused,
5 when you say "appraisal" to an appraiser I'm assuming
6 opinion of value is performed for specific property. And
7 what I performed for this hearing for the update of my
8 2018 research was a Market Impact Study that I looked at
9 where I looked at sales transactions of rural homes that
10 sold near the proximity of a wind farm so --

11 Q. Right. As part of your analysis then did you make
12 any comparison of how far those homes are from one or
13 more wind turbines?

14 A. In some of the sales transactions that occurred,
15 yes, I was able to estimate the proximity to the
16 property.

17 Q. So you might -- if you have an estimate made, did
18 you note it in your work?

19 A. Yes. In my exhibits included with my testimony I
20 believe they would be references to BK sales near the
21 Buffalo Ridge Brookings County area. Because, as I said
22 previously, I identified 16 sales transactions. Of those
23 sales transactions, there were nine sales that occurred
24 let's just call it in the Buffalo Ridge Brookings County
25 area with existing turbines running and they have a

1 history of operation.

2 And what was particularly interesting that I
3 identified was six or seven sales in the footprint of a
4 permitted wind project. However, there was no turbines
5 surrounding the property yet. It was only the perception
6 that they were going to be there. And so just to
7 differentiate between those.

8 So those it was harder to estimate the specific
9 distance. It was just based on a map and a calculation
10 that I could do with those to determine the distance of
11 where those towers were going to be versus the ones in
12 Brookings County where I could look at a GS, they're on
13 an aerial, and I could estimate the specific feet away
14 from the property.

15 Q. All right. So whatever information you got about
16 existing wind farms and property and the distance was
17 something that you went through and determined on your
18 own as an estimate?

19 A. Yes.

20 Q. All right. Did you also determine whether or not
21 those residential properties near an existing wind farm
22 were subject to a particular sound level or elevated
23 sound level perhaps?

24 A. Excuse me. I didn't have a statistic measure. My
25 measure of sound was driving onto the property and if

1 there was evidence of sound from a wind turbine or not.
2 I would acknowledge that is sound.

3 Q. All right. So you didn't go dig through a record
4 somewhere and determine what has been determined as an
5 established sound level for that property?

6 A. No, I did not.

7 Q. Did you do anything to quantify whether the property
8 was subject to shadow flicker at all?

9 A. I did that in two ways. I did that through my
10 interview analysis with participants that owned the
11 property. It could have been the buyer or seller at the
12 time.

13 If that was brought up during the interview process,
14 I would have done that through my site analysis when I
15 visited the property. If the turbines were turning that
16 day or if it was I shadow or noise on that property when
17 I visited, I would have noted it in the sales analysis.

18 Q. All right. So whatever determination you made about
19 noise or shadow flicker as being an issue for that
20 residence, you would have noted it in your analysis?

21 A. I would. There would be some comment from the
22 seller or buyer or who I interviewed. Or maybe there
23 would have been a comment of what I observed that day
24 when I was at the sale -- or at the property.

25 Q. All right.

1 MR. SWANSON: That's all I have. Thank you.

2 MS. CREMER: Ms. Christenson.

3 MS. CHRISTENSON: Thank you. I just have a few
4 questions too.

5 CROSS-EXAMINATION

6 BY MS. CHRISTENSON:

7 Q. In Brookings County did you research through
8 whatever means would be available to you, whether that be
9 real estate agencies and/or brokers in the area of any
10 sale -- or any properties that I would call no sales
11 where properties had been listed -- and I'm speaking only
12 of rural residential properties. Property would have
13 been listed in the area of a wind turbine that --

14 A. Oh. Excuse me.

15 Q. No. Go ahead -- and a sale was never completed?

16 A. Let me explain my research process a little bit of
17 how I identified sales in Brookings County to determine
18 the transaction. Because it's a good question to see if
19 there are expired listings that didn't sell.

20 To identify sales transactions that occurred in
21 proximity to a wind turbine, my first source was the --
22 Brookings has a site called Beacon, if you're familiar
23 with it that you can subscribe to, and it lists all the
24 sales for a period of six to 10 years that I used to look
25 at.

1 Now that doesn't have expired listings, but that
2 does show sales that occurred. And from identifying
3 rural residential sales, I took those sales and addresses
4 that I was able to identify in Beacon, and then I would
5 match them up on the aerial of the location like on a
6 Google map.

7 And then from there it's pretty obvious when you
8 look at an aerial where the turbines are located and,
9 okay, I've identified a transaction. So that was one way
10 I identified sales.

11 The other way was through the Brookings County MLS,
12 which I did query searches for expired listings that were
13 near turbines and sales transactions. And if I would
14 have identified a sale that was expired, it wouldn't have
15 been specific market evidence, but it would have been
16 part of my -- maybe something that I might have looked at
17 to see what was going on and why that property didn't
18 sell. And so that would have been part of my research
19 that I would have completed.

20 Q. Very good explanation. Thank you.

21 A. So if you know of an expired listing, I'd sure be
22 interested in it.

23 Q. Okay.

24 So two properties that you discussed were the
25 Richter property and then the one submitted by an

1 Intervenor. Those properties were both rural residential
2 and recently sold; correct?

3 A. You know, that's a good point. I just thought about
4 something because that was one -- you just identified
5 something that I missed. Well, that was not included.

6 Richter was a sales transaction that did occur
7 that's closed. Okay. It's recorded with a deed in the
8 Register of Deeds. There is one sale that I didn't
9 mention in my Direct Testimony called JE-1 that was an
10 expired sale. That was near Toronto.

11 So I don't believe that -- I can't remember what MLS
12 system that was captured on. I think that would have
13 been in the Watertown but not the Brookings area MLS. So
14 there was an expired listing that I looked at. And I
15 actually went to the property and met with the owner on
16 it.

17 Q. And what did you learn?

18 A. It's in my Direct Testimony.

19 Q. Oh.

20 A. I don't know if you read that.

21 Q. Well, I thought I did. But I read a lot.

22 A. Yeah. It was -- it's a very interesting property.
23 Some of the wind turbines are within, from my estimate,
24 700 to -- 800 feet to 1,500 feet, surrounding the
25 property.

1 And, you know, I inspected the property. There was
2 a newspaper article about this gentleman's property and
3 his ability to -- he had a difficult time selling the
4 property. It never sold. So I was never able to further
5 analyze anything because I didn't have a completed sales
6 transaction to look at.

7 Q. Thank you.

8 One other question is did you -- or were you able to
9 look at statistically are there more new listings in the
10 areas of these wind developments than historically how
11 often they changed ownership?

12 I might not have asked that very well, but you kind
13 of get it?

14 A. I understand what you're getting at.

15 Q. Okay.

16 A. You're trying -- I would say it's more difficult in
17 the research that I performed because in rural areas --
18 as you know, rural properties don't transfer as often as
19 properties within the city limits of Brookings or
20 Watertown. So that gets to be a difficult statistical
21 measurement.

22 I would say that in the sales that I did research --
23 and actually I recently identified a number of them in my
24 exhibits that did transfer within Brookings County.
25 Since my sale research was completed in 2018, I think

1 there were three sales that I identified, and even as
2 recent of closing as November of 2019 that --

3 I interviewed the seller, and the seller provided me
4 some pessimistic comments about, you know, shadow and
5 noise around the house. But when he put the property on
6 MLS it sold within 30 days, close to his asking price,
7 which I was surprised about too.

8 And what was more interesting about this sale is
9 that he purchased the property in 2016, resold it in 2019
10 for a 6 percent appreciation a year on that property.

11 So a seller's telling me things, negative comments
12 about living around wind towers, you know, that I hear
13 everyone talking about from shadow and noise, but yet
14 when he goes to sell the property it doesn't seem there's
15 any measurable effect on the selling price.

16 Q. Can you tell me where that property is located in
17 relation to a city population? I'm saying like Watertown
18 where someone would work, Milbank, Brookings. A sizable
19 community?

20 A. It's east of Brookings. I can't remember the
21 exact mileage. Obviously Brookings to the
22 Minnesota/South Dakota border is fairly close. What is
23 it, 25 minutes?

24 So I don't remember the exact distance. It's a
25 rural property. It's far enough away so it's not

1 influenced by the immediate proximity of Brookings, but
2 it's within, you know, a reasonable driving distance. I
3 could give that address to you if you wanted it. I just
4 don't have it right here in front of me.

5 Q. No. That's okay. That's a good generalization for
6 me.

7 MS. CHRISTENSON: Those are all my questions.
8 Thank you.

9 MS. CREMER: Mr. Robish.

10 MR. ROBISH: I don't have any questions, but I'm
11 really impressed with you.

12 THE WITNESS: Thank you.

13 MR. ROBISH: You know your stuff, and you don't
14 have to read it and study through it. You know your
15 stuff.

16 THE WITNESS: Well, thank you. I try to be very
17 thorough with what I do.

18 MR. ROBISH: You're very accommodating.

19 THE WITNESS: I know this is a sensitive topic
20 to nonparticipating landowners. And I take my job
21 seriously, and when I do this kind of work I get
22 involved. And one of the things I do is I meet with a
23 lot of people around South Dakota. I go to their houses.
24 I call on the phone.

25 MR. ROBISH: Well, you don't know how I

1 appreciate that. Thank you very much for your testimony.

2 THE WITNESS: Thank you.

3 MS. CREMER: That brings us to Commissioner
4 questions.

5 Commissioner Fiegen.

6 COMMISSIONER FIEGEN: You know, I'm going to let
7 Gary start, and then I do have questions -- or I'm sorry.
8 Chairperson Hanson, if you would like to start. But I do
9 have questions later but I'm going to let you start and
10 I'm going to clean up. One, two, three.

11 CHAIRMAN HANSON: You are a baseball fan; right?
12 Good afternoon.

13 THE WITNESS: Good afternoon.

14 CHAIRMAN HANSON: I don't know whether I should
15 start out or end by congratulating you. It sounds like
16 I'm starting out that way. You really did a good,
17 thorough job. I am impressed.

18 I was an appraiser for a very long time and a
19 broker, and I owned a company and did a lot of this work
20 that you're doing. And you did a very, very good job.
21 Very impressed with it.

22 Also the fact that you were able to find 13
23 comparables. That's amazing.

24 THE WITNESS: It takes a while.

25 CHAIRMAN HANSON: Yeah. A lot of groundwork.

1 And I like the way you put things together for us, the
2 way you explained certain situations. You know, there's
3 a lot of conflict here within the information that you
4 receive as you go through this process, and you wrote
5 that and explained it.

6 And on page 6 you explained that the evidence
7 supports the presumption there have been no adverse
8 effects on the selling price of rural residential
9 properties in proximity to a wind tower. And then you
10 explained, however, there seems to be. And the interview
11 and site analysis support the presumption that proximity
12 to a wind tower can influence the quiet enjoyment of the
13 property and view of the rural scenery.

14 And I'm going to get to a question here. But
15 also on page 10 you explained, "An interview with the
16 seller in this particular instance provided nothing
17 positive about living within the proximity of the
18 towers." That's so telling about all of the concerns
19 that everybody has.

20 But the sales data shows that the property sold
21 within 25 days on the market and had a market
22 appreciation rate of you explained it was over 6 -- 6 and
23 twenty-sixth -- 6.26 percent a year. And so that's a
24 significant increase. And the seller reported numerous
25 potential buyers. And this is what's curiosity for me,

1 brings me to a question.

2 "The seller reported numerous potential buyers
3 which showed initial interest would not consider the
4 property because of the surrounding proximity of the wind
5 towers near the residence," which bears out everything
6 that everyone's been saying about the concern of the
7 value of their property.

8 Now I have to admit as I'm reading these
9 different things, portions of it, I thought for sure you
10 were going to come up with the fact that, yes, there's an
11 effect on the valuation of the property. And here you
12 say that "Many negative comments from the market" -- did
13 you mean the market or did you mean the buyer? You meant
14 the marketplace; right?

15 THE WITNESS: Market participants.

16 CHAIRMAN HANSON: -- "and the seller but the
17 sales data suggests normal market transaction without any
18 measurable effect on the selling price."

19 You know, it's just -- it just doesn't fit with
20 everything that we see in history on valuations and
21 sales. You know, if there's a whole lot of negatives on
22 a property, how in the world does it sell so quickly?

23 Is it because Sioux Falls grew from 150,000 to
24 200,000 in that short period of time that there's so many
25 people moving here? Could that be an influence on market

1 values in that area? Did you take that into
2 consideration?

3 THE WITNESS: Yeah. You asked a lot of
4 questions at once so we'll see -- I prefer one at a time,
5 but let me see if I can answer this.

6 I would say that -- I mean, I do a lot of these
7 type of damage studies on different type of properties,
8 energy projects. I would say that you could see my
9 conclusions as I was developing them. Okay. I'm
10 completing these interviews with market participants.
11 And these are sometimes I would talk to people who hadn't
12 sold their home and just lived around the towers and just
13 tell me about your experience.

14 And so you can see that I was starting to
15 develop opinions from what people were telling me who
16 lived around them. There's shadow. There's noise.
17 Okay. I'm getting -- you know, I'm getting data from
18 people telling me that there are effects around their
19 property.

20 And then I'd go visit. You know, I want to go
21 see what's going on with these. I'd go to some
22 properties. And some of the site visits that I'd make
23 specifically in the Buffalo Ridge area -- and that seemed
24 to be an early permitted project. Obviously, the
25 setbacks from some of the homes are a lot closer than

1 what's being done now in the dockets.

2 And I would go out there, and I'd hear noise.
3 You know, sometimes I'd see the shadow flicker that
4 people are talking about. And I thought, okay, you know,
5 I'm seeing some of this too. And then I'd go take the
6 sales data and I would compare it to what's selling
7 around the neighborhood or market area that's not near
8 the towers and the data would show that there's no
9 difference in the selling price. And so that surprised
10 me to be honest with you.

11 I thought I was headed towards a damage
12 conclusion on some of these. And the sales data doesn't
13 support that. But then I'd also -- I'd hear from some
14 people from the negative comments. But then I'd also go
15 back, like the you one -- we talked about with 6 percent
16 appreciation. I was really surprised about that one.
17 That was in November of 2019 that sold in 30 days on the
18 MLS.

19 The seller reported the flicker effect, the
20 noise, didn't like wind towers, was glad not to be living
21 around them but yet he had 6 percent appreciation on his
22 home and it sold within 30 days. That's pretty good.

23 I think some of that's attributed to the
24 location near Brookings because I think there is probably
25 a limited supply or smaller supply of rural acreages. I

1 think the price range that that sold at, I can't
2 remember, I think it was 230. I could be off. But it
3 was in that range of properties that sell really well,
4 like \$200,000 range.

5 But, then again, if you look at I think it
6 was -- there was a sale back in 2018 that identified --
7 DE-4, I was surprised at this one too, that sold for
8 \$530,000. And it was on MLS. And I drove up into the
9 yard and went and talked to the gentleman. And I said,
10 well, you just paid \$530,000. What about these wind
11 turbines? And I can hear them and this. And he said
12 that doesn't matter, you know.

13 And I went and researched the sales data, and it
14 was the highest price for a rural residence in that area
15 in 2013.

16 And so I think I'm answering your question. It
17 goes all over. To bring this together, I was surprised
18 because I get one side that tells me about these negative
19 influences on their property and seemed it legitimate,
20 but you can compare it to the sales data and the sales
21 data doesn't support the comments. It shows that these
22 properties do sell within the range of the market that
23 are uninfluenced sales.

24 CHAIRMAN HANSON: There's a number of things to
25 take into consideration there. And you did point out

1 that they were arms-length transactions. When something
2 appreciates by nearly -- well, 20, 26 percent, depending
3 on the 15 to 19, how many years you're looking at there,
4 improvements are also pertinent. Were there -- the guy
5 had a double garage or a new roof or family room or
6 something off the back?

7 THE WITNESS: That affects appreciation. And
8 the one that we're talking about, the 6 percent during
9 the interview, nothing. I think the gentleman kept his
10 house in well maintained condition, but there weren't
11 anything new or remodeled condition for that appreciation
12 rate.

13 There was one north of Gary that I identified
14 that had a significant appreciation. But when I talked
15 to the seller of that property, or maybe it was the
16 broker, there was some remodeling done, which would
17 explain a significant jump in appreciation. Maybe not
18 attributable to maybe market timing but specifics that
19 have been improved on the property.

20 CHAIRMAN HANSON: Oftentimes in MLS you're able
21 to obtain a photo of the house prior to this other person
22 buying it.

23 Were you able to see something of that nature?

24 THE WITNESS: I don't recall doing that for this
25 home. The one north of Gary, I didn't -- I probably

1 didn't further investigate that because I felt like the
2 interview gave me the reason for why the appreciation,
3 because he did a significant remodel on the home from
4 when he purchased it to when he sold it.

5 CHAIRMAN HANSON: Okay. In my experience a lot
6 of times when you have that many folks looking at a
7 property, you often sell the house for a higher price
8 than what it's listed for. You get people jumping back
9 and forth presenting several offers, and the person who
10 wants it the most pays more for the property.

11 Do you think that could have been a phenomenon
12 here that was missed? Because so many people that were
13 potential buyers for this property decided, no, I don't
14 want it. You took those people out of that mix of the
15 opportunity for looking at the property and making an
16 offer, which would cause someone else to increase theirs?

17 Do you think there might have been a loss of
18 equity there for the seller?

19 THE WITNESS: Which property are you referring
20 to? I'm sorry. You jumped from one --

21 CHAIRMAN HANSON: No. You jumped.

22 THE WITNESS: I apologize.

23 CHAIRMAN HANSON: No. That's fine. I'm talking
24 about the 20 or 25 percent increase in value.

25 Any one of the properties that you're dealing

1 with. If you've got a lot of buyers, do you think that
2 might be an opportunity lost when -- if you lose a
3 population of buyers, you lose the opportunity for a
4 higher price?

5 THE WITNESS: I would say my favorite answer is
6 it depends. But I would say any time -- you know, as
7 long as you have two potential buyers, you have potential
8 for, you know, a bidding process.

9 So just because you remove from that buyer pool
10 some of the market participants that don't want to live
11 around a rural residence in proximity to a wind tower
12 doesn't mean you're not going to have demand for that
13 home. Because, obviously, from my research there's
14 market participants that it doesn't bother. Or else we
15 wouldn't have 15 sales transactions of properties selling
16 around the area, you know, in proximity to a wind tower.

17 CHAIRMAN HANSON: In your writings here I
18 believe you said 13 comparables at one point, and then
19 you just -- no. Yeah. 13. And you said 16 in your
20 oral --

21 THE WITNESS: Let me clarify that.

22 I was referring to, okay, in my 2018 research I
23 believe it was -- you're testing me on this now. I
24 identified a certain amount of rural residences that
25 sold.

1 Because in my previous 2018 research I included
2 some agricultural. There might have been some other
3 different sales. For this update my specific direction
4 for the scope of work for this study was rural
5 residential properties.

6 So I already had a data set from the Brookings
7 County ones that identified I think it was six or seven.
8 And then I identified some additional sales near Gary and
9 Waverly that I communicated. So I think there was a
10 total of 16 sales, of sale transfers of rural residential
11 properties.

12 CHAIRMAN HANSON: I appreciate Staff putting on
13 this witness because you have a great deal of credibility
14 with me.

15 Thank you very much.

16 COMMISSIONER NELSON: Did you listen to
17 Mr. MaRous testify yesterday?

18 THE WITNESS: Yes.

19 COMMISSIONER NELSON: And you heard the
20 questions I asked him about the disclosure statement.

21 THE WITNESS: Yes. If you're asking to ask me
22 what -- I'd like you to remind me what those questions
23 were.

24 COMMISSIONER NELSON: Well, I was going to try
25 to get by easy by just asking if you agreed with his

1 conclusions, but I will you ask the questions.

2 THE WITNESS: Okay.

3 COMMISSIONER NELSON: So the disclosure
4 statement that was at issue in the Richter property --
5 and I'm not an expert, but I read through a disclosure
6 statement, and it appears to me that it is asking to
7 disclose those things that are located on that property.

8 I didn't see anywhere on there where it asks
9 about things that are on the neighbor's property.

10 THE WITNESS: Uh-huh.

11 COMMISSIONER NELSON: And so is it your
12 conclusion that Mr. Richter was required to disclose what
13 he anticipated happening on the neighbor's property?

14 THE WITNESS: Okay. Well, you're going in
15 contrary to my testimony that I didn't want to provide a
16 legal opinion on that.

17 COMMISSIONER NELSON: I understand.

18 THE WITNESS: So putting me in a tough position.
19 But that's okay because I brought this up in my
20 testimony. Because when I was researching out sales in
21 the Waverly and Gary market I was surprised by brokers --
22 brokers brought this up.

23 And then it happened with the Richter sale.
24 That's the only reason that I started to think about this
25 process.

1 With disclosure and the proximity of the wind
2 tower, that's a tough question to answer. And I still
3 think it's a legal question. It's not for an appraiser
4 to answer. But I tried to answer to the best of my
5 ability by asking the real estate profession.

6 And if you look at the question I specifically
7 put in my testimony about what material facts are
8 relevant to this property -- and when I said, hey,
9 Real Estate Commission what do you do here? I've got
10 brokers going back and forth --

11 (Discussion off the record.)

12 THE WITNESS: So I contacted the Real Estate
13 Commission to ask what their interpretation of a material
14 fact is. And, obviously, they said it's a legal opinion.
15 Ask an attorney. But we'll give you the definition that
16 we provide brokers to answer the question.

17 So it's very vague. It was to the fact of it's
18 any relevant fact that a buyer would want in the
19 decision-making process. So that's open. That's really
20 open. Okay.

21 So do I believe that that's everything outside
22 of a property? No. In my opinion, no, it's not. But
23 can it be a relevant fact that will affect the buyer of
24 that property? Yes.

25 So if I was to ask Intervenors in these

1 proceedings if you were to buy a rural residential
2 property, would you consider it to be a material fact of
3 disclosing the proximity of a wind tower to a property, I
4 bet they would answer yes. So if I would ask the seller
5 of one of the sales that identified in my study if that
6 was a relevant fact that should be disclosed, there's a
7 number of them there I would guess that would say, no, it
8 didn't matter to me. So it comes back to buyer
9 preference.

10 Obviously, in the Richter case I've talked to
11 him many, many times on that because it was very -- it
12 was very particular the timing of his disclosure that
13 caused the sale to fall through. And I asked him, I
14 said, you know, that is not typical, during the
15 negotiation and then all the sudden you -- you tell
16 someone that there's going to be a tower across the road.
17 That should have been done a long time before you had,
18 you know, a reasonable offer.

19 Then what I learned from the conversations with
20 him is that he felt it was the honest thing to do when he
21 became aware of the location of the tower. So and he
22 felt that that was a relevant fact that needed to be
23 disclosed. And, obviously, the buyer of the property was
24 one of the people that are sensitive to wind towers and
25 wind projects and didn't want to live around it.

1 So to come back to your question, I don't know
2 how to answer that.

3 COMMISSIONER NELSON: Thank you. I appreciate
4 the discussion, and I think I can say that you and
5 Mr. MaRous are solidly on the same page on that question.

6 THE WITNESS: Okay. Good.

7 COMMISSIONER FIEGEN: Thank you, Mr. Lawrence.
8 And, you know, thank you for coming back. I know that
9 we've had a lot of wind permits this past year, and you
10 haven't always been available for the Staff to bring
11 forward. So I appreciate you coming.

12 But I still have a lot of questions. And I
13 really have a lot of questions about the Richter. But
14 I'm going to come back to that.

15 I want to go to Brookings first. When
16 Commissioner Hanson was asking you questions about the
17 13 or 16 or whatever, you were talking about Brookings,
18 but you made a comment about the Brookings market.

19 THE WITNESS: Uh-huh.

20 COMMISSIONER FIEGEN: Because anecdotally I've
21 heard of this, and you testified to it, that Brookings
22 may -- did you say that the Brookings market for acreages
23 or rural homes may be at a premium because there aren't
24 very many and there's a lot of people working out of the
25 Brookings area?

1 I mean, you didn't say that, but did you kind of
2 say that they were at a premium?

3 THE WITNESS: I would say premium as in price, I
4 don't know about that. But what I would clarify is
5 that -- and we see this. I'm from Sioux Falls. We see
6 this effect around Sioux Falls. It's the radius wherein
7 the closer to Sioux Falls, the more buyers you have so
8 there's more demand.

9 When I was researching a number of the sales
10 transactions with brokers and buyers of the property I
11 had a number of comments from the people that stated
12 that, you know, acreages were harder to find in the area
13 and that they don't always come for sale. And so I had
14 buyers state that when this one came for sale we wanted
15 it because it was in the location we wanted.

16 And so that was -- that's what based my opinion
17 on the -- I would say -- you know, not limited supply,
18 but there's just not a number of them that come on the
19 market for sale around Brookings.

20 COMMISSIONER FIEGEN: Sure. So Crowned Ridge II
21 is away from Brookings.

22 THE WITNESS: Yes.

23 COMMISSIONER FIEGEN: Further away.

24 THE WITNESS: Uh-huh.

25 COMMISSIONER FIEGEN: Did you make any statement

1 about your testimony on rural acreages there and the
2 availability compared to your statement that you made
3 about the Brookings area?

4 THE WITNESS: No. But I can.

5 COMMISSIONER FIEGEN: Okay.

6 THE WITNESS: I would say there's a -- not as
7 strong effect as Brookings. I think we'd all acknowledge
8 that Brookings is a very good market with the
9 universities. But Watertown, however, is, you know, a
10 very large city in South Dakota, and so it has jobs,
11 schools, and employment. And I know there's a buyer pool
12 that wants to live in the rural area around Watertown.

13 It's the same effect that I see in a lot of our
14 communities like Sioux Falls I live in; the farther you
15 get away from that time distance relationship to jobs,
16 work, and school, that buyer pool drops off. And I think
17 around the Crowned Ridge area you start to get out of
18 that from the distance. You know, when I was driving to
19 Gary I started to feel like it was too far.

20 So if that answers your question.

21 COMMISSIONER FIEGEN: Yeah. It does.

22 I'm going to go back to S6, I believe it is.
23 And it's your interview questions. And I keep on reading
24 them on that Richter project. I keep looking at them and
25 reading them, and it appears --

1 So yesterday you heard Mr. MaRous probably talk
2 about the Richter project. And so I listened to him. I
3 didn't ask him a lot of questions about it. But I
4 certainly listened to him and what he said.

5 THE WITNESS: Uh-huh.

6 COMMISSIONER FIEGEN: And he made a lot of
7 assumptions. But I look at the appraisal, and didn't I
8 see the appraisal come in at 300 -- oh, man.

9 THE WITNESS: 320,000.

10 COMMISSIONER FIEGEN: Yeah.

11 THE WITNESS: That was during an interview
12 process. So I asked for the appraisal so I could
13 substantiate that. But that gets difficult to start
14 prying that much to get that kind of information from
15 somebody.

16 COMMISSIONER FIEGEN: Right.

17 THE WITNESS: But through the interview I
18 established that the bank appraisal for the financing was
19 320,000.

20 COMMISSIONER FIEGEN: Okay.

21 THE WITNESS: I would say on the Richter sale,
22 you know, I have 15 sales transactions in South Dakota
23 that don't show any measurable effect. Right.

24 The Richter sale is the first one that I found
25 that shows that there is some influence. Just some

1 influence from how -- I would just say how it came about
2 and how the sale was managed.

3 And I tried to differentiate that in my further
4 investigation. Because when I first saw that I thought,
5 man, there's got to be some kind of motivating factor
6 here that's at play besides the wind towers. Because I
7 have all the sales data showing me something else. So
8 why do we have this one sale now showing something.

9 And through my investigation I just kept
10 interviewing and trying to figure out what was going on,
11 and the evidence was consistent that the sale fell
12 through from the disclosure of the wind tower.

13 Now I still think the timing of it was really
14 tough. The disclosure of deciding to disclose it right
15 after you receive an offer is very difficult.

16 COMMISSIONER FIEGEN: You know, I think
17 that's -- I also think that's South Dakota.

18 THE WITNESS: I agree. I believe -- when I
19 thought of that I thought, man, the broker had to have
20 mismanaged it. What were you doing disclosing it right
21 after you received the offer? You do that at the start
22 when you sign the listing. If you feel morally obligated
23 that's a material fact, put it on the disclosure.

24 And so I thought, okay, this sale has been
25 mismanaged, and that's the result of losing this buyer.

1 Because if this would have been presented properly, maybe
2 it wouldn't have been that big of a deal.

3 But when I interviewed the Richters -- I
4 e-mailed him so many times on this just to follow up with
5 questions, I'm on a first-name basis. I said, Why? Why
6 did you wait to time it right after you received the
7 offer? And I mentioned this earlier. He said, We
8 believed it was the right thing to do. So they felt
9 morally obligated to do it.

10 COMMISSIONER FIEGEN: Yeah. I think it's that
11 South Dakota nice. I really do.

12 THE WITNESS: Yeah. Yeah.

13 COMMISSIONER FIEGEN: I so appreciate your
14 detail. And unlike the Intervenors that said thank you
15 for your detail, it's uncomfortable when I sit up here
16 and hear a lot of assumptions and then I see your detail,
17 I very much appreciate that.

18 So you were in front of us the very first time,
19 and I can't remember which one it was, if it was Crocker,
20 Prairie -- no. Prevailing Winds, which one it was.

21 Anyway, you testified -- I think you testified
22 that you said it would take 12 months to 18 months really
23 or maybe even two years to really do a detailed study.
24 And you continued to add on to your study, which was
25 nice.

1 So this is probably more of a comment, but so
2 this area, this by Brookings and Watertown, if you were
3 to do this study 10 years from now, you would have all
4 sorts of information in your database.

5 THE WITNESS: Well, if sales transactions
6 occurred around the wind towers projects, yeah, we just
7 continually are monitoring it and establishing sales
8 transactions.

9 I have a number of market impact studies that
10 I've done. I'm not saying we're doing it with this one
11 but very interesting data like that that I started back
12 in 2008 on on an energy project, and I have been
13 continually updating sales transactions on that project
14 for this -- specifically, this kind of same methodology.

15 And it's very interesting to watch because the
16 consistency in the data and the trend that if you can
17 establish continually that we're seeing the same results
18 over and over and over again, even as time moves forward
19 or in this case as you're permitting more and more wind
20 towers around South Dakota, we're answering the
21 questions.

22 COMMISSIONER FIEGEN: I know. And I wish I had
23 that answer 10 years from now when I make this decision.
24 But I don't.

25 THE WITNESS: No. I understand.

1 COMMISSIONER FIEGEN: So thank you.

2 MS. CREMER: Staff, did you have any redirect?

3 MS. EDWARDS: Yes.

4 REDIRECT EXAMINATION

5 BY MS. EDWARDS:

6 Q. Mr. Lawrence, can you form an opinion on damage to
7 the Richter property, amount of damage?

8 A. Not at this time I would not be able to.

9 Q. Why not?

10 A. I believe that further analysis would need to be
11 made with the property in regards to a detailed site
12 inspection, and there would need to be an appraisal
13 established to provide a value opinion to the property as
14 of the effective date that it sold.

15 Q. Did you visit the Richter property?

16 A. Yes, I did.

17 Q. Did you note any other aspects that would go into
18 that analysis?

19 A. Aspects? Define aspects.

20 Q. Was there anything else in the area?

21 A. When I looked at the Richter sale and I visited the
22 property there were two things that came up in my mind at
23 the start when I investigated the property that I
24 thought -- that appeared to me that could be motivating
25 factors that could influence the selling price.

1 And that was I noticed that when I did the deeds
2 research at the county courthouse that there was a shared
3 driveway with the property. And then there was also a
4 cattle yard bordering the property to the west. So those
5 are the two things that I did notice.

6 MS. EDWARDS: No further questions. Thank you.

7 MS. CREMER: So that would bring us to recross
8 but only as to Commission questions. Or redirect.

9 And Crowned Ridge.

10 MR. MURPHY: Nothing. Thank you.

11 MS. CREMER: Mr. Swanson.

12 MR. SWANSON: Nothing for this gentleman.

13 MS. CREMER: Ms. Christenson.

14 MS. CHRISTENSON: I do have a couple.

15 RECROSS-EXAMINATION

16 BY MS. CHRISTENSON:

17 Q. When you talked about the shared driveway and the
18 cattle yard, those things didn't change from the time the
19 appraisal was made; right? Those would have been --
20 those would have been included on the original appraisal?

21 Those aren't new things added to the property. That
22 would be my question.

23 A. Okay. So I never completed an appraisal on that
24 property. My work went to completing a market analysis.

25 When I eventually looked at the property I testified

1 that I was trying to verify if there was other
2 contributing factors that could have affected the sale
3 price. Those are two things that I initially identified
4 were the shared driveway, which is not typical in the
5 market, and then the neighboring cattle yard. And I did
6 verify that just because those -- sometimes those
7 externalities can affect properties.

8 I did verify that the cattle yard was not in
9 operation or it was only seasonal. So from the older
10 aerials of Google Earth I looked at, it wasn't in full
11 operation at this time. And the shared driveway, when I
12 interviewed -- when I interviewed both buyers it was
13 never brought up about the shared driveway or the cattle
14 yard so I never considered it.

15 Q. Do you know when that appraisal was completed?

16 A. I'm trying to remember the exact date of the sale.
17 It was sometime -- it was around -- it would have to be
18 around the date of the sales transaction -- of the
19 \$275,000 transaction that occurred because it was
20 completed for bank financing.

21 So if you wanted to know approximate effective date
22 of value, I can look at my records. Or if you just
23 looked up the county records to see when the sale closed,
24 that's right around when the appraisal would have been
25 completed.

1 Q. I think that answers my question, that the appraisal
2 is recent and the driveway didn't look new to you because
3 it's a shared driveway.

4 A. No. It's just a gravel road.

5 Q. Okay. Another thing that you brought up were the
6 addition of more wind farms in the area. So, in your
7 opinion, the more wind farms being clustered in the
8 area -- like we have Crowned Ridge I is built right now.
9 We're adding Crowned Ridge II. We're getting Dakota
10 Range I, II, and III. We have Deuel Harvest. We have
11 Buffalo something. I mean, that whole area is going to
12 be clustered.

13 Do you foresee that being a market influence?

14 A. I wish I could answer that question at this time. I
15 would say it depends. Unfortunately, with what I can do
16 all I can do is look back in time, not forward. I think
17 that would go to something that Commissioner Fiegen and I
18 were kind of discussing about -- of what happens, you
19 know, across the landscape of South Dakota as we continue
20 to permit more and more of these towers of what could
21 happen, and I don't know the answer to that question.

22 Q. Okay. And then the properties that you did -- that
23 did sell that you said you talked -- and I'm not sure if
24 this one is in the redirect so you'll have to tell me.

25 The properties that sold that you said you talked to

1 the people that said they didn't like living by the
2 turbines, they didn't like the noise, sound, flicker, did
3 you talk to any of the new buyers -- the new owners
4 after they had moved into the property for any period of
5 time?

6 A. No, I did not. I just -- the party, the transaction
7 that I contacted was the seller on that one.

8 MS. CHRISTENSON: Okay. Thank you. That's all
9 I have.

10 MS. CREMER: Mr. Robish.

11 MR. ROBISH: I have nothing to add.

12 MS. CREMER: And then Staff, did you have any
13 final redirect?

14 MS. EDWARDS: No.

15 MS. CREMER: Thank you, Mr. Lawrence. You may
16 step down.

17 THE WITNESS: Thank you.

18 (The witness is excused.)

19 MS. CREMER: Staff, who is your next witness?

20 MS. EDWARDS: Our next witness was going to be
21 David Hessler. So he might be a long one.

22 MS. CREMER: There was some discussion -- people
23 wanting to be done closer to 5-ish, as we're moving along
24 quickly. So --

25 MS. EDWARDS: We have Ms. Meyer here too if that

1 would be quicker.

2 I'm sorry. Mrs. Morey.

3 (Discussion off the record.)

4 MS. EDWARDS: Staff calls David Hessler.

5 (The oath is administered by the court reporter.)

6 DIRECT EXAMINATION

7 BY MS. EDWARDS:

8 Q. Mr. Hessler, please state your full name and
9 business address for the record.

10 A. My name is David Hessler, and my address is
11 5096 North Silver Cloud Drive in St. George, Utah.

12 Q. And how are you employed?

13 A. I work for Hessler & Associates, which is a
14 family-run company of acoustical consultants.

15 Q. And what's your job title?

16 A. Vice president.

17 Q. As vice president of Hessler & Associates, what are
18 your job responsibilities?

19 A. Acoustical engineer, and we specialize exclusively
20 in power plants and the impact assessments, testing,
21 noise control, that sort of thing.

22 Q. How did you become involved in this docket?

23 A. I was retained by Staff to offer impartial technical
24 support. Not that you need it.

25 Q. Can you tell us generally what you reviewed or

1 analyzed in preparation for your testimony in this
2 hearing today?

3 A. Yes. I've reviewed the noise study submitted by the
4 Applicant and its subsequent revisions. Also the Direct
5 and Supplemental Testimony of the Applicant's consultants
6 relevant to noise, and also the Rebuttal Testimony of
7 those consultants, and also some of the NextEra folks on
8 noise.

9 Q. Do you see Staff Exhibit S2 there in front of you on
10 the table?

11 A. I do.

12 Q. Can you please identify that document.

13 A. That's my Direct Testimony.

14 Q. Do you have any additions, deletions, or corrections
15 to make to that testimony?

16 A. No.

17 Q. If I asked you the same questions as those posed in
18 your prefiled testimony today, would your answers be the
19 same?

20 A. Yes.

21 Q. At the time your testimony was filed was it true and
22 correct to the best of your knowledge?

23 A. Yes.

24 Q. And I'm also going to show you what has been marked
25 for identification purposes but is not in the record yet,

1 Exhibit S7.

2 Do you recognize that document?

3 A. Yes, I do.

4 Q. Can you turn to Condition 26 in that document,
5 please.

6 A. Okay.

7 Q. And have you had a chance to look at that proposed
8 condition?

9 A. Yes, I have.

10 Q. Does it incorporate the suggestions that you've made
11 to Crowned Ridge?

12 A. Yes, it does.

13 Q. And throughout this process, either on your own or
14 through Staff, have you had a chance to craft any other
15 mitigating measures?

16 A. In my Direct Testimony I was critical of the project
17 in the sense that there didn't seem to be a lot of effort
18 made to get the sound levels down, specifically at
19 nonparticipants. So I saw an opportunity to maybe
20 improve things a little bit.

21 There are -- there were six turbine sites that were
22 designated as alternates that were relatively remote from
23 nonparticipants compared to some other locations. And so
24 I gave a list of turbines that were, I considered, "bad
25 actors" and -- for their consideration to move some of

1 those turbines to these more remote, alternate locations.

2 And they did take me up on that, essentially, and
3 made four moves, moving four turbines to these more
4 isolated locations. Two of the alternates were not
5 practical to use.

6 MS. EDWARDS: Thank you.

7 I have no further questions and would tender
8 this witness for cross.

9 MS. CREMER: Thank you.

10 Crowned Ridge?

11 MR. MURPHY: No cross-examination.

12 MS. CREMER: Mr. Swanson.

13 CROSS-EXAMINATION

14 BY MR. SWANSON:

15 Q. Mr. Hessler, I represent a few of the Intervenor in
16 this case. I'm not sure if you were here or present for
17 their testimony, but it was mostly in written form.

18 I wanted to ask you just a few -- very few questions
19 about your Direct Testimony in S2. Page 3, line 10 where
20 you say the project layout -- I'm trying to quote here.
21 I believe this is a quote. "The project layout appears
22 to have been aggressively devised."

23 Could you explain that a bit further for me?

24 A. Yes. I've seen a lot of wind turbine site plans,
25 and this one struck me as being dense in the sense of

1 they're trying to put a lot of turbines into the project
2 area.

3 Q. And it still remains that way as the plan now
4 stands?

5 A. Yes.

6 Q. How could it be designed differently? Just a bigger
7 footprint and the turbines more spread out, I gather?

8 A. That would certainly be an advantage for noise.
9 There's a couple approaches. One is to expand the
10 project area out and reduce the density. But that's not
11 always an easy or open option.

12 There is also the possibility of using larger output
13 units and fewer of them. Because the sound of all
14 turbines in this general class is very similar. It's not
15 that you're getting a louder unit just because it's
16 putting out more megawatts. So that's one possibility.

17 But, you know, those options aren't very easy all
18 the time.

19 Q. Did the Applicant respond to your expressed concern
20 with any specific proposal or redesign concept?

21 A. Well, it did respond positively to my suggestion to
22 move units to these alternate locations.

23 Q. Even with that being done, would you still consider
24 it to be an aggressively devised or designed wind farm?

25 A. Yes. That hasn't changed.

1 Q. You note at page 4, line 22, that when you have --
2 and I think -- again, an exact quote from your statement.
3 When sound levels are higher than about 40 dBA annoyance
4 and complaints are more likely. Now that might be a
5 paraphrase from line -- page 4, line 22.

6 A. Well, that says something totally different here in
7 my copy.

8 Q. All right. Well, I want to be accurate so what --
9 that could have been a complete paraphrase. So what does
10 line 22 say?

11 A. It's the end of a long sentence that has nothing to
12 do with what you're asking.

13 Q. All right. Well, maybe I miswrote it.

14 Do you come to that conclusion anywhere in
15 Exhibit S2?

16 A. That conclusion being again?

17 Q. Well, that when you have sound levels higher than
18 about 40 dBA, that annoyance and complaints from property
19 owners and residents around the wind farm is a more
20 likely occurrence.

21 A. Yes. That's true.

22 Q. All right. You've written professionally about that
23 fact, have you not?

24 A. Yes.

25 Q. One of those would be the -- and I don't know

1 what -- I don't recall the title, but it's by your
2 authorship October of 2011, which was written for the
3 Minnesota Public Service Commission. I'm sure you know
4 exactly what I'm talking about.

5 A. Yes.

6 Q. It's an approximate 79-page article on noise
7 control.

8 A. Yeah. They asked -- the Minnesota Public Utilities
9 Commission asked for a Best Practices Guidelines.

10 Q. All right. And that's focused simply on sound and
11 wind farms. Am I correct?

12 A. That's correct.

13 Q. As part of that report, you concluded -- well, you
14 tell me. What were your general conclusions about noise
15 levels as an appropriate design level?

16 A. Well, what I have maintained for some time now, and
17 we're talking about 2011, since then, is that based on
18 our experience testing completed projects, we feel like
19 45 is a reasonable and fair noise limit as a regulatory
20 limit.

21 But we would hasten to add that if it's at all
22 possible to get lower than that and ideally to 40, that
23 it's definitely highly desirable.

24 Q. And so in your experience what sort of issues or
25 complaints are likely to arise if the wind farm is

1 designed for 45 dBA as opposed to 40, as an example?

2 A. I think what we've found from testing a number of
3 projects was that there was a likelihood of complaints at
4 somewhere -- 2 to 3 percent of all the folks that live
5 there. But once the level goes above 45, it's -- it goes
6 up exponentially.

7 Q. All right. You advised the Staff of this Commission
8 in the Prevailing Wind Park matter, did you not?

9 A. Yes.

10 Q. And that was -- I don't remember the docket number
11 of it. EL18-026?

12 A. I'm sure that's what it was.

13 Q. All right. And that was in an area of South Dakota
14 to the south central part of South Dakota, as I recall?

15 A. Yeah.

16 Q. And in that docket you recommended that the
17 Commission provide by final order or decision that the
18 wind farm observe 40 dBA at nonparticipating residences?

19 A. That's correct.

20 Q. Do you know if that wind farm's been built? Because
21 I don't know?

22 A. I don't know either.

23 Q. All right. You had no input on the shadow flicker
24 issues in Prevailing Park, did you?

25 A. No. I don't know anything about shadow flicker.

1 Q. Is your role here purely in advising Staff about the
2 design of Crowned Ridge's wind farm and the work product
3 assembled by their experts? Is that basically what
4 you're doing?

5 A. I've been asked to review the noise study for
6 adequacy, any things that I see wrong with it, that sort
7 of thing.

8 What I did find was that, as I mentioned, I would
9 have liked to have seen more effort made to get the sound
10 levels down. But there weren't a lot of options there.

11 Q. And by a lot of options, it would have required the
12 willingness to move turbines or delete turbines, perhaps?

13 A. Yeah. Because I -- you know, I would ideally like
14 to see 40 for all projects, but it's very, very rare that
15 that's a practical possibility. It was the case with
16 Prevailing Wind, and that Applicant was very
17 accommodating and moved things around and was able to
18 meet a 40 dBA regulatory limit.

19 But that's a very rare case. That was a much less
20 dense project and so on and so forth.

21 Here and really in every application what I'm
22 looking for is is there something that could be
23 reasonably done to significantly improve things? And the
24 only real option here was to make use of those alternate
25 sites.

1 Q. Okay. Are there any recommendations that you've
2 made that remain on the table that the Applicant hasn't
3 agreed to?

4 A. No.

5 Q. All right. What are the spikes in noise levels that
6 one might expect from a wind farm, assuming, as an
7 example, that 42 or 43 dBA has been predicted by the
8 sound experts?

9 A. In general, wind turbine noise is highly variable
10 all the time, due to turbulence in the wind, atmospheric
11 conditions, wind sheer, various things. A lot of times
12 the sound level will change in real time as you're
13 sitting listening to it.

14 What we found when we measure completed projects is
15 that you get a large data scatter for a given wind speed.
16 You'll get a lot of different sound levels. But the mean
17 level will be, oh, we've found right on the model
18 prediction. It's the mean level.

19 But there's going to be some fluctuations about
20 that. And it's typically, I would say, 5 -- plus or
21 minus 5 would be a good number.

22 Q. 5 dBA?

23 A. Yes.

24 Q. There was some discussion with witness Haley about
25 the use of ISO 9613-2 for sound propagation and

1 calculating attenuation, the G factor. And I know you're
2 well familiar with those.

3 Is snow cover of ground to -- of any depth, is that
4 typically something that a G factor of 0.5 would be
5 applicable?

6 A. A coefficient of .5 would actually be conservative
7 for winter conditions.

8 Q. Right.

9 A. Snow is usually at the top of the list of absorptive
10 ground surfaces. Specifically, fresh snow as a -- I
11 don't want to get too technical but flow resistivity.
12 That's how much it allows the sound to get into it and
13 kind of check in and not check out.

14 It's got -- snow has a low resistivity of about 10
15 to 30. I won't even get into the units that are used.
16 They're very esoteric. But a parking lot by comparison
17 would be a flow resistivity of about a million. So snow
18 is very absorptive. Also frozen granular snow is the
19 next thing on the list usually. So those sorts of things
20 would demand a coefficient close to 1.

21 Q. Okay. Frozen granular snow is in that category as
22 well?

23 A. Exactly. It's usually number two on the list.

24 Q. But ice is not?

25 A. If the snow were covered with a sheet of ice due to

1 sleet, under those specific circumstances it would be
2 more reflective.

3 Q. I think you've just described the typical snow that
4 I have at least on my farm.

5 A. If I can add to that, ground absorption is kind of a
6 peripheral effect. The sound from a wind turbine to some
7 point far away is 98 percent how far away it is and 1 or
8 2 percent everything else, including ground absorption.

9 That only has an effect around 250 hertz in the
10 frequency spectrum, and that is below the range where you
11 hear the whooshing sound. That's all a little bit higher
12 frequency. So the ground absorption doesn't really take
13 any of that away. So it's a very minor effect in the
14 first place.

15 Q. A very minor effect in the first place. So if we
16 were to deal with a wind turbine emitting noise at an 80
17 or 90 meter hub height --

18 A. Uh-huh.

19 Q. -- and we're dealing with receipt at a receptor, a
20 residence, which can look out the kitchen window and see
21 the turbine --

22 A. Uh-huh.

23 Q. There is a direct pulse of sound which goes from the
24 source to the receptor, which has no interference with
25 the ground at all; correct?

1 A. Yes. Ground effects would be the ground immediately
2 in front of the house there, in front of the window.
3 Usually it's divided into three areas, the area
4 immediately near the source, the intervening ground, the
5 area near the receiver. Most of the loss would come from
6 the sound reflecting off the ground near the receiver
7 point.

8 So it does occur. You wouldn't think that a high
9 source like that would be affected by the ground, but it
10 is. When you measure, what you see in the frequency
11 spectrum is always a dip at 250 hertz attributable to
12 this phenomenon.

13 Q. All right. Do you have any comments about the --
14 strike that.

15 The distance from my clients' homes to the closest
16 turbine in this case varies between roughly 1,976 feet
17 and 2,200 feet, in that range.

18 A. Okay.

19 Q. Does that strike you, based on your knowledge of
20 sound emission issues on a wind farm, as too close for
21 comfort?

22 A. No. No. 1,000 feet is too close for comfort.

23 Q. Well, that I would agree with you on.

24 All right. So when you say that the -- it is a --
25 an aggressively planned wind farm, the proximity from the

1 turbines to the residential homes, are you saying that
2 has really no factor? There's no factor in that?

3 A. Well, it's not just what the distances are. It's
4 how many turbines are around a particular house or a
5 point of interest. What's happening here is that
6 there's -- the density of turbines is such that there's a
7 lot of nonparticipating houses with predicted levels
8 above 40. At my last count I think it was approaching
9 100. It was a lot.

10 Q. Throughout the whole wind farm?

11 A. Yeah. Yeah. And I'd like to see a lot lower number
12 there.

13 Q. Was your work in October of 2011 intended to be
14 contributory, or was it contributory to what then became
15 the NARUC Best Practices Guideline or report that came
16 out in January of 2012?

17 A. Right. That was essentially a revision and
18 expansion of the Minnesota work for the National
19 Association of Regulatory Utility Commissioners.

20 Q. Is your work cited or relied on in the NARUC work,
21 if you know?

22 A. I wrote the report, the NARUC report.

23 Q. I'm referring, though, to the Tom Stanton report
24 that's called "Put It There," which is -- do you remember
25 that one?

1 A. Vaguely.

2 Q. All right.

3 A. Yeah. No. Not --

4 Q. Yeah. I'm talking about a report that came out
5 three months after your October of 2011 work.

6 A. Okay. All right.

7 Q. All right. And maybe you're not familiar with the
8 Tom Stanton author.

9 A. Well, that was eight years ago. I think I did read
10 it at the time, but now I forgot what it said.

11 Q. It's 186 pages so --

12 A. Yeah.

13 MR. SWANSON: All right. Mr. Hessler, thank you
14 so much. And I'll pass this witness.

15 MS. CREMER: Ms. Christenson.

16 CROSS-EXAMINATION

17 BY MS. CHRISTENSON:

18 Q. Hi, Mr. Hessler.

19 A. Hello.

20 Q. You're very familiar with the Shirley Wind Farm in
21 Brown County, Wisconsin; correct?

22 A. Yes.

23 Q. You did a study there; correct?

24 A. I participated in a joint study there, yeah.

25 Q. Yes. Can you tell us how many turbines are in that

1 Shirley Wind project?

2 A. I think it's only six or seven.

3 Q. Okay. Do you recall how many homes were abandoned
4 that prompted that study that you were a part of?

5 A. Three for sure. Might have been more.

6 Q. Thank you.

7 The Shirley Wind Farm project, was that eventually
8 declared a health hazard by the Wisconsin Board of
9 Health?

10 A. Yes, it was.

11 Q. Thank you. I'm trying not to ask you all the same
12 questions he did.

13 Your preferred design goal would be 40 dBA for this
14 project as well?

15 A. For all projects, yeah.

16 Q. Yes. I don't know if you heard the Applicant
17 testimony by Mark Thompson. I'm not sure if you did, but
18 I'll just kind of refresh if -- he said they could add
19 something called an enhanced power curve to feather the
20 blades on a turbine.

21 Are you familiar with an enhanced power curve?

22 A. Yes. I did read that in his Direct Testimony. It's
23 a new development that's supposed to give a 1 and a half
24 dB improvement.

25 Q. Had you heard of that before?

1 A. No.

2 Q. Okay. Crowned Ridge Wind II has committed to using
3 all low noise trailing edge blades in this project. And
4 my understanding from reading previous dockets, and I
5 believe you were a part of, that low noise trailing edge
6 blades reduce noise 2 to 3 dBA?

7 Does that sound correct?

8 A. That's what is claimed. I haven't gone and tested
9 it myself so I'm not real sure about that.

10 Q. So by adding those two things together, would it be
11 possible for Crowned Ridge Wind II by using your
12 suggestions to maybe get a little closer to the 40 dBA
13 design goal?

14 A. Well, actually they're not that far away from it.

15 Q. Okay.

16 A. Because the modeling adds in a 2 dB uncertainty
17 factor. And all that is is increasing the turbine level
18 by 2. It's lifting all the levels by 2.

19 And now the further commitment to use this EPCO
20 optimization essentially in theory reduces all levels by
21 3 and a half dB. Now almost all of the nonparticipants,
22 according to current modeling, are in the 40 to 43-ish
23 range. So by setting aside the safety factor in the
24 modeling and by using this EPCO, in effect, the actual
25 level should be around 40 or less for just about

1 everybody.

2 Q. So then your recommendation would be for the Staff
3 or Commission to maybe make that a condition to add that
4 to a turbine -- to the turbines to get that sound
5 reduced. Would that be a fair statement?

6 A. To use the EPCO --

7 Q. Yeah.

8 A. I think that's already been agreed to.

9 Q. Okay. Did Staff ask you to do any study in regard
10 to infrasound and/or low frequency noise for this
11 project?

12 A. They didn't ask me to do it, but I did talk about it
13 in my Direct Testimony.

14 Q. Okay. Not an actual study, just --

15 A. Oh, no. No study.

16 Q. You just discussed it?

17 A. I just discussed it.

18 MS. CHRISTENSON: That's all the questions I
19 have. Thank you.

20 THE WITNESS: All right.

21 MS. CREMER: Thank you.

22 Mr. Robish.

23 MR. ROBISH: Yeah. Al Robish.

24 CROSS-EXAMINATION

25

1 BY MR. ROBISH:

2 Q. Hi.

3 A. Hi there.

4 Q. You stated if you put bigger turbines, the noise is
5 kind of the same, but you put fewer of them. Would that
6 lower our dBA then for nonparticipators?

7 A. In theory, yes, if you used considerably fewer
8 turbines and sited them in an optimal way.

9 Q. Because they're really concentrated.

10 Amber just asked about infrasound. Do you do
11 infrasound testing?

12 A. Infrasound testing itself is extremely difficult to
13 do. It was done at the Shirley project we were just
14 talking about.

15 Q. Yeah.

16 A. And we had to bring in Dr. Walker who is an expert
17 in instrumentation to custom build a measurement system
18 to detect it. And it can't be measured with normal
19 instruments.

20 Q. Oh, okay. Yeah. I don't know how they do that.

21 A. Yeah. No. It's extremely difficult.

22 Q. Do you do sound studies just for wind projects? Do
23 you do anything for OSHA?

24 A. Do I do anything for OSHA? I do a lot of
25 measurements and so forth related to OSHA sound levels at

1 fossil fuel power plants.

2 Q. Okay. There we go.

3 A. Where the noise level is really high.

4 Q. Generators with motors on them? Engines on them?

5 A. Every -- gas turbines, diesels.

6 Q. Okay. 40 is highly desirable. Did you say that
7 40 dBA there was like 2 to 3 percent complaints?

8 A. For levels in between 40 and 45. I'd say 43, 44,
9 that sort of level. Below 40, complaints are extremely
10 rare.

11 Q. Oh, okay. 45, they go up quite a bit?

12 A. Yeah. The whole range of -- the whole spectrum of
13 the situation is basically from 40 to 50. 40 is almost
14 no impact, and 50 is definite impact.

15 Q. Oh. I was going to ask that. Okay. Thank you.

16 Do you do in-field studies or just sound modeling?

17 A. We do modeling, testing, design, every aspect of
18 power acoustics.

19 Q. After the project is finished if I wanted to hire
20 you to come out and do a sound study, do you do that?

21 A. Yes.

22 MR. ROBISH: Okay. Thank you very much.

23 THE WITNESS: You're welcome.

24 MS. CREMER: Thank you.

25 Chairman Hanson.

1 CHAIRMAN HANSON: Thank you for your testimony,
2 Mr. Hessler. I don't have any questions.

3 THE WITNESS: All right.

4 (Discussion off the record.)

5 COMMISSIONER NELSON: Okay. So I'm going to ask
6 the question that Chairman Hanson really wanted to ask.
7 What is the dBA level of a whooping crane?

8 You don't have to answer.

9 THE WITNESS: I don't have a clever retort.

10 COMMISSIONER NELSON: I do have one question.
11 In relation to Staff's proposed Exhibit S7, and you've
12 looked at Condition 26, does this deviate from what we
13 would have approved in our last docket, Tatanka, or any
14 of the other recent dockets? Do you know?

15 THE WITNESS: I believe this is substantially
16 similar to those in what's being required.

17 COMMISSIONER NELSON: So substantially similar
18 means there must be some difference. Can you tell me
19 what that is?

20 THE WITNESS: Each one evolves, and little
21 things are added and tweaked. This one has a test
22 protocol essentially built into it, which the other ones
23 may not have.

24 COMMISSIONER NELSON: But in your professional
25 opinion, this is a sound methodology -- sound.

1 This is a valid methodology for this type of
2 test?

3 THE WITNESS: Yes. This type of testing is
4 difficult to do for the simple reason you can't just walk
5 outside the front of the house and use a sound level
6 meter. You're going to be measuring everything going on,
7 not just the project.

8 And background noise is a major influence here.
9 It's comparable to the sound of the project itself. And
10 so it's a matter of trying to parse those apart and
11 figure out what the project is doing. That's the
12 difficulty.

13 This uses an on-and-off technique to compare and
14 so you're able to subtract out the background.

15 COMMISSIONER NELSON: Difficult. But something
16 that someone with your level of expertise could, in fact,
17 do and do accurately; correct?

18 THE WITNESS: Yes. Yes.

19 COMMISSIONER NELSON: Thank you.

20 COMMISSIONER FIEGEN: Thank you, Mr. Hessler,
21 for coming back to South Dakota. I think all three
22 Commissioners really enjoy reading your testimony. And
23 then really -- I certainly enjoy seeing what the
24 Applicant will do with your suggestions.

25 So this time you made suggestions on alternates,

1 and the Applicant again listened to your suggestions and
2 put it in the conditions. Would you agree?

3 THE WITNESS: Yeah.

4 COMMISSIONER FIEGEN: So I certainly appreciate
5 that.

6 You always teach us something. And sometimes
7 you're on the phone, and we don't get to see your
8 expression. But I want to go back to a statement you
9 made, and I think it was when A.J. was asking you some
10 questions.

11 And you went to this 98 percent is based on
12 distance. Because, you know, that word "distance" is
13 just one of mine today. And then you went to 1 to
14 2 percent is other stuff.

15 Am I assuming, because I have a little note
16 here, that other stuff is the ground factor of that 0 or
17 .5 or 1?

18 THE WITNESS: That's correct. The hemispherical
19 divergence of sound from the turbine rotor, that loss
20 with distance is almost all of the loss. There's just a
21 few other minor effects.

22 Ground absorption is the most significant of
23 them, but it's still small. It's only 1 or 2 dB at most.
24 And then there's atmospheric absorption, the high
25 frequencies get absorbed by the air. That's very minor.

1 But the big thing is just simply the distance,
2 and it's just simple law of physics how much the wave
3 front area expands with distance.

4 COMMISSIONER FIEGEN: So I want to go back to
5 this 1 to 2 percent of other stuff on the ground.
6 Because we've had a discussion about this in maybe
7 Crowned Ridge -- one of our past projects.

8 THE WITNESS: Right.

9 COMMISSIONER FIEGEN: And so there was a lot of
10 debate on the .5 or the .3 or 0. So did you just state
11 it makes a difference of 1 or 2 dBA when you change those
12 factors?

13 Because what I originally heard you say is that
14 1 to 2 percent, and 1 to 2 percent certainly would be
15 less than 2 dBA.

16 THE WITNESS: Yeah. That was more just to
17 illustrate the relative importance of distance versus
18 other atmospheric effects.

19 Yeah. The ground absorption effect is small,
20 but it's there. And what we've found is that when you go
21 out and test, you get the best agreement in -- all these
22 projects are out in rural settings essentially. You get
23 the best agreement by just using .5 to predict the level
24 and that will be the mean level that's actually measured
25 out there. That's been our experience anyway.

1 COMMISSIONER FIEGEN: Okay. So if there was a
2 big debate and you used just zero, it wouldn't make that
3 big of difference. Because yesterday certainly it was
4 asked of the Applicant why they chose .5, and they kind
5 of said that was a standard. It's an average. But if
6 they would use 0, it wouldn't make all that big of
7 difference?

8 THE WITNESS: No. It would make a small
9 difference, and it would end up overestimating.

10 COMMISSIONER FIEGEN: Right. Okay. I just --
11 you know, because we've talked a lot about ground and ice
12 and snow and absorption and grass and trees. So when you
13 brought that up I just wanted to make sure I understood
14 that a little bit more.

15 Thank you. I appreciate it.

16 THE WITNESS: You're welcome.

17 MS. CREMER: Staff, do you have any recross as
18 to Commission questions or redirect?

19 MS. EDWARDS: Yes.

20 REDIRECT EXAMINATION

21 BY MS. EDWARDS:

22 Q. Earlier you answered a question about the Shirley
23 Wind Farm. Do you recall that?

24 A. Yes.

25 Q. And you were asked, I believe it was by

1 Ms. Christenson, about it being declared a health hazard
2 by the Wisconsin Department of Health?

3 A. That's correct.

4 Q. And is that accurate, to the best of your knowledge,
5 is it was the Wisconsin Department of Health?

6 A. It may have been the Brown County Wisconsin
7 Department of whatever.

8 Q. Moving on, unless you want to talk more about
9 Shirley. We know you like it.

10 A. It comes up in every case.

11 Q. After your testimony today do you maintain your
12 recommendation to have a 45 dBA regulatory limit?

13 A. Yes.

14 Q. Okay. And also you were asked by Commissioner
15 Nelson about changes in the sound protocol conditions.
16 And for this question I'm going to ask you to turn to
17 your testimony, S2, and then Exhibit DMH-2.

18 And I apologize. Your copy is not in color so it
19 won't be as easy to read.

20 Darren has a copy.

21 A. I've got it here. It's gray. That's okay.

22 Q. Oh. So you can kind of tell --

23 A. I can tell.

24 Q. Can you tell us from that document what changes were
25 made from the sound protocol generally?

1 A. In general it was to consider Crowned Ridge I and
2 Crowned Ridge II as being essentially the same project
3 for sound testing purposes. And specifically when it
4 comes to doing the on-and-off test that I briefly alluded
5 to.

6 What you want to do there is measure the sound with
7 the project operating and then turn off all the turbines
8 within a mile of that location to get the background
9 under those exact wind conditions and everything else.

10 Now there may be a test position that's close to the
11 boundary between the two projects. So it will be
12 necessary to maybe perhaps turn off one of the -- or some
13 of the Crowned Ridge I units. Or units from the other
14 project, vice versa.

15 Q. So then is the intent of that condition to account
16 for cumulative impacts?

17 A. No. It's just to get a sensible reading of what the
18 background level is.

19 MS. EDWARDS: No further questions. Thank you.

20 CHAIRMAN HANSON: I simply need to ask a
21 question of did I hear correctly --

22 I think it was your first question when you
23 asked Mr. Hessler, Do you recommend a dBA -- did you say
24 45 or 40? I'm not sure what I heard.

25 MS. EDWARDS: My question was whether or not he

1 maintained his 45 dBA regulatory limit.

2 CHAIRMAN HANSON: Okay. Thank you.

3 COMMISSIONER FIEGEN: Off the record.

4 (Discussion off the record.)

5 MS. CREMER: Okay. Clearly that was redirect
6 by -- redirect by Staff. I keep losing my spot here.

7 So we will go to recross but only as to
8 Commission questions and redirect.

9 So Crowned Ridge.

10 MR. MURPHY: No questions.

11 MS. CREMER: Mr. Swanson.

12 MR. SWANSON: Nothing further.

13 MS. CREMER: Ms. Christenson.

14 MS. CHRISTENSON: No questions.

15 MS. CREMER: Mr. Robish.

16 MR. ROBISH: No questions.

17 MS. CREMER: All right. Thank you, Mr. Hessler.
18 You may step down.

19 THE WITNESS: You're welcome.

20 (The witness is excused.)

21 (Discussion off the record.)

22 MS. CREMER: So we will be in recess until 8:30
23 tomorrow morning. Thank you.

24 (The hearing is in recess at 5:12 p.m.)

25

1 STATE OF SOUTH DAKOTA)

2 :SS

CERTIFICATE

3 COUNTY OF SULLY)

4

5 I, CHERI MCCOMSEY WITTLER, a Registered
6 Professional Reporter, Certified Realtime Reporter and
7 Notary Public in and for the State of South Dakota:

8 DO HEREBY CERTIFY that as the duly-appointed
9 shorthand reporter, I took in shorthand the proceedings
10 had in the above-entitled matter on the 5th day of
11 February, 2020, and that the attached is a true and
12 correct transcription of the proceedings so taken.

13 Dated at Onida, South Dakota this 25th day of
14 February, 2020.

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/s/ Cheri McComsey Wittler
Cheri McComsey Wittler,
Notary Public and
Registered Professional Reporter
Certified Realtime Reporter

\$	287:23, 292:20, 298:11, 298:13, 308:23, 309:4, 310:15, 320:22, 332:5, 334:2, 341:3, 346:22, 382:18, 383:24, 383:25, 463:24, 470:15, 488:3, 488:23, 497:19, 504:14	482:17 163rd [1] - 284:5 17 [3] - 264:14, 264:15, 264:16 170 [1] - 253:18 17192 [1] - 439:13 171st [2] - 383:18, 383:21 173 [1] - 253:19 17539 [1] - 424:4 18 [2] - 260:22, 487:22 186 [1] - 508:11 19 [3] - 273:21, 273:24, 475:3 19-003 [1] - 285:9 194 [1] - 253:19 196 [1] - 253:20 1973 [1] - 392:12 1990s [1] - 348:19 1999 [2] - 348:20, 429:4	361:10, 363:25, 376:9, 397:18, 475:2, 476:24 200 [7] - 259:3, 259:8, 259:9, 274:13, 275:14, 308:15, 427:23 200,000 [1] - 471:24 2000 [1] - 304:24 2001 [1] - 376:5 2002 [3] - 348:14, 364:3, 364:5 2003 [1] - 376:5 2007 [1] - 390:7 2008 [1] - 488:12 201 [1] - 253:20 2010 [3] - 346:10, 350:19, 390:23 2011 [10] - 320:11, 346:2, 346:10, 347:17, 347:18, 365:14, 500:2, 500:17, 507:13, 508:5 2012 [2] - 345:21, 507:16 2013 [4] - 326:5, 326:11, 326:15, 474:15 2014 [1] - 390:25 2016 [4] - 326:16, 333:12, 357:9, 467:9 2016-01C [1] - 260:4 2017 [3] - 382:16, 382:23, 383:7 2018 [8] - 326:16, 382:23, 455:12, 460:8, 466:25, 474:6, 477:22, 478:1 2019 [11] - 302:2, 322:14, 334:9, 347:3, 376:7, 376:10, 393:13, 467:2, 467:9, 473:17 2020 [8] - 251:8, 252:4, 302:3, 334:11, 376:11, 454:22, 522:11, 522:14 21 [1] - 376:7 213 [2] - 251:25, 253:21 215 [1] - 254:4 22 [6] - 274:3, 392:12, 393:16, 499:1, 499:5, 499:10 22-10 [1] - 419:10 220 [1] - 254:4 227 [1] - 254:5 23 [8] - 273:22,	273:24, 303:7, 390:24, 390:25, 392:12, 393:16, 454:22 230 [1] - 474:2 24 [1] - 412:19 24-7 [1] - 436:20 243 [1] - 254:5 25 [8] - 285:10, 285:16, 397:18, 412:19, 436:24, 467:23, 470:21, 476:24 25-year [1] - 403:18 250 [2] - 505:9, 506:11 251-522 [1] - 251:9 25th [1] - 522:13 26 [7] - 266:13, 295:17, 295:21, 390:7, 475:2, 496:4, 514:12 262 [1] - 254:6 263 [1] - 254:6 275 [1] - 254:7 277 [1] - 254:7 28 [1] - 334:9 283 [1] - 254:8 29 [2] - 253:4, 431:7 292 [1] - 254:8 294 [1] - 254:9
'	'16 [1] - 426:2 '17 [1] - 426:3 '97 [1] - 348:19 '99 [1] - 424:12			
/				
/s [1] - 522:17				
0	0 [4] - 308:20, 516:16, 517:10, 518:6 0.2 [1] - 391:24 0.5 [2] - 269:7, 504:4			
1	1 [29] - 257:3, 260:13, 261:3, 261:4, 261:7, 261:7, 261:8, 261:8, 261:9, 360:6, 364:16, 374:23, 377:20, 390:13, 416:10, 416:14, 416:15, 418:11, 504:20, 505:7, 509:23, 516:13, 516:17, 516:23, 517:5, 517:11, 517:14 1,000 [6] - 303:18, 304:4, 304:13, 304:17, 435:18, 506:22 1,200 [1] - 326:14 1,238 [1] - 326:11 1,500 [2] - 304:24, 465:24 1,700 [4] - 272:21, 336:13, 371:12, 372:21 1,976 [1] - 506:16 1-1 [1] - 261:8 1-26 [1] - 414:7 1-26-19 [1] - 414:9 1-4 [1] - 261:9 1.1 [2] - 366:9, 366:22 1.27 [1] - 384:13 10 [24] - 287:22,	10-meter-by-10-meter [1] - 289:22 100 [9] - 259:4, 265:22, 274:14, 334:20, 361:1, 387:14, 387:19, 427:23, 507:9 100s [1] - 328:20 104 [1] - 253:7 105 [1] - 253:8 10:00 [1] - 316:8 10:15 [1] - 320:23 10th [1] - 323:7 11 [3] - 332:6, 416:4, 418:11 11.3 [1] - 386:20 11.3.1.3.1 [1] - 386:23 111 [1] - 253:10 113 [1] - 253:10 114 [1] - 253:11 12 [4] - 270:4, 347:3, 378:7, 487:22 126 [1] - 253:11 128 [1] - 253:12 13 [6] - 276:2, 348:14, 469:22, 477:18, 477:19, 482:17 131 [1] - 253:14 134 [1] - 276:1 135 [2] - 389:13, 389:16 136 [1] - 253:14 14 [3] - 257:3, 259:11, 416:25 140 [1] - 253:15 146 [1] - 253:15 15 [7] - 301:20, 334:21, 417:1, 456:2, 475:3, 477:15, 485:22 150 [1] - 253:16 150,000 [1] - 471:23 152 [1] - 253:16 157 [2] - 296:11, 296:13 157th [1] - 284:5 16 [8] - 375:23, 455:17, 455:18, 456:2, 460:22, 477:19, 478:10,	2 2 [33] - 260:13, 264:16, 273:7, 273:11, 273:21, 291:12, 291:14, 293:20, 293:23, 297:20, 297:25, 318:8, 318:10, 319:3, 319:4, 319:6, 319:8, 353:17, 442:14, 501:4, 505:8, 510:6, 510:16, 510:18, 513:7, 516:14, 516:23, 517:5, 517:11, 517:14, 517:15 2,200 [1] - 506:17 2,211 [2] - 427:22, 428:8 2-10 [1] - 261:7 2-15 [1] - 260:12 2-16 [1] - 261:8 2-2 [1] - 261:7 2.1 [3] - 298:8, 298:25, 299:6 2.1-116-80 [1] - 259:11 2.3-116-90m [1] - 259:11 20 [24] - 264:14, 265:20, 266:3, 273:6, 285:10, 303:22, 303:24, 304:6, 312:1, 312:2, 312:13, 312:16, 313:4, 322:14, 325:7, 333:23, 343:20, 345:3,	273:24, 303:7, 390:24, 390:25, 392:12, 393:16, 454:22 230 [1] - 474:2 24 [1] - 412:19 24-7 [1] - 436:20 243 [1] - 254:5 25 [8] - 285:10, 285:16, 397:18, 412:19, 436:24, 467:23, 470:21, 476:24 25-year [1] - 403:18 250 [2] - 505:9, 506:11 251-522 [1] - 251:9 25th [1] - 522:13 26 [7] - 266:13, 295:17, 295:21, 390:7, 475:2, 496:4, 514:12 262 [1] - 254:6 263 [1] - 254:6 275 [1] - 254:7 277 [1] - 254:7 28 [1] - 334:9 283 [1] - 254:8 29 [2] - 253:4, 431:7 292 [1] - 254:8 294 [1] - 254:9
				3
				3 [27] - 264:19, 265:1, 266:11, 285:12, 287:20, 297:24, 297:25, 298:7, 303:6, 306:5, 308:20, 309:4, 309:17, 377:21, 399:24, 416:10, 416:14, 416:15, 418:11, 425:5, 425:11, 497:19, 501:4, 510:6, 510:21, 513:7, 517:10 3,900 [1] - 427:24 3-0 [1] - 422:4 3-2 [1] - 261:3 3-8 [1] - 261:4 3.1 [1] - 387:2 30 [49] - 263:11, 263:13, 265:2, 266:13, 266:15, 266:17, 266:18, 267:12, 274:7, 287:17, 287:23, 311:3, 311:5, 311:7, 312:16, 312:17,

329:12, 330:7, 334:25, 348:11, 349:20, 349:22, 350:10, 350:14, 350:25, 351:22, 353:4, 353:24, 354:11, 355:3, 359:9, 359:13, 359:25, 360:3, 360:4, 360:15, 360:23, 362:14, 362:18, 363:8, 367:7, 370:16, 370:18, 393:25, 444:14, 467:6, 473:17, 473:22, 504:15 30-hour [6] - 274:1, 280:6, 341:7, 341:15, 364:3, 367:4 30-hour-per-year [1] - 347:5 30-minute [2] - 364:3, 367:4 30-year [1] - 369:7 300 [3] - 265:11, 274:1, 485:8 300-megawatt [1] - 274:13 301 [1] - 254:11 302 [1] - 254:11 313 [1] - 254:12 315 [1] - 254:12 316 [1] - 254:13 32 [7] - 253:4, 264:18, 264:19, 274:3, 298:19, 431:7 320,000 [2] - 485:9, 485:19 321 [1] - 254:15 324 [1] - 254:15 326 [1] - 254:16 333 [1] - 254:18 337 [1] - 254:18 35 [4] - 267:4, 267:12, 311:4, 311:7 355 [1] - 254:19 36 [2] - 428:8, 431:7 367 [1] - 254:19 369 [1] - 254:20 371 [1] - 254:20 375 [1] - 255:4 378 [1] - 255:4 38 [1] - 265:20 388 [1] - 255:5 395 [1] - 255:5 3:15 [1] - 446:6	4 4 [8] - 285:5, 412:19, 415:23, 416:25, 418:10, 425:5, 499:1, 499:5 4.2 [2] - 352:6, 362:5 40 [37] - 266:13, 266:15, 266:17, 266:18, 266:25, 287:17, 287:23, 288:1, 308:13, 308:16, 308:17, 309:7, 309:15, 309:16, 311:5, 312:17, 351:17, 499:3, 499:18, 500:22, 501:1, 501:18, 502:14, 502:18, 507:8, 509:13, 510:12, 510:22, 510:25, 513:6, 513:7, 513:8, 513:9, 513:13, 520:24 40.5 [1] - 442:17 407 [1] - 255:7 42 [2] - 266:25, 503:7 42-by-75 [1] - 429:7 42.5 [1] - 442:17 423 [1] - 255:11 429 [1] - 255:11 43 [3] - 288:2, 503:7, 513:8 43-ish [1] - 510:22 430 [1] - 255:12 431 [1] - 255:12 439 [1] - 255:14 44 [2] - 308:16, 513:8 44.5 [4] - 308:11, 308:13, 308:17, 309:7 442 [1] - 255:15 446 [1] - 255:17 45 [24] - 266:25, 267:4, 290:22, 298:18, 298:20, 299:7, 335:1, 351:17, 368:24, 369:8, 369:17, 374:9, 419:6, 419:7, 444:15, 500:19, 501:1, 501:5, 513:8, 513:11, 519:12, 520:24, 521:1 450 [1] - 255:17 452 [1] - 255:21 459 [1] - 255:21 46 [2] - 253:5, 327:20 463 [1] - 255:22	468th [1] - 424:4 469 [1] - 255:22 469th [1] - 439:13 4820 [1] - 452:13 489 [1] - 255:23 490 [1] - 255:23 494 [1] - 256:4 497 [1] - 256:4 5 5 [18] - 251:8, 276:2, 383:24, 389:13, 389:16, 389:21, 390:23, 416:8, 416:13, 418:11, 503:20, 503:21, 503:22, 504:6, 516:17, 517:10, 517:23, 518:4 5-ish [1] - 493:23 50 [7] - 272:8, 299:7, 335:3, 351:16, 392:5, 513:13, 513:14 508 [1] - 256:5 5096 [1] - 494:11 511 [1] - 256:5 514 [1] - 256:6 518 [1] - 256:6 523 [1] - 252:3 53 [1] - 390:18 533 [1] - 384:1 534 [1] - 256:8 537 [1] - 256:9 539 [1] - 256:11 542 [1] - 256:11 549 [1] - 256:12 550 [1] - 256:14 560 [1] - 256:14 58 [3] - 386:24, 440:7, 441:7 580 [2] - 256:15, 383:25 590 [2] - 383:17, 383:25 5:12 [1] - 521:24 5th [3] - 252:4, 452:13, 522:10 6 6 [18] - 260:22, 264:16, 273:11, 276:1, 287:18, 308:22, 309:4, 349:11, 364:10, 364:23, 415:24, 467:10, 470:6, 470:22, 473:15, 473:21,	475:8 6.26 [1] - 470:23 60 [10] - 312:1, 312:2, 312:14, 360:14, 362:16, 363:8, 363:13, 363:16, 440:8, 441:7 60,000 [2] - 366:4, 366:19 600 [1] - 399:24 608 [1] - 256:15 616 [1] - 256:16 63 [1] - 296:10 64 [1] - 383:17 68 [2] - 296:11, 296:12 7 7 [7] - 351:25, 352:4, 352:6, 352:16, 352:21, 364:23, 415:24 7(c) [1] - 390:14 700 [1] - 465:24 72 [1] - 276:2 73 [1] - 253:5 74 [1] - 253:6 77 [6] - 264:18, 265:1, 265:4, 275:7, 276:2, 276:8 79-page [1] - 500:6 8 8 [8] - 266:3, 302:3, 334:11, 346:22, 376:11, 416:3, 418:10, 452:13 80 [3] - 282:22, 288:1, 505:16 800 [4] - 366:20, 382:7, 382:9, 465:24 80s [1] - 328:8 81 [1] - 253:6 85 [1] - 331:8 8:30 [3] - 251:8, 252:5, 521:22 9 9 [4] - 302:2, 362:5, 376:7, 456:3 90 [3] - 282:22, 301:22, 505:17 90s [2] - 328:8, 328:20 94 [1] - 276:1 95 [2] - 392:7, 399:18 9613-2 [2] - 283:2, 503:25 97 [1] - 276:1 98 [3] - 253:7, 505:7,	516:11 A A.J [3] - 251:18, 431:25, 516:9 A.J.'s [1] - 273:15 a.m [2] - 251:8, 252:5 A1 [1] - 257:3 A1-A [1] - 257:3 A1-B [7] - 257:4, 389:8, 389:10, 389:12, 389:13, 389:18, 389:19 A1-C [1] - 257:5 A1-D [1] - 257:5 A1-E [1] - 257:6 A1-F [1] - 257:6 A1-G [1] - 257:7 A1-H [1] - 257:8 A1-I [1] - 257:8 A1-J [1] - 257:9 A1-K [1] - 257:9 A1-L [1] - 257:10 A1-M [1] - 257:10 A1-N [1] - 257:11 A1-O [1] - 257:11 A10 [1] - 257:21 A11 [1] - 257:22 A12 [4] - 257:23, 334:9, 340:19, 345:13 A12-1 [2] - 257:23, 334:9 A12-10 [5] - 258:14, 362:25, 363:1, 363:20, 370:25 A12-11 [1] - 258:16 A12-12 [1] - 258:17 A12-13 [1] - 258:18 A12-14 [1] - 258:19 A12-15 [1] - 258:20 A12-16 [5] - 258:21, 334:10, 346:14, 348:13, 348:24 A12-2 [1] - 258:3 A12-3 [1] - 258:4 A12-4 [1] - 258:5 A12-5 [1] - 258:7 A12-6 [1] - 258:8 A12-7 [1] - 258:10 A12-8 [1] - 258:12 A12-9 [1] - 258:13 A13 [1] - 258:22 A13-1 [1] - 258:23 A13-2 [1] - 259:3 A13-3 [1] - 259:4 A14 [3] - 259:5, 273:13, 273:14 A14-1 [2] - 259:6,
---	---	---	--	---

294:25 A14-2 [1] - 259:7 A14-3 [1] - 259:8 A14-4 [1] - 259:9 A15 [1] - 259:12 A16 [1] - 259:12 A16-1 [1] - 259:13 A17 [2] - 259:13, 322:14 A17-1 [2] - 259:14, 322:14 A17-2 [1] - 259:14 A17-3 [1] - 259:15 A17-4 [1] - 259:15 A17-5 [1] - 259:17 A17-6 [1] - 259:18 A17-7 [1] - 259:19 A17-8 [1] - 322:15 A18 [2] - 259:20, 376:10 A18-1 [2] - 259:21, 376:10 A18-2 [2] - 259:23, 376:10 A19 [1] - 260:3 A19-1 [1] - 260:3 A19-2 [1] - 260:4 A19-3 [1] - 260:4 A19-4 [1] - 260:5 A2 [1] - 257:12 A20 [2] - 260:6, 334:11 A21 [1] - 260:6 A21-1 [1] - 260:7 A21-2 [1] - 260:8 A21-3 [1] - 260:9 A22 [1] - 260:10 A23 [2] - 260:10, 302:4 A24 [3] - 260:11, 376:12, 385:14 A25 [1] - 260:11 A26 [1] - 260:12 A27 [2] - 260:12, 440:12 A27-1 [1] - 260:13 A27-2 [3] - 260:13, 378:23, 440:12 A3 [2] - 257:12, 376:8 A4 [1] - 257:13 A4-1 [1] - 257:13 A5 [1] - 257:14 A5-1 [1] - 257:14 A6 [1] - 257:15 A6-1 [1] - 257:15 A6-2 [1] - 257:16 A7 [4] - 257:16, 302:2, 303:6, 306:5 A7-1 [2] - 257:17, 302:2 A7-2 [1] - 257:17	A7-3 [2] - 257:18, 302:3 A8 [1] - 257:19 A9 [1] - 257:20 abandoned [2] - 365:12, 509:3 ability [8] - 335:13, 339:10, 373:4, 421:6, 423:13, 451:9, 466:3, 480:5 able [19] - 271:2, 293:10, 295:9, 304:4, 347:11, 356:14, 358:13, 411:10, 419:11, 460:15, 464:4, 466:4, 466:8, 469:22, 475:20, 475:23, 489:8, 502:17, 515:14 abounding [1] - 379:17 above-entitled [2] - 252:2, 522:10 absence [1] - 330:1 absolute [1] - 419:8 absolutely [3] - 263:18, 408:21, 446:5 absorb [3] - 268:1, 268:23, 268:24 absorbant [1] - 281:23 absorbed [2] - 282:25, 516:25 absorbing [4] - 268:4, 268:9, 282:2, 288:6 absorbs [2] - 267:24, 268:18 absorption [11] - 282:9, 282:19, 283:8, 288:4, 505:5, 505:8, 505:12, 516:22, 516:24, 517:19, 518:12 absorptive [3] - 288:10, 504:9, 504:18 AC-1 [1] - 260:21 AC-10 [1] - 261:6 AC-11 [1] - 261:7 AC-12 [1] - 261:7 AC-13 [1] - 261:8 AC-14 [1] - 261:8 AC-15 [1] - 261:9 AC-2 [1] - 260:22 AC-3 [1] - 260:23 AC-4 [1] - 260:23 AC-5 [1] - 261:3 AC-6 [1] - 261:3 AC-7 [1] - 261:4	AC-8 [1] - 261:4 AC-9 [1] - 261:5 accept [2] - 278:12, 411:1 accepting [1] - 340:5 access [2] - 311:18, 312:8 accessory [1] - 290:22 accommodating [2] - 468:18, 502:17 accompanies [1] - 347:8 accordance [1] - 390:13 according [5] - 314:16, 364:7, 392:22, 398:8, 510:22 accordingly [1] - 422:10 account [3] - 371:5, 380:10, 520:15 Account [1] - 258:11 accounted [1] - 319:7 accumulative [1] - 285:22 accurate [5] - 269:13, 295:4, 315:22, 499:8, 519:4 accurately [1] - 515:17 acknowledge [2] - 462:2, 484:7 acoustic [1] - 377:18 Acoustic [1] - 257:5 acoustical [6] - 285:16, 286:10, 305:15, 367:22, 494:14, 494:19 acoustics [3] - 301:8, 301:12, 513:18 acquisition [1] - 448:25 acreages [4] - 473:25, 482:22, 483:12, 484:1 act [1] - 459:15 Act [2] - 377:2, 390:14 actigraphy [1] - 327:15 activity [2] - 310:4, 434:22 actors [1] - 496:25 actual [15] - 267:6, 295:22, 348:11, 349:15, 350:11, 351:23, 353:14, 354:4, 354:25, 356:18, 358:2, 359:14, 363:25,	510:24, 511:14 actuals [1] - 296:2 Adam [4] - 251:14, 425:18, 426:7, 426:9 add [10] - 280:2, 319:8, 427:14, 439:23, 487:24, 493:11, 500:21, 505:5, 509:18, 511:3 added [3] - 287:25, 490:21, 514:21 adding [3] - 298:15, 492:9, 510:10 addition [5] - 334:1, 336:22, 401:2, 424:18, 492:6 additional [9] - 326:22, 401:18, 403:17, 403:20, 427:6, 457:18, 458:15, 458:22, 478:8 additionally [2] - 385:17, 393:14 additions [5] - 425:7, 439:21, 454:1, 455:1, 495:14 address [9] - 274:15, 322:1, 388:14, 409:15, 424:3, 452:12, 468:3, 494:9, 494:10 addressed [3] - 327:4, 329:21, 329:25 addresses [1] - 464:3 addressing [1] - 395:1 adds [1] - 510:16 adequacy [1] - 502:6 adequate [1] - 445:14 adequately [1] - 417:10 adhere [1] - 376:22 adjacent [2] - 386:18, 434:23 adjunct [1] - 333:25 adjust [1] - 320:19 Adjustment [2] - 412:21, 433:11 administered [8] - 300:25, 321:16, 333:1, 375:4, 423:22, 439:6, 452:7, 494:5 admissible [2] - 410:7, 414:10 admit [1] - 471:8 admitted [1] - 414:12 adopt [3] - 350:13, 350:24, 351:19 adopted [11] - 348:7,	348:20, 350:6, 350:10, 351:12, 351:14, 353:23, 354:10, 355:3, 370:14, 397:4 adopting [2] - 350:22, 359:13 adoption [2] - 302:13, 355:5 adult [2] - 377:16, 411:9 advantage [1] - 498:8 adverse [7] - 323:4, 324:17, 368:19, 412:22, 443:10, 451:11, 470:7 adversely [1] - 443:1 advice [3] - 301:15, 425:16, 438:12 advised [4] - 410:4, 417:7, 417:16, 501:7 advising [2] - 418:21, 502:1 advisor [2] - 438:16, 452:18 aerial [8] - 407:17, 407:19, 408:1, 408:4, 408:20, 461:13, 464:5, 464:8 aerials [1] - 491:10 affect [6] - 328:25, 345:6, 421:4, 435:8, 480:23, 491:7 affected [7] - 265:18, 286:2, 292:21, 299:1, 457:15, 491:2, 506:9 affects [1] - 475:7 Affidavit [14] - 257:21, 260:16, 260:17, 260:18, 260:18, 412:15, 413:16, 413:17, 415:14, 416:8, 418:10, 425:10, 430:13, 441:10 affidavits [4] - 410:2, 410:10, 410:14, 411:1 Affidavits [1] - 257:22 afford [1] - 287:13 afternoon [6] - 378:20, 378:21, 396:21, 396:22, 469:12, 469:13 age [1] - 411:9 agencies [5] - 377:4, 377:9, 393:10, 402:21, 463:9 Agency [1] - 257:4
---	---	---	--	--

agency [4] - 343:12, 389:20, 393:8, 412:20 agent [5] - 426:9, 438:6, 438:9, 438:11, 438:18 Aggregate [1] - 258:9 aggressively [3] - 497:22, 498:24, 506:25 ago [4] - 314:22, 347:15, 459:7, 508:9 agree [24] - 279:1, 283:1, 284:9, 306:12, 349:24, 372:1, 388:6, 388:12, 388:13, 392:1, 398:4, 402:2, 404:2, 404:6, 412:25, 414:7, 414:18, 415:7, 415:10, 423:16, 445:9, 486:18, 506:23, 516:2 agreed [4] - 411:17, 478:25, 503:3, 511:8 agreement [19] - 302:15, 415:6, 415:24, 438:13, 447:3, 447:17, 447:23, 448:11, 448:15, 449:15, 449:16, 449:17, 449:19, 449:20, 449:21, 449:23, 451:1, 517:21, 517:23 Agreement [2] - 258:23, 260:16 agreements [9] - 444:8, 444:16, 446:20, 446:24, 448:20, 449:7, 449:11, 449:12, 450:2 agrees [1] - 279:20 agricultural [1] - 478:2 agriculture [1] - 393:1 ahead [3] - 313:20, 450:14, 463:15 ahold [1] - 457:6 AIG [1] - 453:3 AIG-RR [1] - 453:3 AIGR [1] - 453:2 AIGR-SS [1] - 453:2 air [12] - 288:23, 306:21, 307:7, 307:17, 308:3, 314:16, 314:18,	356:12, 432:10, 434:20, 444:14, 516:25 aircraft [1] - 399:5 airplanes [1] - 328:7 al [1] - 393:4 Al [2] - 292:10, 511:23 albeit [1] - 342:1 align [1] - 335:3 Allen [1] - 251:21 allow [4] - 310:8, 354:3, 386:21, 416:20 allowed [3] - 414:10, 437:2, 443:16 allows [1] - 504:12 alluded [1] - 520:4 almost [7] - 344:12, 382:18, 398:15, 428:1, 510:21, 513:13, 516:20 Alt [3] - 264:19, 265:1, 276:2 alternate [8] - 274:9, 275:8, 276:1, 276:7, 276:8, 497:1, 498:22, 502:24 Alternate [1] - 260:5 alternates [5] - 276:2, 276:4, 496:22, 497:4, 515:25 alternative [1] - 275:14 alternatives [1] - 274:15 Amanda [1] - 251:23 amazing [1] - 469:23 amber [1] - 512:10 Amber [1] - 251:20 ambient [5] - 266:14, 267:10, 311:25, 371:5, 371:16 amenable [1] - 444:15 amended [1] - 390:14 Amendment [1] - 412:3 amendment [1] - 412:4 America [1] - 400:2 American [2] - 411:25, 412:3 amount [13] - 265:13, 271:19, 318:15, 343:10, 359:18, 360:5, 360:21, 408:11, 435:3, 435:10, 435:11, 477:24, 489:7 AMY [2] - 255:13, 439:11	Amy [6] - 260:18, 439:5, 439:11, 439:12, 439:15, 442:22 analyses [1] - 376:19 analysis [23] - 269:2, 269:3, 327:18, 328:10, 357:24, 452:20, 454:3, 454:9, 455:19, 455:20, 455:22, 456:1, 457:21, 459:21, 460:11, 462:10, 462:14, 462:17, 462:20, 470:11, 489:10, 489:18, 490:24 Analysis [2] - 259:13, 260:21 analyze [1] - 466:5 analyzed [1] - 495:1 AND [1] - 251:5 Andrew [1] - 333:6 anecdotal [1] - 482:20 animals [3] - 358:21, 385:8, 385:12 Annoyance [4] - 258:7, 258:9, 258:14, 336:11 annoyance [43] - 299:24, 300:3, 300:10, 323:12, 324:6, 324:8, 324:11, 324:13, 329:18, 335:7, 335:10, 335:11, 335:17, 335:19, 335:23, 336:6, 336:15, 336:19, 337:1, 341:22, 342:13, 342:18, 342:21, 355:14, 359:15, 360:2, 360:5, 360:19, 360:24, 363:22, 365:23, 368:15, 371:1, 371:10, 372:7, 372:24, 372:25, 373:4, 373:12, 374:4, 374:11, 499:3, 499:18 annoyed [14] - 278:20, 305:24, 323:14, 335:21, 342:16, 366:1, 368:14, 372:2, 372:14, 372:16, 372:17, 372:18, 374:1	annoying [4] - 323:3, 329:16, 330:3, 330:9 annual [2] - 274:2, 451:4 annually [1] - 394:9 ANSI [2] - 316:25, 317:7 answer [37] - 269:21, 275:11, 275:12, 283:12, 285:17, 300:6, 311:6, 313:24, 319:13, 320:12, 354:21, 357:5, 358:21, 364:23, 366:2, 381:1, 384:8, 400:17, 418:13, 434:8, 444:21, 445:7, 445:8, 450:22, 450:24, 472:5, 477:5, 480:2, 480:4, 480:16, 481:4, 482:2, 488:23, 492:14, 492:21, 514:8 answered [7] - 444:21, 445:4, 445:11, 445:19, 450:5, 458:7, 518:22 answering [3] - 319:12, 474:16, 488:20 answers [9] - 316:11, 317:15, 402:19, 415:20, 427:25, 454:12, 484:20, 492:1, 495:18 anthropology [1] - 376:4 anticipated [2] - 397:10, 479:13 anyway [4] - 286:11, 446:2, 487:21, 517:25 apart [3] - 287:8, 341:19, 515:10 Apex [1] - 334:5 apologize [8] - 352:9, 355:21, 358:25, 362:2, 390:24, 405:25, 476:22, 519:18 appealing [1] - 327:8 appear [1] - 271:19 appearance [2] - 424:22, 439:15 appeared [3] - 269:23, 359:5, 489:24 appearing [6] - 251:17, 251:19,	251:20, 251:22, 251:23, 357:10 Appendix [15] - 257:3, 257:4, 257:5, 257:5, 257:6, 257:6, 257:7, 257:8, 257:8, 257:9, 257:9, 257:10, 257:10, 257:11, 257:11 applaud [1] - 420:3 apples [4] - 291:2, 291:5 apples-to-apples [2] - 291:2, 291:5 applicable [2] - 296:5, 504:5 Applicant [12] - 347:4, 409:16, 414:7, 434:17, 495:4, 498:19, 502:16, 503:2, 509:16, 515:24, 516:1, 518:4 Applicant's [7] - 260:23, 261:3, 261:4, 261:5, 261:8, 416:19, 495:5 APPLICANTS [7] - 253:2, 254:2, 255:2, 257:2, 258:2, 259:2, 260:2 application [4] - 407:17, 407:20, 408:4, 502:21 Application [29] - 257:3, 257:20, 260:17, 262:3, 281:9, 290:21, 375:19, 377:11, 380:21, 383:6, 383:19, 386:19, 386:24, 387:16, 387:18, 388:18, 389:3, 389:12, 391:15, 394:3, 395:10, 396:7, 396:15, 397:16, 397:20, 398:25, 400:9, 400:12, 427:4 APPLICATION [1] - 251:4 applicators [3] - 407:19, 408:2, 408:20 applied [2] - 291:17, 291:21 apply [1] - 457:25 appointed [1] - 522:8 apportioning [1] - 354:12 Appraisal [1] - 452:25
---	---	---	---	--

appraisal ^[16] - 453:10, 459:19, 459:21, 459:24, 460:5, 485:7, 485:8, 485:12, 485:18, 489:12, 490:19, 490:20, 490:23, 491:15, 491:24, 492:1 appraiser ^[5] - 452:16, 460:1, 460:5, 469:18, 480:3 appreciate ^[18] - 326:3, 330:12, 345:7, 406:17, 406:23, 420:2, 426:16, 427:17, 433:21, 437:3, 469:1, 478:12, 482:3, 482:11, 487:13, 487:17, 516:4, 518:15 appreciates ^[1] - 475:2 appreciating ^[1] - 432:5 appreciation ^[9] - 467:10, 470:22, 473:16, 473:21, 475:7, 475:11, 475:14, 475:17, 476:2 approach ^[7] - 269:24, 269:25, 270:5, 318:12, 328:18, 394:12, 408:7 approaches ^[1] - 498:9 approaching ^[1] - 507:8 appropriate ^[1] - 500:15 approve ^[1] - 412:22 approved ^[2] - 424:15, 514:13 approximate ^[2] - 491:21, 500:6 April ^[1] - 383:7 Aquatic ^[1] - 257:5 aquifers ^[1] - 387:19 Archaeological ^[1] - 259:21 archeology ^[2] - 376:4, 398:24 Architectural ^[1] - 259:23 area ^[74] - 266:15, 267:11, 283:25, 284:4, 284:7, 284:15, 284:21,	285:6, 295:10, 296:21, 310:3, 311:1, 311:12, 338:8, 338:16, 339:14, 356:22, 365:2, 379:2, 379:15, 379:20, 379:22, 379:24, 380:1, 380:12, 381:5, 381:7, 381:10, 382:1, 382:5, 382:7, 382:9, 386:18, 387:2, 387:10, 390:12, 390:16, 391:7, 391:9, 391:12, 391:25, 392:5, 392:12, 393:17, 401:21, 424:11, 429:15, 460:21, 460:25, 463:9, 463:13, 465:13, 472:1, 472:23, 473:7, 474:14, 477:16, 482:25, 483:12, 484:3, 484:12, 484:17, 488:2, 489:20, 492:6, 492:8, 492:11, 498:2, 498:10, 501:13, 506:3, 506:5, 517:3 areas ^[24] - 269:24, 278:6, 371:5, 371:6, 371:16, 379:17, 380:5, 380:6, 380:10, 380:17, 380:18, 380:22, 380:24, 382:4, 385:20, 386:8, 387:19, 402:25, 403:4, 418:16, 455:25, 466:10, 466:17, 506:3 argued ^[1] - 415:11 argument ^[2] - 373:13, 409:23 arguments ^[1] - 415:13 arise ^[1] - 500:25 Arkansas ^[1] - 399:2 arms ^[2] - 412:4, 475:1 arms-length ^[1] - 475:1 array ^[6] - 259:3, 379:1, 379:7, 381:1, 427:23 Array ^[1] - 259:22 arrayed ^[2] - 278:9, 278:18	arsonic ^[2] - 356:12, 356:19 article ^[5] - 302:25, 319:23, 353:17, 466:2, 500:6 aside ^[2] - 329:18, 510:23 aspect ^[1] - 513:17 aspects ^[6] - 306:6, 323:10, 375:24, 489:17, 489:19 assaulted ^[1] - 433:13 assembled ^[1] - 502:3 Assess ^[1] - 258:22 assessment ^[6] - 377:18, 388:20, 391:14, 391:16, 401:24 Assessment ^[3] - 257:6, 258:13, 259:24 assessments ^[4] - 301:21, 375:18, 377:16, 494:20 assigned ^[1] - 291:7 assistance ^[1] - 410:14 associate ^[3] - 293:10, 301:7, 301:11 associated ^[7] - 313:1, 322:2, 322:25, 327:5, 332:11, 332:12, 336:23 associates ^[1] - 301:6 Associates ^[3] - 301:11, 494:13, 494:17 association ^[2] - 453:6, 507:19 Association ^[1] - 258:8 assume ^[11] - 263:24, 269:8, 272:19, 278:2, 280:17, 298:23, 341:8, 353:17, 408:10, 408:14, 419:5 assumed ^[2] - 273:17, 381:17 assumes ^[2] - 264:6, 339:21 assuming ^[6] - 293:22, 318:17, 339:17, 460:5, 503:6, 516:15 assumption ^[1] - 307:4 assumptions ^[3] - 269:12, 485:7,	487:16 assuring ^[1] - 318:13 astronomical ^[2] - 353:24, 354:12 astronomically ^[1] - 353:6 atmosphere ^[1] - 271:9 atmospheric ^[3] - 503:10, 516:24, 517:18 attached ^[2] - 326:10, 522:11 Attachment ^[9] - 260:13, 260:13, 261:3, 261:4, 261:7, 261:7, 261:8, 261:8, 261:9 attachment ^[1] - 454:8 attempting ^[1] - 305:19 attempts ^[2] - 343:13, 398:16 attended ^[1] - 367:21 attention ^[6] - 295:15, 363:19, 424:20, 427:1, 453:19, 454:15 attenuation ^[11] - 269:7, 282:25, 283:8, 287:2, 288:17, 295:19, 295:21, 296:3, 296:4, 298:1, 504:1 attitude ^[4] - 335:14, 372:19, 373:6, 373:15 attitudes ^[2] - 323:9, 337:1 attorney ^[7] - 410:4, 410:22, 414:21, 430:11, 433:15, 480:15 attorney's ^[1] - 414:22 attributable ^[3] - 434:22, 475:18, 506:11 attributed ^[2] - 372:7, 473:23 audibility ^[5] - 303:24, 305:18, 305:19, 308:5, 317:7 Audible ^[1] - 258:10 audible ^[9] - 303:17, 304:2, 304:3, 304:10, 304:14, 307:15, 307:24, 329:4, 385:11 audio ^[1] - 434:19 author ^[2] - 303:2,	508:8 authority ^[3] - 383:13, 398:21, 412:22 authorize ^[1] - 419:6 authorized ^[2] - 398:25, 419:12 authorship ^[1] - 500:2 autistic ^[1] - 294:5 automatically ^[1] - 263:24 automobiles ^[2] - 353:10, 353:12 availability ^[1] - 484:2 available ^[5] - 391:17, 415:8, 443:21, 463:8, 482:10 Avangrid ^[1] - 334:6 Avenue ^[2] - 252:3, 439:13 avenue ^[1] - 424:4 avenues ^[1] - 421:11 average ^[2] - 336:15, 518:5 Avian ^[2] - 257:8, 383:6 avian ^[7] - 377:13, 377:14, 382:4, 382:16, 382:17, 394:4, 401:2 avoid ^[3] - 316:2, 378:10, 385:18 avoidance ^[2] - 377:9, 377:24 avoided ^[1] - 379:24 avoiding ^[2] - 378:4, 378:5 aware ^[14] - 279:19, 291:16, 292:2, 326:17, 327:1, 327:21, 349:3, 358:16, 386:16, 392:14, 399:15, 399:23, 399:25, 481:21 aye ^[3] - 421:24, 422:1, 422:3
B				
B2004-01-23B ^[1] - 260:3 Bach ^[2] - 328:15, 328:16 bachelor ^[1] - 333:20 bachelor's ^[2] - 322:5, 376:3 Bachelor's ^[1] - 301:24 background ^[15] - 299:10, 309:25,				

310:3, 310:6, 310:16, 310:17, 310:25, 311:10, 398:24, 452:22, 453:9, 515:8, 515:14, 520:8, 520:18 bad [2] - 286:4, 496:24 bank [2] - 485:18, 491:20 Base [1] - 258:21 base [1] - 347:4 baseball [1] - 469:11 Based [3] - 258:10, 376:24, 380:12 based [23] - 272:20, 274:17, 280:9, 281:15, 283:3, 290:21, 291:11, 293:18, 322:21, 337:25, 349:4, 353:16, 354:8, 354:11, 356:4, 370:4, 386:10, 451:13, 461:9, 483:16, 500:17, 506:19, 516:11 basins [1] - 378:3 basis [9] - 268:6, 281:8, 281:18, 308:14, 308:18, 353:6, 356:9, 419:9, 487:5 Bat [2] - 257:5, 257:6 bat [4] - 377:18, 420:4, 420:5 Baucom [1] - 251:15 Beacon [2] - 463:22, 464:4 bear [3] - 364:11, 412:4, 424:17 bears [1] - 471:5 beat [1] - 290:23 beautiful [1] - 289:8 became [2] - 481:21, 507:14 become [5] - 315:12, 315:16, 329:12, 361:18, 494:22 becomes [4] - 310:12, 315:15, 315:23, 315:24 becoming [1] - 350:18 BEFORE [1] - 251:10 Before-After [1] - 258:5 began [2] - 333:11, 348:15 begin [1] - 409:12 begins [3] - 349:15,	352:3, 416:14 behalf [11] - 251:17, 251:19, 251:23, 318:6, 359:11, 406:10, 406:13, 409:22, 427:2, 427:3, 438:6 behind [1] - 378:22 belief [2] - 369:17, 417:8 beliefs [1] - 411:21 bell [2] - 324:22, 388:10 belong [1] - 415:13 below [10] - 299:4, 299:7, 303:22, 304:6, 315:11, 318:24, 368:24, 387:14, 505:10, 513:9 belt [1] - 428:9 Bemis [1] - 431:4 benefit [1] - 373:8 benefits [1] - 323:10 Berkeley [3] - 336:3, 368:11, 372:12 beside [1] - 404:24 Best [3] - 345:21, 345:25, 346:6 best [15] - 332:4, 351:2, 351:8, 351:14, 351:21, 378:9, 433:25, 454:24, 480:4, 495:22, 500:9, 507:15, 517:21, 517:23, 519:4 bet [3] - 295:1, 436:9, 481:4 better [2] - 296:8, 366:15 between [20] - 266:13, 271:5, 271:25, 282:20, 284:11, 285:22, 288:18, 289:9, 289:12, 291:6, 299:14, 307:23, 309:5, 309:7, 359:24, 399:24, 461:7, 506:16, 513:8, 520:11 Between [1] - 258:8 beyond [22] - 272:14, 272:18, 285:18, 291:14, 292:5, 293:23, 303:24, 338:6, 349:21, 350:20, 360:25, 395:12, 397:22,	403:19, 403:24, 403:25, 404:1, 422:23, 432:23, 433:17, 443:13 bidding [1] - 477:8 big [8] - 270:19, 289:7, 338:4, 487:2, 517:1, 518:2, 518:3, 518:6 bigger [2] - 498:6, 512:4 biggest [2] - 263:14, 372:24 bioavailability [1] - 356:19 biological [1] - 405:15 biologists [2] - 382:6, 400:8 biology [1] - 333:20 bird [1] - 381:25 birds [4] - 381:9, 382:8, 382:12, 392:19 Bismarck [2] - 375:10, 400:24 bit [16] - 268:11, 270:21, 286:14, 303:3, 314:22, 379:11, 404:24, 414:14, 421:19, 425:15, 463:16, 496:20, 497:23, 505:11, 513:11, 518:14 BK [1] - 460:20 black [1] - 296:25 blackbirds [1] - 405:6 blade [5] - 271:15, 272:20, 358:13, 358:18, 366:9 blades [12] - 271:12, 277:4, 343:17, 358:3, 358:8, 358:9, 358:11, 358:20, 366:14, 509:20, 510:3, 510:6 blinking [1] - 372:17 block [3] - 271:17, 271:20, 271:24 blockage [1] - 278:14 blue [1] - 379:9 Board [3] - 412:21, 433:11, 509:8 body [2] - 342:12, 368:5 book [1] - 273:19 border [1] - 467:22 bordering [1] - 490:4 Boston [1] - 321:23 bother [1] - 477:14 bothered [2] - 307:1,	307:6 bothering [1] - 307:11 boughten [1] - 427:19 boundaries [5] - 306:11, 307:19, 320:8, 413:4 boundary [2] - 297:20, 520:11 brain [2] - 262:23, 286:16 break [5] - 281:7, 320:23, 361:22, 446:2, 446:5 BREF [1] - 258:13 Brian [1] - 251:17 brief [5] - 330:19, 415:12, 415:13, 421:19, 459:17 briefly [5] - 415:5, 452:21, 453:7, 455:8, 520:4 briefs [1] - 411:15 Brigham [2] - 321:22, 376:4 bright [1] - 270:18 bring [9] - 264:25, 271:22, 422:8, 423:7, 442:4, 474:17, 482:10, 490:7, 512:16 bringing [1] - 420:18 brings [2] - 469:3, 471:1 broad [1] - 411:3 broader [1] - 311:24 broker [3] - 469:19, 475:16, 486:19 brokers [7] - 457:11, 463:9, 479:21, 479:22, 480:10, 480:16, 483:10 Brookings [29] - 455:13, 460:21, 460:24, 461:12, 463:7, 463:17, 463:22, 464:11, 465:13, 466:19, 466:24, 467:18, 467:20, 467:21, 468:1, 473:24, 478:6, 482:15, 482:17, 482:18, 482:21, 482:22, 482:25, 483:19, 483:21, 484:3, 484:7, 484:8, 488:2 brother [1] - 411:18 brought [9] - 290:4, 331:13, 331:14, 462:13, 479:19,	479:22, 491:13, 492:5, 518:13 Brown [4] - 260:22, 365:5, 508:21, 519:6 buffalo [1] - 492:11 Buffalo [3] - 460:21, 460:24, 472:23 buffer [2] - 284:23, 284:24 build [6] - 275:13, 284:23, 287:9, 320:15, 381:2, 512:17 Building [1] - 252:3 building [5] - 278:22, 338:16, 359:2, 429:7, 429:10 buildings [3] - 278:5, 278:19, 287:11 built [9] - 274:10, 275:7, 276:8, 292:2, 335:16, 368:1, 492:8, 501:20, 514:22 bulb [4] - 263:8, 271:16, 271:20, 271:24 bulk [2] - 368:22, 424:24 bumping [1] - 316:8 bunch [1] - 363:5 burdening [1] - 361:6 business [8] - 301:3, 321:19, 333:4, 375:7, 426:8, 452:12, 452:24, 494:9 busy [1] - 343:18 button [1] - 446:14 buy [2] - 287:13, 481:1 buyer [13] - 456:21, 457:9, 462:11, 462:22, 471:13, 477:9, 480:18, 480:23, 481:8, 481:23, 484:11, 484:16, 486:25 buyers [11] - 470:25, 471:2, 476:13, 477:1, 477:3, 477:7, 483:7, 483:10, 483:14, 491:12, 493:3 buying [1] - 475:22 BY [37] - 251:4, 262:16, 275:5, 277:20, 283:19, 292:12, 294:23, 301:2, 302:23, 313:22, 315:7,
--	--	---	--	---

321:18, 324:2, 333:3, 337:13, 340:17, 355:20, 367:14, 369:24, 375:6, 378:19, 388:4, 423:24, 429:3, 430:24, 439:8, 446:12, 452:9, 459:6, 463:6, 489:5, 490:16, 494:7, 497:14, 508:17, 512:1, 518:21	Case ^[1] - 259:9 case ^[49] - 259:10, 262:7, 271:7, 274:4, 276:21, 281:1, 293:20, 305:17, 307:10, 320:6, 322:1, 322:22, 346:25, 353:24, 354:12, 356:13, 375:1, 391:19, 392:1, 406:10, 406:25, 407:10, 412:1, 412:9, 412:10, 413:17, 419:13, 422:8, 427:8, 430:14, 443:12, 443:19, 444:9, 444:12, 447:19, 452:2, 459:7, 459:8, 459:13, 459:14, 481:10, 488:19, 497:16, 502:15, 502:19, 506:16, 519:10 cast ^[7] - 338:8, 339:16, 339:17, 343:3, 344:9, 344:25, 413:7 casting ^[2] - 344:14, 366:13 casts ^[1] - 342:8 catch ^[2] - 267:23, 297:13 category ^[2] - 308:19, 504:21 cathedral ^[1] - 289:7 cattle ^[5] - 490:4, 490:18, 491:5, 491:8, 491:13 caused ^[5] - 361:17, 365:19, 424:23, 439:16, 481:13 causing ^[1] - 373:4 cave ^[1] - 429:8 caveat ^[1] - 414:9 CD-2 ^[2] - 455:6, 456:12 cedar ^[1] - 429:10 ceiling ^[1] - 289:7 center ^[3] - 322:10, 383:22, 383:23 Center ^[1] - 252:3 central ^[1] - 501:14 certain ^[11] - 318:15, 327:6, 331:16, 402:7, 409:22, 425:5, 425:12, 427:6, 442:16, 470:2, 477:24	certainly ^[34] - 268:24, 270:2, 309:7, 324:16, 325:12, 327:3, 328:2, 328:8, 328:21, 329:14, 329:21, 330:2, 331:3, 355:10, 356:9, 357:3, 357:9, 359:5, 360:17, 361:23, 366:21, 369:14, 369:16, 373:17, 374:11, 395:23, 396:1, 403:16, 485:4, 498:8, 515:23, 516:4, 517:14, 518:3 certainty ^[1] - 310:20 CERTIFICATE ^[1] - 522:2 certified ^[2] - 452:15, 452:17 Certified ^[2] - 522:6, 522:19 CERTIFY ^[1] - 522:8 cetera ^[1] - 352:3 Chair ^[3] - 406:10, 431:11, 442:9 Chairman ^[9] - 281:22, 310:24, 325:24, 331:13, 396:20, 417:24, 421:25, 513:25, 514:6 CHAIRMAN ^[111] - 251:11, 251:11, 266:9, 266:11, 266:24, 267:7, 267:10, 267:13, 267:18, 267:21, 268:1, 268:5, 268:20, 269:1, 269:9, 269:15, 269:23, 270:7, 270:11, 271:1, 271:11, 271:21, 272:4, 272:23, 316:10, 316:15, 316:17, 317:15, 317:23, 318:5, 318:8, 318:19, 319:1, 319:12, 325:25, 326:2, 326:9, 326:17, 326:25, 327:21, 328:1, 328:11, 328:24, 329:6, 371:24, 372:1, 372:5, 373:13, 374:13, 396:21, 396:23, 396:25,	397:3, 397:8, 397:13, 397:17, 397:21, 397:25, 398:3, 398:10, 398:20, 399:1, 399:10, 399:14, 399:20, 399:25, 400:4, 400:15, 401:1, 401:10, 401:14, 402:1, 403:8, 403:15, 404:10, 404:18, 405:21, 406:19, 406:22, 417:25, 421:2, 421:10, 421:14, 422:1, 423:11, 423:18, 431:12, 432:15, 432:20, 433:5, 433:7, 433:17, 433:20, 442:10, 442:13, 442:20, 444:24, 469:11, 469:14, 469:25, 471:16, 474:24, 475:20, 476:5, 476:21, 476:23, 477:17, 478:12, 514:1, 520:20, 521:2 chairperson ^[1] - 469:8 challenge ^[3] - 315:25, 413:2, 419:9 challenged ^[2] - 419:4, 419:14 challenges ^[3] - 327:2, 327:23, 433:21 challenging ^[1] - 419:21 chance ^[7] - 347:12, 382:13, 403:13, 434:7, 459:17, 496:7, 496:14 Change ^[1] - 259:5 change ^[13] - 336:21, 344:22, 393:3, 398:4, 398:8, 401:8, 401:11, 403:13, 403:16, 421:5, 490:18, 503:12, 517:11 changed ^[6] - 276:19, 290:15, 392:16, 417:15, 466:11, 498:25 changes ^[14] - 291:16, 292:3, 302:6, 322:17, 333:14, 334:13, 364:17,	376:14, 401:1, 403:12, 425:7, 439:21, 519:15, 519:24 changing ^[1] - 342:2 chapter ^[1] - 419:10 characterization ^[1] - 267:2 characterize ^[3] - 342:18, 345:11, 365:25 chart ^[1] - 312:8 chat ^[1] - 433:23 check ^[3] - 346:1, 504:13 chemical ^[2] - 322:5, 356:7 Cheri ^[6] - 251:24, 331:22, 362:12, 432:4, 522:17, 522:18 CHERI ^[1] - 522:5 Chicago ^[1] - 322:10 chief ^[1] - 443:19 child ^[1] - 294:5 children ^[1] - 436:12 chose ^[2] - 430:13, 518:4 Chris ^[1] - 257:23 CHRIS ^[1] - 251:11 Christenson ^[32] - 251:20, 253:5, 253:7, 253:11, 253:15, 253:19, 254:5, 254:8, 254:12, 254:15, 254:19, 255:4, 255:11, 255:22, 255:23, 256:5, 256:15, 270:7, 283:15, 313:14, 323:25, 355:18, 378:17, 414:1, 429:1, 441:18, 452:1, 463:2, 490:13, 508:15, 519:1, 521:13 CHRISTENSON ^[32] - 283:16, 283:19, 292:8, 313:16, 313:18, 313:22, 314:25, 324:2, 325:16, 354:18, 355:20, 361:24, 367:9, 378:19, 381:21, 381:23, 384:4, 387:20, 429:3, 430:7, 430:15, 441:19, 441:24, 463:3,
C				
calculate ^[1] - 272:14 calculating ^[4] - 289:24, 338:7, 504:1 calculation ^[2] - 272:17, 461:9 calculations ^[2] - 284:13, 284:25 calendar ^[5] - 349:20, 349:22, 353:5, 353:19, 354:25 calibrations ^[1] - 315:23 calm ^[1] - 313:7 Canada ^[21] - 326:13, 326:23, 327:4, 327:9, 327:18, 328:9, 331:14, 331:15, 332:3, 333:21, 333:23, 342:19, 350:12, 355:4, 359:22, 361:13, 368:7, 369:2, 373:2, 391:21, 399:4 canceled ^[2] - 456:21, 457:10 candid ^[1] - 330:5 cannot ^[4] - 396:6, 409:24, 430:6, 430:14 Capitol ^[1] - 252:3 captured ^[1] - 465:12 car ^[1] - 344:5 care ^[7] - 280:17, 405:10, 407:6, 428:3, 428:4, 428:5 careful ^[1] - 429:20 carried ^[2] - 326:4, 326:11 cars ^[3] - 279:8, 279:14, 345:9 cascade ^[1] - 369:3 cascading ^[2] - 363:10, 374:9				

463:6, 468:7, 490:14, 490:16, 493:8, 508:17, 511:18, 521:14 CHRISTENSON'S [2] - 260:20, 261:2 Christenson's [2] - 260:23, 389:8 Christopher [2] - 260:6, 333:6 CHRISTOPHER [1] - 254:17 circulate [1] - 423:15 circumstances [4] - 324:11, 425:16, 440:24, 505:1 cited [3] - 345:24, 346:5, 507:20 citizen [1] - 412:3 citizens [3] - 411:25, 412:8 city [4] - 373:23, 466:19, 467:17, 484:10 Civil [3] - 414:8, 414:11, 414:16 claim [1] - 410:24 claimed [1] - 510:8 clarification [1] - 275:3 clarified [2] - 285:11, 331:23 clarify [16] - 262:8, 262:11, 273:23, 330:20, 331:11, 332:2, 347:19, 351:5, 367:2, 388:12, 444:4, 444:5, 444:7, 459:23, 477:21, 483:4 clarifying [1] - 283:17 class [2] - 459:15, 498:14 Classification [2] - 323:6, 324:20 Clean [1] - 377:2 clean [2] - 423:12, 469:10 clear [8] - 270:17, 275:20, 276:14, 299:13, 327:24, 395:6, 406:18, 418:13 cleared [1] - 380:22 clearest [1] - 309:2 clearly [7] - 335:8, 366:3, 406:17, 409:23, 411:20, 418:17, 521:5	clever [1] - 514:9 client [1] - 445:25 clients [3] - 281:12, 308:9, 420:17 clients' [1] - 506:15 climate [4] - 392:25, 401:5, 403:13, 403:15 close [20] - 271:12, 279:11, 283:23, 310:7, 312:4, 312:6, 324:24, 344:24, 347:23, 366:10, 384:6, 413:15, 426:13, 440:5, 467:6, 467:22, 504:20, 506:20, 506:22, 520:10 closed [2] - 465:7, 491:23 closer [12] - 266:17, 267:8, 267:9, 271:22, 363:16, 379:12, 393:15, 472:25, 483:7, 493:23, 510:12 closest [12] - 283:24, 284:11, 297:21, 297:22, 305:13, 383:11, 383:17, 386:25, 392:11, 393:15, 506:15 closing [1] - 467:2 cloud [1] - 494:11 clue [2] - 364:9, 410:5 clustered [2] - 492:7, 492:12 co [1] - 303:2 Co [3] - 259:11, 260:3, 260:4 co-author [1] - 303:2 CO-S-1 [1] - 257:23 CO-S-10 [1] - 258:14 CO-S-11 [1] - 258:16 CO-S-12 [1] - 258:17 CO-S-13 [1] - 258:18 CO-S-14 [1] - 258:19 CO-S-15 [1] - 258:20 CO-S-16 [2] - 258:21, 345:14 CO-S-2 [1] - 258:3 CO-S-3 [1] - 258:4 CO-S-4 [1] - 258:5 CO-S-5 [1] - 258:7 CO-S-6 [1] - 258:8 CO-S-7 [1] - 258:10 CO-S-8 [1] - 258:12 CO-S-9 [1] - 258:13 coal [1] - 373:20 Coast [1] - 398:14	coauthored [2] - 316:17, 319:16 code [1] - 324:19 coded [1] - 323:4 codified [1] - 348:4 CODINGTON [1] - 251:5 Codington [7] - 259:6, 259:7, 259:11, 262:5, 291:18, 292:4, 350:9 coefficient [2] - 504:6, 504:20 coherent [1] - 418:6 coincident [1] - 289:13 cold [2] - 315:15, 316:1 colleagues [2] - 328:18, 336:5 collect [1] - 310:6 collected [1] - 314:8 College [1] - 301:24 college [1] - 333:23 color [3] - 296:23, 440:11, 519:18 Colorado [1] - 398:16 combination [6] - 280:14, 282:8, 282:20, 298:9, 378:2, 380:8 combine [3] - 298:4, 298:14, 315:21 combined [2] - 291:22, 291:25 combining [2] - 283:11, 309:18 comfort [2] - 506:21, 506:22 comfortable [2] - 363:14, 417:18 coming [18] - 263:14, 272:25, 278:2, 291:5, 296:7, 307:6, 310:10, 335:15, 338:19, 339:11, 358:18, 407:15, 431:22, 433:22, 442:11, 482:8, 482:11, 515:21 comma [1] - 374:15 commencing [1] - 252:5 comment [6] - 331:22, 415:11, 462:21, 462:23, 482:18, 488:1 commentary [1] - 448:3 comments [9] -	330:19, 413:15, 467:4, 467:11, 471:12, 473:14, 474:21, 483:11, 506:13 commercial [1] - 453:11 COMMISSION [3] - 251:1, 251:10, 251:13 commission [1] - 349:3 Commission [35] - 263:2, 296:2, 316:7, 335:25, 337:3, 354:10, 357:13, 359:20, 369:15, 394:14, 395:20, 396:4, 396:10, 406:16, 407:8, 411:13, 412:21, 414:9, 415:15, 418:21, 418:24, 421:22, 427:10, 443:16, 453:14, 480:9, 480:13, 490:8, 500:3, 500:9, 501:7, 501:17, 511:3, 518:18, 521:8 Commission's [1] - 363:19 Commissioner [54] - 253:6, 253:12, 253:16, 253:20, 254:6, 254:13, 254:16, 254:20, 255:5, 255:7, 255:12, 255:15, 255:17, 255:22, 256:6, 256:9, 256:11, 256:16, 263:3, 266:7, 272:24, 275:6, 371:21, 371:25, 384:4, 395:21, 396:2, 416:12, 417:22, 418:2, 420:14, 420:24, 420:25, 421:23, 422:2, 422:21, 431:17, 433:9, 433:13, 433:20, 434:3, 434:10, 437:25, 442:4, 442:7, 450:10, 450:13, 450:20, 451:13, 469:3, 469:5, 482:16, 492:17, 519:14 COMMISSIONER [152]	- 251:12, 263:4, 263:17, 263:22, 264:8, 264:10, 264:12, 265:5, 265:8, 265:15, 265:24, 266:5, 272:25, 273:5, 273:9, 273:14, 273:17, 273:21, 274:8, 274:20, 275:17, 297:17, 297:23, 298:6, 298:21, 299:5, 299:11, 299:17, 299:20, 300:3, 300:8, 300:14, 317:22, 319:15, 319:19, 319:24, 320:9, 320:13, 320:20, 329:8, 329:10, 329:17, 330:12, 330:17, 331:1, 331:10, 331:20, 332:1, 332:16, 336:8, 340:11, 340:13, 371:22, 371:23, 395:22, 396:19, 397:2, 404:12, 407:14, 408:16, 408:25, 415:17, 416:7, 416:13, 416:23, 417:11, 417:20, 418:3, 418:5, 420:15, 420:22, 421:17, 421:24, 422:3, 422:25, 431:18, 431:21, 432:9, 432:12, 432:14, 432:18, 434:4, 434:13, 434:25, 435:6, 435:9, 435:15, 435:19, 435:21, 435:24, 436:3, 436:8, 436:9, 436:11, 436:15, 436:18, 436:21, 436:25, 437:3, 437:13, 437:16, 437:18, 437:21, 438:14, 438:17, 438:21, 440:16, 440:17, 442:6, 442:8, 450:7, 450:9, 450:12, 451:1, 451:7, 469:6, 478:16, 478:19, 478:24, 479:3, 479:11, 479:17, 482:3, 482:7,
---	--	--	--	--

482:20, 483:20, 483:23, 483:25, 484:5, 484:21, 485:6, 485:10, 485:16, 485:20, 486:16, 487:10, 487:13, 488:22, 489:1, 514:5, 514:10, 514:17, 514:24, 515:15, 515:19, 515:20, 516:4, 517:4, 517:9, 518:1, 518:10, 521:3 Commissioners [7] - 277:22, 295:20, 297:15, 310:13, 403:25, 507:19, 515:22 Commissioners' [1] - 262:13 commissions [3] - 357:11, 359:12 Commissions [1] - 443:15 commit [2] - 396:16, 406:11 commitment [14] - 395:6, 395:9, 395:14, 396:15, 397:7, 397:9, 404:16, 404:17, 405:18, 406:11, 406:13, 407:23, 408:1, 510:19 commitments [6] - 388:17, 389:2, 394:2, 394:8, 396:13, 400:13 committed [3] - 395:13, 395:16, 510:2 committee [1] - 349:1 committing [1] - 396:6 common [5] - 280:10, 350:3, 350:8, 350:12, 354:9 commonly [5] - 353:23, 355:3, 414:13, 456:1, 456:13 communicate [3] - 411:2, 411:4 communicated [1] - 478:9 communities [1] - 484:14 community [5] - 365:24, 366:1, 366:2, 373:9, 467:19 companies [1] -	408:13 company [12] - 301:3, 311:16, 321:19, 333:4, 375:7, 379:19, 385:4, 385:7, 385:10, 406:13, 469:19, 494:14 comparable [3] - 266:14, 318:21, 515:9 comparables [2] - 469:23, 477:18 compare [5] - 308:13, 309:5, 473:6, 474:20, 515:13 compared [3] - 455:24, 484:2, 496:23 comparing [1] - 308:16 comparison [5] - 291:3, 291:6, 336:12, 460:12, 504:16 compete [1] - 403:20 complaints [9] - 336:22, 367:23, 367:25, 499:4, 499:18, 500:25, 501:3, 513:7, 513:9 complete [4] - 326:3, 387:9, 456:8, 499:9 completed [26] - 311:20, 377:12, 382:3, 382:16, 382:18, 382:22, 383:7, 448:25, 455:13, 455:19, 455:20, 455:22, 457:17, 457:19, 463:15, 464:19, 466:5, 466:25, 490:23, 491:15, 491:20, 491:25, 500:18, 503:14 completely [3] - 271:23, 316:22, 397:4 completing [3] - 452:24, 472:10, 490:24 compliance [4] - 277:11, 281:10, 315:8, 448:13 comply [1] - 322:24 component [1] - 303:20 components [3] - 279:3, 304:10,	305:24 comprise [1] - 359:3 computers [1] - 315:24 concentrated [1] - 512:9 concept [2] - 346:16, 498:20 concern [9] - 305:12, 317:4, 317:14, 320:15, 329:21, 355:10, 357:14, 471:6, 498:19 concerned [5] - 281:10, 357:21, 374:10, 420:3, 439:25 concerning [3] - 385:5, 385:7, 385:10 concerns [5] - 322:24, 408:5, 418:22, 420:7, 470:18 concert [1] - 328:14 concerts [1] - 328:17 concluded [4] - 327:19, 336:15, 449:2, 500:13 concludes [1] - 378:12 conclusion [8] - 317:3, 416:11, 418:17, 421:20, 473:12, 479:12, 499:14, 499:16 conclusions [6] - 304:25, 316:20, 317:13, 472:9, 479:1, 500:14 condense [2] - 394:4, 394:7 Condition [4] - 295:17, 295:21, 496:4, 514:12 condition [22] - 296:1, 310:9, 310:12, 388:6, 388:13, 388:14, 389:4, 394:23, 395:2, 395:8, 395:11, 395:16, 396:8, 396:11, 404:8, 411:7, 426:22, 475:10, 475:11, 496:8, 511:3, 520:15 conditional [1] - 291:18 Conditional [4] - 257:9, 290:7, 292:1, 419:3 conditioner [3] -	306:21, 307:7, 307:17 conditioners [1] - 308:3 conditions [13] - 266:21, 275:23, 302:17, 312:7, 318:24, 388:8, 388:17, 400:11, 503:11, 504:7, 516:2, 519:15, 520:9 Conditions [3] - 258:20, 259:20, 261:16 conduct [7] - 296:6, 305:17, 385:4, 385:7, 385:10, 443:11, 443:12 conducted [4] - 314:4, 337:23, 376:19, 388:20 conducting [2] - 301:20, 361:12 confidence [4] - 400:16, 403:9, 404:19, 405:9 Confidential [2] - 257:11, 261:13 conflict [1] - 470:3 confused [1] - 460:4 confusion [1] - 262:14 congratulating [1] - 469:15 conjunction [1] - 269:11 Connecticut [1] - 350:24 connection [3] - 424:22, 439:15, 443:18 conservation [3] - 393:25, 394:1, 403:3 Conservation [1] - 376:25 conservative [13] - 264:6, 269:12, 269:24, 269:25, 270:3, 270:5, 286:20, 286:23, 318:12, 318:14, 318:23, 360:4, 504:6 consider [11] - 277:7, 359:3, 427:10, 435:2, 435:4, 435:12, 447:2, 471:3, 481:2, 498:23, 520:1 considerably [1] - 512:7 consideration [4] -	379:25, 472:2, 474:25, 496:25 considerations [1] - 281:16 considered [3] - 268:3, 491:14, 496:24 considering [1] - 356:25 consistency [1] - 488:16 consistent [1] - 486:11 constitutes [1] - 409:25 constitution [1] - 364:8 constructed [1] - 413:6 construction [3] - 303:4, 394:1, 456:8 consultant [5] - 291:20, 321:25, 333:24, 396:12, 405:20 consultants [3] - 494:14, 495:5, 495:7 Consultants [1] - 375:10 consulted [1] - 377:3 consulting [3] - 334:1, 375:24, 452:20 contacted [4] - 425:19, 457:5, 480:12, 493:7 contain [1] - 424:24 contained [1] - 410:1 contains [1] - 409:22 contemplating [1] - 431:12 content [2] - 424:19, 455:8 contents [1] - 427:11 context [3] - 362:22, 429:21, 435:16 contingent [1] - 394:16 continual [1] - 393:9 continually [4] - 402:20, 488:7, 488:13, 488:17 continue [2] - 345:13, 492:19 Continued [8] - 254:1, 255:1, 256:1, 257:1, 258:1, 259:1, 260:1, 261:1 continued [5] - 377:8, 419:17, 453:4, 457:1, 487:24
---	---	---	---	--

continues [2] - 335:6, 413:6 continuing [2] - 450:18, 452:24 contracted [1] - 351:6 contrary [2] - 410:25, 479:15 contributed [1] - 280:3 contributing [3] - 280:19, 298:19, 491:2 contribution [4] - 281:7, 298:4, 298:12, 298:14 contributions [2] - 280:15, 280:23 contributor [3] - 345:23, 372:25, 373:11 contributory [2] - 507:14 control [6] - 342:24, 350:1, 367:19, 367:20, 494:21, 500:7 controversy [1] - 317:19 conversation [2] - 426:14, 426:17 conversations [1] - 481:19 Cooperative [1] - 260:21 coordinate [2] - 408:19, 408:21 coordinated [1] - 408:12 coordinating [1] - 402:20 coordination [7] - 377:22, 389:20, 393:8, 393:9, 394:12, 402:21, 407:18 Coordination [1] - 257:4 copied [1] - 412:16 cops [1] - 297:8 copy [5] - 356:14, 423:12, 499:7, 519:18, 519:20 corner [1] - 264:17 correct [86] - 263:15, 263:16, 263:20, 263:21, 264:3, 264:4, 264:15, 269:9, 276:5, 276:6, 277:9, 277:12, 278:1, 280:7,	282:16, 284:16, 285:12, 287:17, 290:5, 299:15, 299:18, 299:19, 303:2, 303:9, 303:10, 303:15, 303:16, 303:18, 303:19, 304:8, 304:18, 306:8, 306:9, 307:14, 309:9, 309:11, 309:21, 309:22, 309:25, 310:1, 311:4, 314:1, 314:8, 318:16, 318:19, 319:18, 324:7, 326:14, 328:1, 341:5, 341:6, 343:2, 354:1, 356:1, 359:10, 361:8, 364:22, 372:3, 389:9, 398:17, 400:12, 409:9, 412:16, 413:10, 416:6, 441:8, 441:11, 441:12, 442:18, 442:19, 449:14, 454:23, 458:16, 465:2, 495:22, 500:11, 500:12, 501:19, 505:25, 508:21, 508:23, 510:7, 515:17, 516:18, 519:3, 522:12 Corrected [1] - 260:17 correcting [1] - 262:20 correction [1] - 454:3 corrections [7] - 302:6, 322:17, 334:13, 376:14, 454:1, 455:1, 495:14 correctly [4] - 338:12, 342:23, 421:5, 520:21 correlated [1] - 336:23 correlation [1] - 359:24 Correspondence [1] - 257:4 correspondence [1] - 393:9 corresponding [1] - 353:9 corridor [15] - 381:7, 392:5, 392:7, 392:9, 392:14, 392:15, 392:17, 392:20, 392:21, 393:15, 394:17, 398:7,	399:18, 405:1 couched [1] - 417:10 couches [1] - 416:21 counsel [13] - 347:1, 352:9, 410:16, 410:22, 412:12, 412:13, 412:18, 416:1, 417:4, 417:7, 417:16, 425:17, 446:23 counsel's [2] - 339:9, 443:4 count [6] - 284:12, 377:14, 382:4, 382:17, 423:10, 507:8 counterproposal [1] - 274:17 Counties [3] - 259:6, 262:5, 292:4 counties [8] - 333:13, 345:3, 345:4, 350:2, 350:23, 359:5, 377:6, 419:3 COUNTIES [1] - 251:6 countries [3] - 347:22, 348:7, 355:6 country [3] - 348:25, 349:1, 443:14 counts [1] - 289:1 COUNTY [1] - 522:3 county [16] - 290:25, 291:18, 291:22, 291:24, 292:2, 295:10, 335:5, 337:6, 341:14, 347:6, 357:10, 359:3, 359:12, 384:25, 490:2, 491:23 County [29] - 257:9, 260:22, 276:12, 276:16, 276:20, 276:24, 277:3, 277:7, 290:3, 290:7, 291:10, 291:18, 292:22, 350:9, 350:10, 365:5, 412:21, 455:13, 460:21, 460:24, 461:12, 463:7, 463:17, 464:11, 466:24, 478:7, 508:21, 519:6 couple [12] - 297:15, 317:8, 330:17, 362:5, 382:2, 393:24, 396:25, 406:19, 427:25, 490:14, 498:9	course [17] - 320:1, 327:13, 327:14, 335:6, 347:21, 357:9, 357:23, 369:7, 384:12, 386:2, 392:10, 396:17, 398:6, 401:4, 401:8, 401:15, 403:14 court [11] - 300:25, 321:16, 333:1, 338:25, 369:16, 375:4, 423:9, 423:22, 439:6, 452:7, 494:5 Court [1] - 429:24 courthouse [1] - 490:2 courts [1] - 348:3 cover [4] - 281:23, 281:25, 282:6, 504:3 covered [1] - 504:25 CR1-C10-P [2] - 265:12, 265:17 CR2-13 [1] - 384:12 CR2-58 [1] - 442:16 CR2-77 [1] - 274:5 CR2-ALT.3 [3] - 265:18, 265:19, 265:22 CR2-C98-NP [1] - 274:2 CR2-D221-NP [1] - 308:11 craft [1] - 496:14 crane [19] - 377:17, 382:14, 388:8, 390:17, 391:14, 391:16, 392:2, 392:4, 392:11, 392:15, 392:17, 394:6, 394:23, 395:23, 396:11, 401:3, 402:5, 420:6, 514:7 cranes [39] - 380:17, 388:15, 388:23, 390:11, 391:6, 391:12, 391:17, 391:18, 391:19, 391:25, 392:8, 393:5, 393:14, 393:21, 393:23, 394:9, 394:18, 395:2, 397:1, 398:21, 398:24, 399:15, 399:20, 400:8, 400:13, 401:17, 401:21, 402:12, 402:19,	402:23, 403:1, 404:20, 404:22, 405:2, 406:12, 406:24, 420:3, 420:4, 428:4 create [7] - 270:23, 271:10, 272:3, 306:19, 306:24, 327:23, 401:18 created [3] - 391:20, 402:7, 402:14 creates [1] - 310:19 creating [3] - 320:16, 419:16, 442:16 creation [1] - 402:4 credibility [1] - 478:13 credible [1] - 430:5 Creek [1] - 387:1 Cremer [1] - 251:13 CREMER [158] - 262:1, 263:1, 274:24, 277:15, 283:14, 292:7, 292:9, 293:1, 293:3, 293:6, 293:9, 294:11, 294:19, 297:13, 300:15, 300:19, 300:22, 302:20, 313:13, 313:17, 313:19, 315:1, 315:4, 316:6, 320:21, 320:25, 321:4, 321:8, 321:14, 323:20, 323:24, 325:19, 325:21, 325:24, 332:17, 332:20, 337:9, 340:12, 340:15, 355:17, 361:23, 367:11, 369:22, 371:20, 374:16, 374:19, 374:23, 374:25, 378:14, 378:17, 381:14, 381:17, 381:22, 381:24, 387:23, 387:25, 395:19, 396:20, 406:1, 406:3, 406:8, 406:14, 407:1, 407:3, 407:11, 409:1, 409:3, 409:7, 409:11, 409:14, 410:11, 413:25, 415:3, 415:15, 417:22, 418:1, 418:4, 420:9, 420:12, 420:23, 421:15, 421:21, 421:25, 422:2, 422:4, 422:12,
---	--	--	--	--

422:17, 423:1, 423:6, 423:10, 423:19, 428:23, 429:1, 429:22, 430:11, 430:19, 430:21, 431:11, 431:17, 431:20, 434:2, 438:23, 439:1, 439:4, 441:15, 441:18, 441:21, 441:25, 442:2, 442:4, 442:7, 442:9, 442:11, 442:21, 443:7, 443:22, 444:6, 445:13, 445:16, 445:20, 446:2, 446:5, 446:8, 450:3, 450:10, 450:17, 450:24, 451:8, 451:15, 451:18, 451:22, 451:25, 458:24, 459:2, 463:2, 468:9, 469:3, 489:2, 490:7, 490:11, 490:13, 493:10, 493:12, 493:15, 493:19, 493:22, 497:9, 497:12, 508:15, 511:21, 513:24, 518:17, 521:5, 521:11, 521:13, 521:15, 521:17, 521:22 crisp [1] - 268:22 criteria [3] - 305:12, 305:13, 437:7 critical [1] - 496:16 Crocker [1] - 487:19 Cross [37] - 253:4, 253:5, 253:5, 253:6, 253:10, 253:11, 253:11, 253:14, 253:15, 253:15, 253:16, 253:19, 253:19, 253:20, 254:4, 254:5, 254:5, 254:11, 254:12, 254:12, 254:15, 254:18, 254:19, 254:19, 254:20, 255:4, 255:5, 255:11, 255:12, 255:21, 255:22, 256:4, 256:5, 256:5, 256:14, 256:15, 256:15 CROSS [17] - 302:22, 313:21, 315:6,	324:1, 337:12, 355:19, 367:13, 369:23, 378:18, 388:3, 429:2, 430:23, 459:5, 463:5, 497:13, 508:16, 511:24 cross [24] - 264:21, 302:19, 304:14, 323:19, 326:4, 326:7, 326:10, 337:8, 413:18, 415:7, 417:19, 428:25, 429:19, 429:25, 430:6, 430:9, 441:17, 443:11, 443:12, 443:13, 458:23, 459:1, 497:8, 497:11 Cross-Examination [37] - 253:4, 253:5, 253:5, 253:6, 253:10, 253:11, 253:11, 253:14, 253:15, 253:15, 253:16, 253:19, 253:19, 253:20, 254:4, 254:5, 254:5, 254:11, 254:12, 254:12, 254:15, 254:18, 254:19, 254:19, 254:20, 255:4, 255:5, 255:11, 255:12, 255:21, 255:22, 256:4, 256:5, 256:5, 256:14, 256:15, 256:15 cross-examination [8] - 302:19, 323:19, 337:8, 415:7, 429:25, 430:6, 430:9, 497:11 CROSS- EXAMINATION [17] - 302:22, 313:21, 315:6, 324:1, 337:12, 355:19, 367:13, 369:23, 378:18, 388:3, 429:2, 430:23, 459:5, 463:5, 497:13, 508:16, 511:24 cross-sectional [3] - 326:4, 326:7, 326:10 crossing [1] - 444:3 crowned [1] - 322:25 CROWNED [1] - 251:4 Crowned [132] -	251:17, 257:3, 262:4, 262:7, 262:22, 275:13, 276:15, 277:11, 281:19, 283:25, 284:5, 285:7, 291:11, 291:19, 291:21, 291:22, 291:23, 291:24, 292:1, 292:3, 293:19, 296:22, 297:4, 297:6, 300:17, 300:23, 301:13, 302:16, 314:2, 314:12, 314:17, 314:21, 320:25, 321:24, 322:23, 323:15, 325:3, 332:17, 332:22, 333:10, 333:11, 333:12, 334:6, 334:21, 335:20, 336:1, 337:4, 356:21, 357:7, 357:15, 359:12, 359:20, 374:16, 375:1, 375:2, 375:12, 375:15, 376:19, 377:3, 377:8, 379:19, 383:17, 385:18, 386:18, 388:16, 389:3, 391:10, 391:13, 391:23, 393:7, 393:21, 393:22, 395:1, 395:5, 395:12, 395:14, 396:12, 396:14, 396:17, 397:23, 400:10, 402:20, 403:1, 403:10, 404:15, 405:12, 405:18, 405:19, 406:8, 406:11, 407:9, 408:17, 412:17, 413:5, 418:15, 420:12, 422:24, 425:12, 426:10, 428:24, 433:6, 438:6, 438:8, 440:7, 440:8, 441:16, 443:7, 444:8, 446:10, 447:1, 447:16, 456:17, 458:25, 483:20, 484:17, 490:9, 492:8, 492:9, 496:11, 497:10, 502:2, 510:2, 510:11, 517:7,	520:1, 520:2, 520:13, 521:9 CRR [1] - 251:24 crumby [1] - 353:10 crust [1] - 268:11 CRW [11] - 257:19, 257:20, 257:21, 259:6, 259:7, 259:8, 259:9, 259:22, 260:7, 260:8, 260:9 cue [1] - 335:12 cultural [10] - 375:15, 375:17, 375:19, 376:1, 376:21, 377:1, 377:19, 377:21, 377:23, 378:4 Cultural [2] - 257:11, 259:22 cumulative [3] - 280:2, 299:9, 520:16 CUP [1] - 333:16 curiosity [2] - 270:14, 470:25 curious [2] - 330:14, 383:2 current [10] - 277:4, 290:20, 310:2, 310:25, 386:17, 408:6, 408:22, 426:22, 510:22 Curriculum [2] - 257:23, 259:14 curtail [3] - 266:3, 274:9, 275:9 curtailed [2] - 264:25, 274:6 curtailing [1] - 265:25 curtailment [1] - 276:9 curve [2] - 509:19, 509:21 custom [1] - 512:17 cutting [1] - 266:25	349:7, 350:24, 354:16, 366:20, 370:3, 370:6, 370:12, 371:14, 371:15, 375:11, 377:5, 377:15, 380:15, 387:3, 387:5, 393:11, 394:13, 396:23, 397:14, 400:22, 419:16, 424:4, 428:10, 452:16, 453:10, 455:18, 456:16, 457:20, 458:4, 458:8, 459:9, 467:22, 468:23, 484:10, 485:22, 486:17, 487:11, 488:20, 492:9, 492:19, 501:13, 501:14, 515:21, 522:7, 522:13 DAKOTA [2] - 251:2, 522:1 Dakota's [1] - 402:24 damage [4] - 472:7, 473:11, 489:6, 489:7 dark [1] - 297:11 DARREN [1] - 256:13 Darren [4] - 261:12, 261:12, 394:24, 519:20 DARYL [1] - 253:9 Daryl [3] - 257:15, 257:15, 258:22 data [19] - 269:4, 306:22, 310:18, 312:18, 314:8, 470:20, 471:17, 472:17, 473:6, 473:8, 473:12, 474:13, 474:20, 474:21, 478:6, 486:7, 488:11, 488:16, 503:15 Data [2] - 449:25, 450:1 Database [1] - 387:4 database [2] - 387:4, 488:4 date [8] - 348:19, 364:5, 390:22, 426:20, 489:14, 491:16, 491:18, 491:21 Dated [1] - 522:13 dated [3] - 347:3, 348:14, 390:7 dates [1] - 383:1 Dates [1] - 257:4
---	---	---	---	---

David [7] - 261:14, 261:15, 452:6, 452:12, 493:21, 494:4, 494:10 DAVID [2] - 255:20, 256:3 days [7] - 368:2, 393:25, 427:25, 467:6, 470:21, 473:17, 473:22 dB [4] - 509:24, 510:16, 510:21, 516:23 dBA [34] - 266:13, 287:17, 287:18, 287:22, 287:23, 308:13, 309:7, 311:4, 312:2, 313:4, 419:6, 419:7, 444:15, 499:3, 499:18, 501:1, 501:18, 502:18, 503:7, 503:22, 509:13, 510:6, 510:12, 512:6, 513:7, 514:7, 517:11, 517:15, 519:12, 520:23, 521:1 de [3] - 251:14, 328:4, 435:3 DE-4 [1] - 474:7 dead [1] - 290:23 deal [7] - 267:8, 299:18, 342:24, 357:3, 478:13, 487:2, 505:16 dealing [7] - 274:12, 274:16, 282:22, 350:2, 459:19, 476:25, 505:19 debate [3] - 329:15, 517:10, 518:2 December [1] - 393:13 decibel [3] - 287:20, 308:11, 309:17 decibels [22] - 267:4, 287:25, 288:1, 290:22, 298:11, 298:13, 298:18, 308:20, 308:23, 318:10, 319:3, 319:4, 327:20, 335:1, 335:3, 351:16, 368:24, 369:8, 369:17 decide [1] - 419:9 decided [2] - 360:20, 476:13 deciding [1] - 486:14	decipher [1] - 280:18 decision [8] - 269:5, 275:20, 290:11, 445:12, 447:7, 480:19, 488:23, 501:17 decision-making [1] - 480:19 decisions [2] - 281:11, 281:13 declared [2] - 509:8, 519:1 Decommissioning [1] - 257:11 decrease [2] - 272:4, 272:7 deed [1] - 465:7 deeds [1] - 490:1 Deeds [1] - 465:8 default [2] - 339:19, 353:13 defeat [2] - 353:9, 353:12 defer [1] - 306:2 deferral [1] - 259:4 define [2] - 324:10, 489:19 defined [1] - 303:23 definite [1] - 513:14 definitely [6] - 285:20, 289:14, 295:12, 297:5, 299:8, 500:23 definition [3] - 279:9, 303:21, 480:15 definitive [1] - 405:2 defused [1] - 271:8 degree [9] - 322:5, 322:6, 322:8, 331:4, 356:5, 356:7, 356:9, 356:10, 452:24 delete [1] - 502:12 deletions [3] - 454:1, 455:1, 495:14 demand [3] - 477:12, 483:8, 504:20 demonstrate [1] - 440:15 dense [2] - 497:25, 502:20 density [2] - 498:10, 507:6 Department [2] - 519:2, 519:5 department [1] - 519:7 dependent [1] - 394:16 depict [2] - 296:15, 296:18 depicting [1] - 259:3 deprivation [6] -	267:15, 267:20, 317:25, 324:13, 324:16, 327:1 depth [1] - 504:3 derived [2] - 283:4, 283:7 describe [8] - 270:6, 283:5, 385:21, 393:22, 394:2, 394:7, 452:21, 453:7 described [6] - 341:24, 387:18, 393:5, 401:24, 420:19, 505:3 describing [4] - 303:8, 355:11, 363:1, 363:7 design [10] - 272:13, 281:21, 287:11, 309:20, 362:16, 500:15, 502:2, 509:13, 510:13, 513:17 designated [1] - 496:22 designation [5] - 453:2, 453:3, 453:6 designed [7] - 368:21, 376:22, 380:11, 380:15, 498:6, 498:24, 501:1 desirable [2] - 500:23, 513:6 desktop [5] - 376:19, 377:12, 380:4, 380:5, 388:19 destroyed [1] - 402:15 detail [3] - 487:14, 487:15, 487:16 detailed [6] - 281:17, 346:22, 377:11, 380:21, 487:23, 489:11 details [2] - 387:16, 455:19 detect [1] - 512:18 detected [2] - 388:24, 405:2 detections [2] - 394:10, 405:5 determination [2] - 339:25, 462:18 determine [15] - 279:24, 293:17, 304:4, 304:12, 304:13, 305:20, 309:24, 323:12, 355:8, 376:20, 457:3, 461:10, 461:20, 462:4, 463:17	determined [6] - 310:2, 340:9, 353:14, 390:15, 461:17, 462:4 DEUEL [1] - 251:6 Deuel [11] - 259:6, 259:7, 260:3, 262:5, 262:23, 262:24, 286:8, 286:12, 350:9, 412:21, 492:10 develop [4] - 320:19, 329:23, 388:22, 472:15 developed [2] - 353:5, 399:5 developing [3] - 328:22, 398:14, 472:9 development [2] - 375:25, 509:23 developments [2] - 301:21, 466:10 deviate [1] - 514:12 device [1] - 308:1 devices [1] - 306:19 devised [2] - 497:22, 498:24 DH-1 [1] - 257:15 DH-2 [1] - 257:16 DH-S-1 [1] - 258:23 DH-S-2 [1] - 259:3 DH-S-3 [1] - 259:4 diagnose [1] - 361:16 diagnosis [1] - 323:5 diesels [1] - 513:5 differ [1] - 269:17 difference [23] - 271:5, 287:21, 289:4, 299:14, 307:23, 308:14, 309:5, 309:8, 342:6, 384:16, 384:24, 395:15, 416:24, 436:22, 456:25, 457:8, 473:9, 514:18, 517:11, 518:3, 518:7, 518:9 different [25] - 288:17, 303:3, 309:2, 316:24, 317:12, 341:23, 380:10, 382:2, 382:12, 392:23, 393:1, 393:24, 398:9, 404:22, 408:14, 421:20, 435:16, 440:11, 458:17, 458:19, 471:9, 472:7, 478:3, 499:6,	503:16 differential [1] - 276:4 differentiate [2] - 461:7, 486:3 differently [1] - 498:6 differs [1] - 353:22 difficult [13] - 315:12, 315:17, 315:23, 457:25, 466:3, 466:16, 466:20, 485:13, 486:15, 512:12, 512:21, 515:4, 515:15 difficulty [1] - 515:12 dig [2] - 370:1, 462:3 dimension [1] - 338:20 dimensions [2] - 338:2, 339:24 dinner [1] - 342:4 dip [1] - 506:11 direct [16] - 262:7, 289:11, 355:4, 375:1, 378:13, 406:25, 422:8, 429:25, 430:4, 430:12, 443:12, 452:2, 455:9, 458:23, 495:4, 505:23 Direct [38] - 253:4, 253:10, 253:14, 253:18, 254:4, 254:6, 254:11, 254:15, 254:18, 255:4, 255:11, 255:14, 255:17, 255:21, 256:4, 256:8, 256:11, 256:14, 257:12, 257:12, 257:13, 257:14, 257:15, 257:16, 266:11, 302:1, 336:5, 376:6, 383:5, 394:24, 424:25, 465:9, 465:18, 495:13, 496:16, 497:19, 509:22, 511:13 DIRECT [10] - 262:15, 301:1, 321:17, 333:2, 375:5, 423:23, 439:7, 446:11, 452:8, 494:6 directed [3] - 415:18, 438:11, 452:25 directing [1] - 427:1 direction [3] - 280:12, 448:19, 478:3 directions [2] -
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403:1, 428:11, 428:12, 429:14, 440:25, 467:20 East [3] - 252:3, 398:14, 452:13 easy [6] - 290:12, 431:22, 478:25, 498:11, 498:17, 519:19 economic [2] - 323:10, 373:8 ecosystems [1] - 401:8 edge [5] - 284:20, 366:9, 383:23, 510:3, 510:5 edition [1] - 323:7 educating [1] - 404:21 education [5] - 301:18, 322:3, 333:18, 375:21, 453:4 educational [1] - 452:22 EDWARDS [33] - 294:21, 294:23, 295:13, 297:12, 315:7, 316:4, 325:23, 369:24, 371:19, 414:4, 416:5, 416:18, 417:6, 417:17, 423:15, 430:24, 431:9, 452:6, 452:9, 458:22, 489:3, 489:5, 490:6, 493:14, 493:20, 493:25, 494:4, 494:7, 497:6, 518:19, 518:21, 520:19, 520:25 Edwards [12] - 251:23, 253:16, 254:5, 254:9, 254:12, 254:20, 255:12, 255:21, 255:23, 256:4, 256:6, 414:4 effect [39] - 271:10, 272:11, 276:24, 278:8, 285:22, 317:24, 318:16, 323:4, 324:6, 324:12, 324:14, 338:11, 342:10, 344:3, 344:13, 344:16, 361:4, 362:16, 362:21, 363:12, 368:16, 388:21, 434:24, 444:18, 456:3,	467:15, 471:11, 471:18, 473:19, 483:6, 484:7, 484:13, 485:23, 505:6, 505:9, 505:13, 505:15, 510:24, 517:19 Effect [1] - 257:10 effective [2] - 489:14, 491:21 Effects [5] - 258:4, 258:6, 258:15, 258:16, 259:15 effects [39] - 299:9, 306:1, 324:9, 324:17, 330:4, 330:23, 330:25, 336:6, 336:11, 356:17, 356:18, 360:25, 363:10, 363:22, 363:24, 364:1, 365:19, 370:7, 374:7, 374:10, 384:23, 385:8, 412:23, 413:7, 434:16, 434:22, 435:1, 439:24, 440:1, 444:10, 447:6, 447:18, 448:9, 448:16, 470:8, 472:18, 506:1, 516:21, 517:18 effort [3] - 355:7, 496:17, 502:9 EHLEBRACHT [1] - 255:10 Ehlebracht [9] - 260:16, 412:14, 412:19, 413:2, 413:14, 416:25, 417:12, 423:21, 424:2 eight [5] - 347:8, 353:19, 354:3, 354:25, 508:9 eight-page [1] - 347:8 either [12] - 277:10, 299:7, 307:3, 307:8, 351:20, 359:25, 366:10, 383:24, 444:17, 447:25, 496:13, 501:22 EL18-026 [1] - 501:11 EL19-027 [2] - 251:4, 262:3 elaborate [1] - 262:20 elderly [1] - 435:22 electrical [1] - 434:21 electromagnetic [1] -	434:20 elementary [1] - 297:9 elevated [1] - 461:22 elevator [1] - 419:15 elevators [1] - 419:18 Elicit [2] - 258:19, 259:19 emission [4] - 309:24, 349:16, 362:13, 506:20 emissions [3] - 282:22, 282:23, 349:15 Emissions [1] - 258:22 emitted [1] - 364:24 emitter [1] - 306:13 emitting [2] - 279:12, 505:16 empathy [1] - 433:24 emphasis [1] - 376:4 empirically [3] - 269:10, 283:4, 283:7 employed [6] - 277:23, 301:6, 424:5, 424:6, 494:12 employer [1] - 447:2 employment [1] - 484:11 enclosed [1] - 338:14 encompass [1] - 284:17 end [11] - 266:16, 276:7, 353:18, 416:9, 416:10, 418:10, 431:16, 437:6, 469:15, 499:11, 518:9 Endangered [1] - 390:14 endangered [1] - 403:6 ends [1] - 349:20 ENERGY [1] - 251:5 Energy [3] - 303:12, 376:24, 380:12 energy [11] - 262:4, 301:22, 323:9, 366:3, 373:18, 373:21, 375:25, 403:21, 453:12, 472:8, 488:12 enforce [1] - 419:1 enforced [1] - 296:1 engaged [1] - 333:12 engineer [5] - 269:16, 269:17, 367:20, 367:22, 494:19 engineering [2] - 267:19, 322:5	engineers [1] - 367:19 engines [1] - 513:4 English [6] - 345:16, 349:12, 349:14, 352:2, 352:18, 352:21 enhanced [2] - 509:19, 509:21 enjoin [1] - 419:17 enjoy [3] - 412:2, 515:22, 515:23 enjoyment [1] - 470:12 ensure [2] - 369:6, 369:9 ensuring [2] - 355:13, 378:9 enter [3] - 275:25, 338:19, 358:9 entered [1] - 275:24 entering [1] - 358:18 enters [2] - 269:3, 339:21 entire [4] - 273:25, 382:5, 400:1, 405:9 entirely [2] - 342:14, 423:10 entitled [7] - 252:2, 336:10, 411:6, 412:8, 443:20, 444:3, 522:10 entrance [1] - 338:22 entry [1] - 349:14 environment [7] - 306:6, 306:22, 308:1, 310:19, 343:1, 358:9, 358:19 Environmental [1] - 375:9 environmental [21] - 301:25, 322:7, 322:11, 333:7, 333:8, 333:22, 333:24, 356:4, 356:5, 356:6, 356:10, 357:1, 357:23, 359:8, 370:25, 375:14, 375:17, 375:23, 376:1, 385:2 environmental- science [1] - 356:4 environments [4] - 306:23, 312:24, 328:21, 356:11 envision [1] - 338:24 EPCO [3] - 510:19, 510:24, 511:6 epidemiological [2] - 317:12, 361:11	Epilepsy [2] - 258:17, 1 4 258:18 epileptic [1] - 329:23 Epsilon [3] - 301:6, 301:11, 301:23 equal [4] - 288:1, 298:20, 391:20, 402:7 equals [1] - 288:2 equations [1] - 283:5 equipment [3] - 315:15, 315:20, 315:22 equity [1] - 476:18 equivalent [2] - 349:6, 349:9 erecting [1] - 347:22 error [1] - 283:9 escapes [1] - 420:1 esoteric [1] - 504:16 especially [1] - 407:23 essentially [18] - 276:3, 298:4, 331:5, 338:23, 339:16, 339:18, 339:23, 340:5, 341:25, 350:21, 382:6, 443:16, 497:2, 507:17, 510:20, 514:22, 517:22, 520:2 establish [4] - 304:19, 310:16, 310:20, 488:17 established [3] - 462:5, 485:18, 489:13 establishing [1] - 488:7 estate [6] - 452:20, 453:1, 453:5, 453:10, 463:9, 480:5 Estate [2] - 480:9, 480:12 estimate [9] - 280:8, 310:25, 438:1, 460:15, 460:17, 461:8, 461:13, 461:18, 465:23 estimation [2] - 350:15, 351:3 et [2] - 352:3, 393:4 Europe [3] - 336:16, 371:2, 373:2 European [5] - 317:8, 336:12, 336:18, 336:19, 347:21 evaluate [1] - 305:12 evaluation [2] - 305:17, 310:5
--	--	--	--	---

evening ^[1] - 344:9 evenly ^[1] - 312:19 events ^[1] - 382:10 eventually ^[2] - 490:25, 509:7 evergreens ^[1] - 429:11 everywhere ^[3] - 264:7, 282:12, 395:24 Evidence ^[3] - 258:21, 409:24, 410:7 evidence ^[10] - 280:25, 329:2, 334:19, 381:16, 414:10, 419:23, 462:1, 464:15, 470:6, 486:11 Evjen's ^[1] - 294:3 evolves ^[1] - 514:20 exact ^[9] - 283:5, 348:8, 360:12, 399:23, 467:21, 467:24, 491:16, 499:2, 520:9 exactly ^[14] - 264:2, 269:21, 283:10, 286:13, 290:10, 290:16, 317:2, 347:2, 381:6, 398:18, 421:18, 500:4, 504:23 Examination ^[68] - 253:4, 253:4, 253:5, 253:5, 253:6, 253:7, 253:7, 253:8, 253:10, 253:10, 253:11, 253:11, 253:14, 253:14, 253:15, 253:15, 253:16, 253:18, 253:19, 253:19, 253:20, 253:21, 254:4, 254:4, 254:5, 254:5, 254:6, 254:7, 254:7, 254:8, 254:8, 254:9, 254:11, 254:11, 254:12, 254:12, 254:15, 254:15, 254:18, 254:18, 254:19, 254:19, 254:20, 255:4, 255:4, 255:5, 255:11, 255:11, 255:12, 255:14, 255:17, 255:21, 255:21, 255:22, 255:23, 255:23, 256:4, 256:4, 256:5, 256:5, 256:6, 256:8,	256:11, 256:12, 256:14, 256:14, 256:15, 256:15 examination ^[11] - 302:19, 323:19, 337:8, 378:13, 415:7, 429:25, 430:4, 430:6, 430:9, 443:2, 497:11 EXAMINATION ^[35] - 262:15, 275:4, 277:19, 283:18, 292:11, 294:22, 301:1, 302:22, 313:21, 315:6, 321:17, 324:1, 333:2, 337:12, 355:19, 367:13, 369:23, 375:5, 378:18, 388:3, 423:23, 429:2, 430:23, 439:7, 446:11, 452:8, 459:5, 463:5, 489:4, 490:15, 494:6, 497:13, 508:16, 511:24, 518:20 examines ^[2] - 295:25, 390:5 example ^[20] - 307:17, 312:5, 331:9, 341:14, 343:16, 348:9, 349:8, 350:24, 351:13, 351:16, 360:25, 361:15, 364:25, 368:7, 407:9, 419:5, 444:13, 448:10, 501:1, 503:7 exceed ^[1] - 447:21 exceedance ^[3] - 274:1, 274:2, 274:19 exceeded ^[8] - 305:13, 352:3, 352:23, 444:18, 447:8, 447:9, 447:18, 448:17 exceeding ^[1] - 448:9 excellent ^[1] - 408:25 except ^[3] - 400:1, 414:12, 415:8 exceptions ^[1] - 415:21 excess ^[1] - 444:11 exclude ^[1] - 418:7 exclusive ^[2] - 309:24, 310:3 exclusively ^[1] - 494:19 excuse ^[8] - 280:5,	338:17, 429:18, 444:24, 456:24, 461:24, 463:14 excused ^[14] - 300:21, 321:7, 332:24, 374:21, 406:4, 406:6, 409:3, 409:6, 439:3, 442:23, 451:16, 451:17, 493:18, 521:20 execute ^[1] - 448:19 executive ^[1] - 290:13 exercise ^[1] - 415:19 exhibit ^[12] - 295:3, 340:21, 345:12, 349:11, 362:25, 390:19, 411:1, 412:19, 424:15, 424:19, 425:10, 514:11 Exhibit ^[80] - 257:13, 257:14, 257:15, 257:16, 257:16, 257:17, 257:17, 257:18, 257:23, 258:3, 258:4, 258:5, 258:7, 258:8, 258:10, 258:12, 258:13, 258:14, 258:16, 258:17, 258:18, 258:19, 258:20, 258:21, 258:23, 259:3, 259:4, 259:6, 259:7, 259:8, 259:9, 259:13, 259:14, 259:14, 259:15, 259:15, 259:17, 259:18, 259:19, 259:21, 259:23, 260:3, 260:4, 260:4, 260:5, 260:7, 260:8, 260:9, 294:25, 296:9, 302:24, 303:6, 306:5, 316:18, 322:14, 326:10, 334:9, 334:11, 340:19, 345:14, 346:14, 362:25, 363:20, 370:25, 385:14, 389:8, 389:13, 424:20, 424:24, 425:8, 425:23, 427:11, 439:17, 440:1, 453:20, 454:16, 495:9, 496:1, 499:15, 519:17 EXHIBITS ^[8] - 257:2,	258:2, 259:2, 260:2, 260:15, 260:20, 261:2, 261:11 Exhibits ^[5] - 261:12, 261:12, 261:13, 261:14, 261:14 exhibits ^[17] - 302:1, 302:7, 305:2, 322:13, 322:14, 322:18, 334:9, 334:14, 376:6, 376:9, 413:19, 422:9, 422:16, 454:9, 456:12, 460:19, 466:24 exist ^[6] - 279:7, 306:16, 400:20, 403:17, 419:2, 419:18 existing ^[4] - 456:4, 460:25, 461:16, 461:21 expand ^[1] - 498:9 expands ^[2] - 405:1, 517:3 expansion ^[2] - 394:17, 507:18 expect ^[4] - 387:13, 392:21, 447:25, 503:6 expected ^[3] - 320:18, 357:20, 447:21 expecting ^[1] - 441:2 experience ^[32] - 267:7, 269:3, 269:6, 269:15, 274:3, 285:25, 288:8, 301:19, 301:20, 307:2, 314:16, 322:4, 333:19, 334:2, 337:1, 343:7, 343:10, 361:10, 368:12, 368:13, 370:4, 370:5, 370:9, 370:20, 375:22, 375:23, 453:8, 472:13, 476:5, 500:18, 500:24, 517:25 experienced ^[5] - 307:22, 307:24, 343:14, 343:25, 363:23 experiences ^[1] - 268:10 experiencing ^[1] - 361:20 expert ^[8] - 340:8, 398:23, 405:22, 409:25, 459:10,	479:5, 512:16 expertise ^[2] - 356:25, 515:16 experts ^[6] - 332:11, 393:5, 400:10, 402:22, 502:3, 503:8 expired ^[7] - 463:19, 464:1, 464:12, 464:14, 464:21, 465:10, 465:14 explain ^[6] - 265:24, 315:14, 434:14, 463:16, 475:17, 497:23 explained ^[7] - 302:14, 470:2, 470:5, 470:6, 470:10, 470:15, 470:22 explaining ^[1] - 263:6 explanation ^[5] - 366:15, 380:25, 399:8, 410:19, 464:20 Explanation ^[1] - 259:4 exponentially ^[2] - 287:24, 501:6 Exposure ^[2] - 258:3, 259:14 exposure ^[3] - 272:5, 331:5, 356:19 express ^[1] - 411:6 expressed ^[4] - 307:10, 406:17, 448:22, 498:19 expression ^[2] - 406:17, 516:8 extend ^[4] - 303:24, 305:6, 398:16, 403:19 extended ^[1] - 397:21 extends ^[1] - 413:9 extent ^[10] - 341:10, 378:6, 387:16, 410:15, 411:22, 414:18, 414:24, 415:9, 424:19, 446:19 exterior ^[5] - 279:3, 335:2, 335:14, 343:6, 351:17 externalities ^[1] - 491:7 extreme ^[1] - 401:5 extremely ^[4] - 363:16, 512:12, 512:21, 513:9 eye ^[1] - 289:12 eyes ^[1] - 263:3
--	--	---	---	---

F				
face [1] - 271:18	452:13, 471:23, 483:5, 483:6, 483:7, 484:14	411:3, 459:20, 461:16, 492:6, 492:7, 500:11	320:13, 320:20, 330:17, 331:1, 331:10, 331:20, 332:1, 332:16, 336:8, 340:13, 371:23, 395:22, 396:19, 397:2, 404:12, 421:24, 431:21, 432:9, 432:12, 432:14, 432:18, 436:8, 437:18, 437:21, 438:14, 438:17, 438:21, 440:17, 442:8, 450:9, 450:12, 469:6, 482:7, 482:20, 483:20, 483:23, 483:25, 484:5, 484:21, 485:6, 485:10, 485:16, 485:20, 486:16, 487:10, 487:13, 488:22, 489:1, 515:20, 516:4, 517:4, 517:9, 518:1, 518:10, 521:3	final [5] - 300:17, 421:12, 447:6, 493:13, 501:17
facilities [3] - 336:14, 357:3, 403:20	familiar [22] - 315:8, 318:2, 326:5, 326:17, 328:19, 329:3, 337:21, 337:22, 345:20, 346:7, 346:19, 360:9, 365:4, 365:7, 365:12, 399:11, 425:12, 463:22, 504:2, 508:7, 508:20, 509:21	Farms [1] - 259:17	330:17, 331:1, 331:10, 331:20, 332:1, 332:16, 336:8, 340:13, 371:23, 395:22, 396:19, 397:2, 404:12, 421:24, 431:21, 432:9, 432:12, 432:14, 432:18, 436:8, 437:18, 437:21, 438:14, 438:17, 438:21, 440:17, 442:8, 450:9, 450:12, 469:6, 482:7, 482:20, 483:20, 483:23, 483:25, 484:5, 484:21, 485:6, 485:10, 485:16, 485:20, 486:16, 487:10, 487:13, 488:22, 489:1, 515:20, 516:4, 517:4, 517:9, 518:1, 518:10, 521:3	finally [1] - 353:16
FACILITY [1] - 251:5	family [2] - 475:5, 494:14	fast [1] - 414:16	371:23, 395:22, 396:19, 397:2, 404:12, 421:24, 431:21, 432:9, 432:12, 432:14, 432:18, 436:8, 437:18, 437:21, 438:14, 438:17, 438:21, 440:17, 442:8, 450:9, 450:12, 469:6, 482:7, 482:20, 483:20, 483:23, 483:25, 484:5, 484:21, 485:6, 485:10, 485:16, 485:20, 486:16, 487:10, 487:13, 488:22, 489:1, 515:20, 516:4, 517:4, 517:9, 518:1, 518:10, 521:3	financing [2] - 485:18, 491:20
facility [1] - 262:5	family-run [1] - 494:14	favorite [1] - 477:5	450:12, 469:6, 482:7, 482:20, 483:20, 483:23, 483:25, 484:5, 484:21, 485:6, 485:10, 485:16, 485:20, 486:16, 487:10, 487:13, 488:22, 489:1, 515:20, 516:4, 517:4, 517:9, 518:1, 518:10, 521:3	findings [3] - 314:9, 320:17, 320:19
facing [2] - 429:15, 440:25	fan [1] - 469:11	feasible [10] - 287:7, 287:9, 385:20, 385:22, 385:23, 386:2, 386:4, 386:8, 386:11, 386:13	450:12, 469:6, 482:7, 482:20, 483:20, 483:23, 483:25, 484:5, 484:21, 485:6, 485:10, 485:16, 485:20, 486:16, 487:10, 487:13, 488:22, 489:1, 515:20, 516:4, 517:4, 517:9, 518:1, 518:10, 521:3	fine [3] - 419:23, 434:9, 476:23
fact [26] - 262:23, 291:11, 316:22, 323:8, 336:1, 346:20, 351:5, 361:9, 367:25, 371:8, 403:16, 410:1, 410:13, 420:2, 469:22, 471:10, 480:14, 480:17, 480:18, 480:23, 481:2, 481:6, 481:22, 486:23, 499:23, 515:16	fancy [1] - 327:16	feather [1] - 509:19	450:12, 469:6, 482:7, 482:20, 483:20, 483:23, 483:25, 484:5, 484:21, 485:6, 485:10, 485:16, 485:20, 486:16, 487:10, 487:13, 488:22, 489:1, 515:20, 516:4, 517:4, 517:9, 518:1, 518:10, 521:3	finger [1] - 285:4
factor [25] - 269:2, 269:7, 281:24, 282:10, 283:8, 283:9, 287:3, 287:5, 288:17, 295:19, 295:22, 296:3, 296:4, 300:10, 318:10, 319:2, 347:5, 486:5, 504:1, 504:4, 507:2, 510:17, 510:23, 516:16	far [27] - 271:7, 272:1, 286:12, 287:8, 293:7, 293:18, 299:4, 304:9, 304:12, 305:5, 305:7, 348:15, 349:3, 372:10, 384:19, 397:12, 401:12, 403:5, 404:7, 431:15, 435:17, 460:12, 467:25, 484:19, 505:7, 510:14	February [5] - 251:8, 252:4, 390:23, 522:11, 522:14	450:12, 469:6, 482:7, 482:20, 483:20, 483:23, 483:25, 484:5, 484:21, 485:6, 485:10, 485:16, 485:20, 486:16, 487:10, 487:13, 488:22, 489:1, 515:20, 516:4, 517:4, 517:9, 518:1, 518:10, 521:3	finish [1] - 445:17
factored [1] - 280:5	Farm [7] - 260:16, 260:22, 365:4, 365:5, 508:20, 509:7, 518:23	fell [2] - 295:10, 486:11	450:12, 469:6, 482:7, 482:20, 483:20, 483:23, 483:25, 484:5, 484:21, 485:6, 485:10, 485:16, 485:20, 486:16, 487:10, 487:13, 488:22, 489:1, 515:20, 516:4, 517:4, 517:9, 518:1, 518:10, 521:3	finished [1] - 513:19
factors [5] - 283:7, 372:8, 489:25, 491:2, 517:12	farm [33] - 272:13, 279:10, 279:11, 287:6, 287:9, 306:11, 306:12, 307:19, 307:20, 310:4, 323:15, 342:16, 371:7, 413:5, 413:6, 419:2, 419:22, 425:19, 426:11, 426:19, 434:22, 460:10, 461:21, 498:24, 499:19, 500:25, 501:18, 502:2, 503:6, 505:4, 506:20, 506:25, 507:10	fellowship [1] - 322:11	450:12, 469:6, 482:7, 482:20, 483:20, 483:23, 483:25, 484:5, 484:21, 485:6, 485:10, 485:16, 485:20, 486:16, 487:10, 487:13, 488:22, 489:1, 515:20, 516:4, 517:4, 517:9, 518:1, 518:10, 521:3	fired [2] - 373:20, 373:24
facts [6] - 276:14, 381:15, 410:21, 427:6, 457:12, 480:7	farm's [1] - 501:20	felt [5] - 417:9, 476:1, 481:20, 481:22, 487:8	450:12, 469:6, 482:7, 482:20, 483:20, 483:23, 483:25, 484:5, 484:21, 485:6, 485:10, 485:16, 485:20, 486:16, 487:10, 487:13, 488:22, 489:1, 515:20, 516:4, 517:4, 517:9, 518:1, 518:10, 521:3	fireworks [1] - 436:12
fair [9] - 276:23, 277:6, 285:23, 340:10, 359:4, 414:17, 500:19, 511:5	farmer [2] - 358:15, 358:17	few [17] - 316:10, 321:10, 342:4, 388:2, 392:10, 400:16, 400:23, 403:7, 415:21, 453:16, 459:3, 459:7, 463:3, 497:15, 497:18, 516:21	450:12, 469:6, 482:7, 482:20, 483:20, 483:23, 483:25, 484:5, 484:21, 485:6, 485:10, 485:16, 485:20, 486:16, 487:10, 487:13, 488:22, 489:1, 515:20, 516:4, 517:4, 517:9, 518:1, 518:10, 521:3	firm [1] - 296:5
fairly [7] - 271:12, 312:19, 317:17, 360:4, 440:5, 446:3, 467:22	farmers [1] - 408:1	fewer [3] - 498:13, 512:5, 512:7	450:12, 469:6, 482:7, 482:20, 483:20, 483:23, 483:25, 484:5, 484:21, 485:6, 485:10, 485:16, 485:20, 486:16, 487:10, 487:13, 488:22, 489:1, 515:20, 516:4, 517:4, 517:9, 518:1, 518:10, 521:3	first [29] - 263:3, 275:6, 276:15, 295:24, 333:11, 352:2, 358:2, 362:5, 364:14, 364:23, 365:3, 365:22, 366:18, 371:9, 409:21, 415:6, 416:3, 416:9, 417:2, 456:10, 463:21, 482:15, 485:24, 486:4, 487:5, 487:18, 505:14, 505:15, 520:22
fall [5] - 284:23, 308:18, 383:8, 383:18, 481:13	farms [11] - 323:13, 336:16, 371:13, 407:18, 408:11, 411:3, 459:20, 461:16, 492:6, 492:7, 500:11	Fiberglass [4] - 357:25, 358:3, 358:5, 358:19	450:12, 469:6, 482:7, 482:20, 483:20, 483:23, 483:25, 484:5, 484:21, 485:6, 485:10, 485:16, 485:20, 486:16, 487:10, 487:13, 488:22, 489:1, 515:20, 516:4, 517:4, 517:9, 518:1, 518:10, 521:3	First [2] - 261:9, 412:2
fallen [2] - 288:9, 314:23		FIEN [76] - 251:12, 264:10, 264:12, 265:5, 265:8, 265:15, 265:24, 266:5, 272:25, 273:5, 273:9, 273:14, 273:17, 273:21, 274:8, 274:20, 275:17, 319:15, 319:19, 319:24, 320:9, 320:13, 320:20, 330:17, 331:1, 331:10, 331:20, 332:1, 332:16, 336:8, 340:13, 371:23, 395:22, 396:19, 397:2, 404:12, 421:24, 431:21, 432:9, 432:12, 432:14, 432:18, 436:8, 437:18, 437:21, 438:14, 438:17, 438:21, 440:17, 442:8, 450:9, 450:12, 469:6, 482:7, 482:20, 483:20, 483:23, 483:25, 484:5, 484:21, 485:6, 485:10, 485:16, 485:20, 486:16, 487:10, 487:13, 488:22, 489:1, 515:20, 516:4, 517:4, 517:9, 518:1, 518:10, 521:3	450:12, 469:6, 482:7, 482:20, 483:20, 483:23, 483:25, 484:5, 484:21, 485:6, 485:10, 485:16, 485:20, 486:16, 487:10, 487:13, 488:22, 489:1, 515:20, 516:4, 517:4, 517:9, 518:1, 518:10, 521:3	first-name [1] - 487:5
falling [1] - 279:3			450:12, 469:6, 482:7, 482:20, 483:20, 483:23, 483:25, 484:5, 484:21, 485:6, 485:10, 485:16, 485:20, 486:16, 487:10, 487:13, 488:22, 489:1, 515:20, 516:4, 517:4, 517:9, 518:1, 518:10, 521:3	Fish [20] - 376:24, 376:25, 377:4, 377:5, 378:1, 378:3, 380:7, 380:14, 380:15, 387:5, 389:22, 390:6, 390:10, 391:2, 391:5, 393:10, 393:11, 393:12, 394:13, 402:22
falls [2] - 272:10, 437:8			450:12, 469:6, 482:7, 482:20, 483:20, 483:23, 483:25, 484:5, 484:21, 485:6, 485:10, 485:16, 485:20, 486:16, 487:10, 487:13, 488:22, 489:1, 515:20, 516:4, 517:4, 517:9, 518:1, 518:10, 521:3	fit [1] - 471:19
Falls [7] - 419:14,			450:12, 469:6, 482:7, 482:20, 483:20, 483:23, 483:25, 484:5, 484:21, 485:6, 485:10, 485:16, 485:20, 486:16, 487:10, 487:13, 488:22, 489:1, 515:20, 516:4, 517:4, 517:9, 518:1, 518:10, 521:3	five [6] - 280:15, 284:2, 285:19, 286:13, 372:15, 409:11

273:25, 274:6, 274:18, 278:2, 278:7, 278:10, 278:18, 278:21, 278:22, 278:24, 278:25, 279:2, 279:7, 279:12, 279:15, 279:20, 279:23, 280:1, 280:11, 289:18, 289:20, 291:3, 299:15, 299:18, 299:21, 322:22, 323:15, 329:11, 329:15, 329:22, 330:1, 330:7, 334:25, 336:20, 337:3, 337:20, 337:22, 338:1, 338:10, 338:13, 339:2, 339:4, 339:13, 340:8, 340:9, 340:22, 341:5, 341:8, 341:10, 341:13, 341:16, 341:17, 341:20, 341:21, 341:25, 342:4, 342:10, 342:16, 342:20, 342:24, 343:7, 343:10, 343:15, 343:22, 344:3, 344:4, 344:13, 344:19, 344:21, 346:8, 346:16, 346:23, 347:5, 347:20, 348:1, 348:4, 348:12, 348:15, 350:6, 350:8, 350:11, 350:25, 351:19, 353:7, 354:4, 354:7, 354:11, 354:25, 355:9, 356:13, 358:24, 359:10, 359:13, 359:14, 359:18, 359:23, 360:7, 360:23, 361:1, 363:23, 365:1, 367:23, 368:1, 368:9, 368:13, 368:16, 370:16, 372:18, 428:5, 428:7, 429:16, 430:8, 434:19, 441:2, 444:14, 447:7, 448:10, 462:8, 462:19, 473:3, 473:19, 493:2,	501:23, 501:25 flicker's [1] - 330:11 flickered [1] - 363:7 flickering [4] - 271:10, 289:16, 342:15, 344:2 flies [1] - 399:22 flock [2] - 399:21, 399:22 flooding [3] - 401:6, 401:12, 402:15 Florida [1] - 399:12 flow [2] - 504:11, 504:17 flowchart [1] - 388:22 fluctuations [1] - 503:19 fluffy [1] - 268:15 fly [1] - 391:21 flying [1] - 382:9 focus [8] - 299:21, 300:4, 300:11, 305:12, 317:9, 318:3, 343:8, 424:19 focused [3] - 342:14, 356:6, 500:10 folks [3] - 476:6, 495:7, 501:4 follow [7] - 295:20, 319:13, 410:6, 414:8, 433:25, 443:2, 487:4 follow-up [2] - 295:20, 319:13 following [4] - 252:1, 377:13, 390:15, 443:4 footprint [3] - 456:16, 461:3, 498:7 FOR [1] - 251:5 forbid [1] - 445:20 foresee [1] - 492:13 forgive [2] - 418:5, 442:13 forgot [1] - 508:10 form [5] - 377:20, 443:3, 458:8, 489:6, 497:17 formal [1] - 311:20 formed [1] - 410:21 forms [1] - 410:2 formula [1] - 282:14 formulas [1] - 283:10 forth [11] - 302:17, 310:14, 327:17, 328:7, 400:11, 414:13, 419:16, 476:9, 480:10, 502:20, 512:25 forward [6] - 263:4,	394:8, 395:6, 482:11, 488:18, 492:16 Foss [1] - 252:3 fossil [1] - 513:1 foundation [3] - 292:23, 292:24, 294:9 four [11] - 280:15, 285:21, 286:2, 290:4, 291:1, 291:9, 291:15, 398:15, 400:25, 497:3 Fourth [4] - 313:8, 436:5, 436:6, 436:13 fourth [2] - 272:10, 436:6 fraction [1] - 342:7 frame [4] - 346:10, 348:20, 365:14, 423:12 frankly [3] - 331:19, 415:20, 434:6 free [1] - 385:19 frequencies [5] - 304:1, 304:14, 307:25, 308:7, 516:25 frequency [23] - 301:16, 303:22, 306:7, 306:13, 306:16, 306:20, 306:24, 306:25, 307:21, 308:2, 314:13, 317:3, 317:10, 317:13, 357:8, 357:14, 357:19, 364:25, 385:11, 505:10, 505:12, 506:10, 511:10 Frequency [6] - 257:18, 258:11, 258:12, 259:16, 259:18, 260:21 fresh [1] - 504:10 freshly [2] - 288:9, 314:22 friendly [3] - 429:19, 430:6, 430:8 front [24] - 271:17, 288:25, 295:1, 345:18, 346:12, 357:10, 357:12, 359:5, 359:20, 367:6, 369:15, 421:22, 424:15, 439:19, 453:20, 453:21, 454:17, 468:4, 487:18,	495:9, 506:2, 515:5, 517:3 frozen [2] - 504:18, 504:21 fudge [1] - 269:2 fuel [1] - 513:1 full [7] - 270:24, 271:2, 416:9, 416:14, 418:11, 491:10, 494:8 fully [1] - 419:25 functioning [1] - 419:15 funded [1] - 319:17 FURTHER [1] - 262:15 future [6] - 403:18, 418:25, 419:21, 456:20, 457:14, 458:10	468:5 generally [6] - 268:18, 281:25, 324:11, 387:19, 494:25, 519:25 generate [3] - 280:20, 280:21, 289:21 generating [2] - 289:23, 403:20 generator [1] - 325:14 Generator [1] - 258:23 generators [1] - 513:4 gentleman [3] - 474:9, 475:9, 490:12 gentleman's [1] - 466:2 George [1] - 494:11 German [26] - 345:15, 345:16, 346:16, 346:24, 347:15, 348:4, 348:21, 348:23, 349:12, 350:22, 351:3, 352:6, 352:9, 352:11, 352:13, 352:14, 353:22, 353:23, 354:8, 354:24, 355:5, 360:8, 360:16, 361:21, 363:4 Germans [2] - 341:16, 347:21 Germany [8] - 346:18, 347:21, 348:1, 348:5, 348:18, 364:1, 364:2, 364:8 given [8] - 269:14, 292:4, 311:5, 312:21, 335:24, 380:13, 443:10, 503:15 glad [3] - 275:17, 356:20, 473:20 global [1] - 411:3 goal [2] - 509:13, 510:13 Godfather's [1] - 425:20 goodness [1] - 400:4 Goodwin [6] - 420:5, 424:4, 424:8, 424:9, 424:11, 439:13 Google [2] - 464:6, 491:10 govern [1] - 345:4 government [2] - 432:24, 432:25 governmental [1] - 343:12 grabbing [1] - 281:25
G				
Game [5] - 377:5, 380:15, 387:5, 393:11, 394:13 game [2] - 379:16, 414:17 garage [1] - 475:5 GARRY [2] - 255:10, 424:2 Garry [8] - 260:16, 423:21, 424:2, 424:5, 424:13, 430:17, 430:20, 439:23 GARY [1] - 251:11 Gary [8] - 300:16, 457:20, 469:7, 475:13, 475:25, 478:8, 479:21, 484:19 gas [5] - 338:17, 373:20, 373:24, 513:5 gas-fired [2] - 373:20, 373:24 gather [3] - 277:25, 282:11, 498:7 gathered [2] - 340:9, 458:6 GE [4] - 259:11, 454:5, 455:4 gee [1] - 404:22 geese [1] - 381:8 general [10] - 310:18, 317:17, 332:7, 411:3, 452:15, 452:17, 498:14, 500:14, 503:9, 520:1 generalization [1] -				

grad ^[1] - 363:13 graduate ^[2] - 357:23, 363:5 graduated ^[2] - 301:23, 452:23 grain ^[2] - 419:15, 419:18 Grand ^[1] - 259:6 grandchild ^[1] - 436:2 grandchildren ^[2] - 435:25, 436:12 Grant ^[17] - 259:7, 260:4, 262:5, 276:12, 276:16, 276:19, 276:24, 277:3, 277:7, 290:3, 290:7, 290:25, 291:10, 291:18, 292:4, 292:22, 350:9 GRANT ^[1] - 251:5 grant ^[1] - 418:7 granted ^[2] - 422:15, 425:5 granular ^[2] - 504:18, 504:21 grass ^[3] - 268:6, 278:19, 518:12 grassland ^[1] - 380:8 grassland/wetland ^[2] - 378:2, 380:8 grasslands ^[1] - 378:1 grateful ^[1] - 313:23 gravel ^[2] - 344:10, 492:4 gray ^[1] - 519:21 great ^[8] - 263:2, 267:8, 289:7, 387:16, 404:19, 434:8, 440:17, 478:13 greater ^[8] - 304:20, 305:11, 305:16, 308:6, 327:23, 344:5, 383:25 Greber ^[13] - 260:18, 308:9, 308:10, 413:9, 413:13, 413:16, 413:20, 413:21, 413:23, 415:23, 416:8, 416:13, 418:9 green ^[1] - 379:3 greenhouse ^[11] - 264:5, 277:22, 278:12, 279:25, 286:19, 337:19, 337:23, 338:3, 338:17, 338:18 greenways ^[1] - 279:4 Greg ^[1] - 251:14	grew ^[1] - 471:23 ground ^[23] - 269:7, 281:25, 282:16, 282:25, 283:8, 287:2, 410:3, 504:3, 504:10, 505:5, 505:8, 505:12, 505:25, 506:1, 506:4, 506:6, 506:9, 516:16, 516:22, 517:5, 517:19, 518:11 grounds ^[3] - 409:18, 410:8, 418:21 groundwater ^[1] - 387:17 groundwork ^[1] - 469:25 group ^[3] - 301:8, 301:12, 334:3 grouse ^[1] - 377:17 GS ^[1] - 461:12 guarantee ^[4] - 369:11, 369:14, 406:21, 428:15 guaranteed ^[1] - 369:14 guess ^[18] - 264:16, 274:21, 291:5, 299:25, 318:14, 319:15, 324:14, 370:2, 404:11, 407:21, 417:17, 420:15, 422:14, 423:4, 423:6, 427:16, 450:13, 481:7 guidance ^[3] - 351:8, 351:11, 351:12 Guidance ^[1] - 377:1 guide ^[2] - 362:13, 399:6 guideline ^[1] - 507:15 Guidelines ^[3] - 258:11, 376:24, 380:12 guidelines ^[5] - 317:9, 376:23, 377:9, 380:13, 500:9 guy ^[1] - 475:4 guys ^[1] - 450:5	392:25, 401:2, 401:17, 401:19, 401:23, 401:24, 402:5, 402:12, 402:14, 402:15, 402:25 Habitat ^[1] - 257:6 HALEY ^[1] - 254:3 Haley ^[19] - 257:12, 259:5, 260:6, 262:9, 262:12, 266:9, 277:21, 300:19, 308:12, 308:19, 318:21, 319:8, 337:18, 337:25, 338:12, 340:3, 341:24, 363:7, 503:24 Haley's ^[4] - 310:22, 337:15, 340:5, 353:25 half ^[12] - 272:4, 285:5, 292:16, 293:13, 294:6, 332:5, 378:8, 379:25, 431:4, 431:6, 509:23, 510:21 half-mile ^[2] - 431:4, 431:6 hand ^[1] - 296:9 handed ^[1] - 425:13 handled ^[1] - 408:12 hands ^[1] - 281:19 handwriting ^[1] - 423:5 hang ^[1] - 431:23 HANSON ^[110] - 251:11, 266:9, 266:11, 266:24, 267:7, 267:10, 267:13, 267:18, 267:21, 268:1, 268:5, 268:20, 269:1, 269:9, 269:15, 269:23, 270:7, 270:11, 271:1, 271:11, 271:21, 272:4, 272:23, 316:10, 316:15, 316:17, 317:15, 317:23, 318:5, 318:8, 318:19, 319:1, 319:12, 325:25, 326:2, 326:9, 326:17, 326:25, 327:21, 328:1, 328:11, 328:24, 329:6, 371:24,	372:1, 372:5, 373:13, 374:13, 396:21, 396:23, 396:25, 397:3, 397:8, 397:13, 397:17, 397:21, 397:25, 398:3, 398:10, 398:20, 399:1, 399:10, 399:14, 399:20, 399:25, 400:4, 400:15, 401:1, 401:10, 401:14, 402:1, 403:8, 403:15, 404:10, 404:18, 405:21, 406:19, 406:22, 417:25, 421:2, 421:10, 421:14, 422:1, 423:11, 423:18, 431:12, 432:15, 432:20, 433:5, 433:7, 433:17, 433:20, 442:10, 442:13, 442:20, 444:24, 469:11, 469:14, 469:25, 471:16, 474:24, 475:20, 476:5, 476:21, 476:23, 477:17, 478:12, 514:1, 520:20, 521:2 Hanson ^[21] - 266:7, 281:22, 287:16, 310:24, 325:24, 326:1, 331:14, 371:25, 396:2, 396:20, 406:10, 417:24, 421:25, 431:11, 436:24, 437:25, 442:9, 469:8, 482:16, 513:25, 514:6 Hanson's ^[1] - 335:25 happy ^[6] - 273:16, 313:24, 362:8, 363:15, 405:19, 418:12 harbor ^[1] - 440:20 hard ^[2] - 427:21, 431:23 harder ^[2] - 461:8, 483:12 Hart ^[4] - 257:15, 257:15, 258:22, 274:5 HART ^[1] - 253:9 Harvard ^[1] - 322:12 Harvest ^[5] - 262:23,	262:24, 286:8, 286:12, 492:10 hasten ^[1] - 500:21 hazard ^[3] - 331:4, 509:8, 519:1 head ^[8] - 283:23, 284:1, 287:20, 293:4, 295:2, 346:3, 367:8, 451:8 headed ^[1] - 473:11 health ^[45] - 306:1, 322:2, 322:7, 322:24, 323:4, 323:16, 324:6, 324:8, 324:12, 324:14, 324:17, 329:13, 329:18, 329:20, 330:4, 330:10, 330:23, 330:25, 333:8, 333:15, 333:22, 333:24, 334:4, 335:4, 335:7, 337:5, 356:6, 356:11, 358:10, 358:19, 360:14, 360:17, 360:18, 360:25, 361:2, 361:3, 362:20, 365:19, 368:20, 369:3, 369:19, 374:6, 509:8, 519:1 Health ^[21] - 258:9, 258:10, 258:16, 259:15, 259:15, 322:12, 326:13, 326:23, 327:4, 327:8, 327:18, 328:9, 332:3, 342:19, 359:22, 361:13, 368:7, 369:1, 509:9, 519:2, 519:5 Health-Based ^[1] - 258:10 health-related ^[1] - 322:2 hear ^[21] - 268:12, 307:16, 307:17, 311:1, 328:12, 329:1, 357:2, 357:4, 373:13, 403:8, 418:24, 426:7, 436:16, 467:12, 473:2, 473:13, 474:11, 487:16, 505:11, 520:21 heard ^[16] - 262:23, 263:7, 264:12, 267:24, 332:10,
--	--	--	---	---

383:12, 407:16, 418:18, 419:6, 478:19, 482:21, 485:1, 509:16, 509:25, 517:13, 520:24 Hearing [1] - 257:22 hearing [16] - 262:2, 290:19, 299:5, 326:21, 333:17, 374:25, 407:13, 409:14, 423:12, 437:23, 437:24, 443:21, 456:13, 460:7, 495:2, 521:24 hearings [5] - 270:14, 333:16, 348:11, 370:15, 429:23 hearsay [7] - 410:6, 410:16, 414:20, 416:1, 416:2, 417:5, 418:17 heat [1] - 429:9 heaven [1] - 445:20 height [3] - 282:22, 366:22, 505:17 held [1] - 252:2 hello [1] - 508:19 help [9] - 265:11, 272:8, 273:16, 293:12, 293:15, 390:20, 396:8, 438:10, 444:20 helpful [2] - 288:3, 389:14 helping [1] - 273:15 hemispherical [1] - 516:18 HEREBY [1] - 522:8 Heritage [1] - 387:4 hertz [5] - 303:22, 303:25, 304:6, 505:9, 506:11 HESSLER [1] - 256:3 Hessler [24] - 260:7, 260:8, 260:9, 274:15, 274:17, 274:21, 275:8, 275:14, 275:22, 302:15, 351:7, 493:21, 494:4, 494:8, 494:10, 494:13, 494:17, 497:15, 508:13, 508:18, 514:2, 515:20, 520:23, 521:17 Hessler's [1] - 364:21 HH [2] - 259:11, 259:11	hi [4] - 355:21, 508:18, 512:2, 512:3 Hidewood [1] - 387:1 high [13] - 288:22, 288:24, 289:2, 303:25, 328:6, 328:18, 328:22, 331:5, 381:8, 506:8, 513:3, 516:24 higher [12] - 288:13, 298:16, 312:23, 319:10, 319:11, 336:20, 379:7, 476:7, 477:4, 499:3, 499:17, 505:11 highest [2] - 265:13, 474:14 highly [3] - 500:23, 503:9, 513:6 highway [3] - 312:4, 384:14, 385:3 HILARY [1] - 256:10 Hilary [1] - 261:13 himself [1] - 426:9 hire [1] - 513:19 hired [1] - 320:1 Historic [1] - 377:6 historical [1] - 386:17 Historical [2] - 259:21, 259:23 historically [2] - 399:16, 466:10 history [2] - 461:1, 471:20 hit [1] - 339:12 hits [3] - 338:16, 339:14, 339:21 hoist [1] - 429:8 hold [4] - 285:4, 333:20, 333:25, 439:14 home [50] - 278:11, 289:6, 292:13, 306:18, 307:2, 307:8, 307:18, 307:22, 308:4, 308:10, 324:24, 325:5, 325:9, 338:6, 338:14, 339:7, 339:13, 339:18, 341:11, 341:17, 341:20, 341:21, 341:24, 342:5, 342:8, 342:15, 342:21, 342:25, 343:4, 343:7, 343:14, 343:15, 355:14, 365:2, 367:24, 368:13, 368:16, 369:18,	372:13, 441:3, 441:5, 458:11, 472:12, 473:22, 475:25, 476:3, 477:13 home's [1] - 337:24 homeowners [1] - 365:15 homes [21] - 280:10, 290:25, 319:11, 334:25, 335:2, 350:11, 351:17, 365:12, 365:15, 368:1, 368:24, 370:16, 370:21, 455:15, 460:9, 460:12, 472:25, 482:23, 506:15, 507:1, 509:3 honest [2] - 473:10, 481:20 honestly [3] - 435:5, 435:13, 445:18 honored [1] - 459:13 hopefully [4] - 262:13, 402:18, 423:8, 423:9 horse [1] - 290:23 Hospital [1] - 321:22 host [1] - 451:3 hour [2] - 353:24, 367:7 hours [35] - 263:11, 263:13, 264:18, 265:2, 265:13, 265:20, 266:3, 274:3, 274:7, 329:12, 330:7, 334:25, 348:11, 349:20, 350:10, 350:25, 351:22, 353:4, 353:19, 354:3, 354:11, 354:25, 355:3, 359:9, 359:13, 359:25, 360:3, 360:4, 360:6, 360:23, 361:1, 370:16, 370:18, 444:14, 444:15 house [45] - 263:12, 263:18, 270:16, 272:1, 278:3, 278:5, 278:9, 278:11, 278:17, 279:4, 279:15, 279:21, 279:24, 289:12, 292:21, 295:8, 335:14, 338:19, 338:25, 339:5, 339:11, 339:12,	339:14, 339:17, 339:18, 339:21, 339:22, 339:25, 342:5, 342:6, 343:10, 429:6, 429:11, 429:13, 435:17, 440:25, 467:5, 475:10, 475:21, 476:7, 506:2, 507:4, 515:5 houses [5] - 293:17, 295:10, 338:15, 468:23, 507:7 hub [2] - 282:22, 505:17 Hubner [1] - 336:5 Hueck [1] - 251:14 human [1] - 266:12 hung [1] - 432:21 husband [1] - 437:23 hybridization [1] - 350:22 hydrologic [1] - 387:18 hypothetical [3] - 320:6, 330:13, 353:25	410:9, 455:17, 19 456:6, 456:9, 456:12, 460:22, 461:3, 463:17, 464:9, 464:10, 464:14, 465:4, 466:23, 467:1, 474:6, 475:13, 477:24, 478:7, 478:8, 481:5, 491:3 Identify [1] - 258:21 identify [7] - 388:23, 390:11, 391:6, 394:9, 463:20, 464:4, 495:12 identifying [3] - 297:19, 404:20, 464:2 ifs [1] - 405:4 ignored [1] - 374:3 II [55] - 251:4, 251:9, 251:17, 259:6, 259:7, 259:8, 259:9, 259:22, 262:4, 262:22, 276:15, 277:11, 283:25, 284:5, 285:7, 291:11, 291:22, 291:25, 293:19, 297:4, 301:13, 302:16, 314:2, 314:12, 314:17, 314:21, 321:24, 323:1, 333:10, 333:11, 333:12, 334:7, 334:22, 337:5, 356:21, 357:7, 375:12, 375:15, 379:20, 383:17, 385:18, 386:18, 391:11, 393:22, 395:13, 438:6, 438:8, 440:7, 440:8, 483:20, 492:9, 492:10, 510:2, 510:11, 520:2 II's [1] - 395:1 III [1] - 492:10 illustrate [1] - 517:17 image [1] - 293:3 imagine [1] - 267:19 immediate [1] - 468:1 immediately [2] - 506:1, 506:4 impact [20] - 264:3, 301:21, 329:19, 329:20, 358:10, 358:19, 360:1, 360:18, 361:2, 361:3, 370:7,
--	---	---	--	---

392:20, 408:6, 452:20, 455:12, 460:8, 488:9, 494:20, 513:14 Impact [2] - 258:7, 259:13 impacted [2] - 402:24, 408:23 impacting [1] - 367:1 impacts [13] - 274:6, 329:13, 368:19, 368:20, 369:3, 377:10, 378:5, 378:6, 378:10, 380:17, 380:23, 391:12, 520:16 impairing [1] - 367:1 impartial [1] - 494:23 impetus [1] - 351:3 implement [1] - 393:23 imply [1] - 421:8 importance [1] - 517:17 important [9] - 265:21, 282:15, 299:4, 323:11, 349:2, 373:15, 396:5, 396:9, 405:8 importantly [1] - 448:12 imported [1] - 351:4 imposed [2] - 337:3, 337:4 impossible [2] - 315:12, 428:1 impressed [3] - 468:11, 469:17, 469:21 improve [2] - 496:20, 502:23 improved [1] - 475:19 improvement [1] - 509:24 improvements [2] - 429:5, 475:4 IN [2] - 251:4, 251:5 in-field [1] - 513:16 inaccurate [1] - 268:6 inaudible [11] - 303:20, 303:23, 304:7, 304:8, 304:16, 305:6, 305:24, 307:9, 307:12, 329:5, 385:11 INCE [1] - 367:18 Inch [1] - 328:14 Incl [1] - 258:12 include [25] - 279:3,	284:17, 284:24, 286:1, 286:7, 291:3, 293:17, 295:4, 295:6, 296:21, 297:19, 306:3, 318:22, 347:10, 347:11, 357:16, 376:8, 377:13, 377:25, 380:6, 383:8, 395:12, 398:13, 418:9, 447:5 included [25] - 262:18, 262:21, 262:24, 276:20, 277:4, 283:20, 285:9, 286:8, 286:10, 290:6, 291:10, 291:23, 293:24, 326:14, 327:18, 352:14, 371:14, 413:4, 422:22, 457:20, 458:20, 460:19, 465:5, 478:1, 490:20 includes [4] - 296:22, 326:11, 382:4, 400:8 Including [1] - 259:16 including [14] - 290:11, 301:22, 322:22, 348:7, 358:21, 375:18, 375:25, 377:4, 385:11, 393:4, 393:10, 394:4, 394:8, 505:8 incoherent [1] - 270:22 inconsistent [1] - 404:4 incorporate [1] - 496:10 incorrectly [1] - 412:16 increase [5] - 309:17, 329:22, 470:24, 476:16, 476:24 increased [1] - 328:10 increasing [2] - 287:24, 510:17 incredible [1] - 403:11 independent [3] - 303:8, 303:13, 318:3 indicate [1] - 401:20 indicated [6] - 281:24, 297:18, 328:9, 335:11, 345:2, 434:11 indicates [1] - 334:21 indicating [3] - 296:19, 308:20,	379:6 indicating [4] - 431:3, 431:8, 437:2, 440:18 individual [4] - 264:1, 264:2, 280:23, 364:7 individuals [3] - 316:2, 336:25, 410:10 industry [3] - 328:6, 403:21, 449:18 inert [1] - 358:4 influence [10] - 320:7, 456:11, 458:9, 470:12, 471:25, 485:25, 486:1, 489:25, 492:13, 515:8 influenced [3] - 455:23, 457:12, 468:1 influences [2] - 455:14, 474:19 informal [1] - 354:22 informally [1] - 405:5 Information [1] - 258:21 information [17] - 281:17, 291:4, 305:5, 318:11, 327:18, 386:16, 387:3, 391:10, 454:24, 457:18, 457:19, 458:15, 458:20, 461:15, 470:3, 485:14, 488:4 information's [1] - 281:19 informational [1] - 346:21 informative [2] - 420:21, 421:8 informed [1] - 419:25 infrasound [39] - 301:16, 303:1, 303:18, 303:20, 303:21, 304:1, 304:3, 304:5, 304:16, 305:5, 305:21, 305:24, 306:20, 306:24, 307:6, 307:9, 307:11, 307:13, 307:16, 307:21, 308:2, 308:4, 308:7, 314:14, 317:3, 317:7, 317:9, 317:14, 328:24, 329:4, 357:8, 357:13, 357:19, 364:25, 385:12,	511:10, 512:10, 512:11, 512:12 Infrasound [7] - 257:19, 258:11, 258:12, 259:16, 259:17, 259:18, 260:21 infrastructure [4] - 377:25, 380:20, 451:4, 453:13 initial [3] - 351:7, 354:8, 471:3 initiated [1] - 326:15 input [1] - 501:23 Input [1] - 257:22 inquiry [1] - 340:10 insects [1] - 313:5 inside [14] - 278:22, 279:15, 279:21, 307:7, 307:18, 308:4, 339:13, 339:18, 341:20, 341:24, 343:7, 343:14, 368:12, 368:13 inspected [1] - 466:1 inspection [1] - 489:12 Installations [1] - 258:10 instance [2] - 328:15, 470:16 instantly [2] - 344:12, 344:15 instead [2] - 297:25, 335:22 instilling [1] - 400:15 Institute [1] - 452:25 institute [1] - 367:19 instrumental [1] - 359:2 instrumentation [2] - 315:24, 512:17 instruments [1] - 512:19 insulated [1] - 429:6 insulation [1] - 429:9 intended [2] - 443:24, 507:13 intensity [5] - 270:22, 271:5, 271:10, 272:3, 272:15 Intensive [1] - 377:21 intent [3] - 414:22, 414:23, 520:15 intention [2] - 419:20, 419:22 interaction [5] - 285:17, 285:19, 285:20, 285:22,	286:10 20 Interconnection [1] - 258:23 interest [4] - 355:9, 355:11, 471:3, 507:5 interested [6] - 320:17, 448:4, 448:5, 448:21, 448:22, 464:22 interesting [9] - 270:8, 300:9, 399:14, 410:17, 461:2, 465:22, 467:8, 488:11, 488:15 interference [2] - 434:21, 505:24 interior [1] - 306:18 interject [1] - 290:17 intermix [1] - 366:14 internal [1] - 322:9 International [3] - 323:6, 324:20, 453:5 internationally [1] - 341:12 interpretation [2] - 370:5, 480:13 interrupting [1] - 289:15 interstate [12] - 279:8, 279:12, 279:13, 312:6, 343:18, 343:23, 344:1, 344:10, 384:5, 384:7, 384:17, 384:24 intervening [1] - 506:4 intervenor [3] - 457:18, 458:14, 458:17 Intervenor [9] - 260:9, 260:12, 261:7, 261:7, 261:8, 261:8, 261:9, 294:10, 465:1 Intervenor's [11] - 251:19, 276:12, 291:13, 318:6, 409:22, 427:7, 440:9, 440:10, 480:25, 487:14, 497:15 Intervenor's [2] - 261:5, 296:19 INTERVENORS [2] - 255:9, 260:15 intervention [1] - 427:3 interview [11] - 455:19, 457:6, 462:10, 462:13, 470:10, 470:15,
--	--	---	---	---

475:9, 476:2, 484:23, 485:11, 485:17 interviewed [8] - 457:8, 457:9, 457:10, 462:22, 467:3, 487:3, 491:12 interviewing [1] - 486:10 interviews [1] - 472:10 introduced [2] - 322:22, 426:9 intuition [1] - 404:4 intuitively [1] - 268:5 Inventory [1] - 259:22 investigate [4] - 340:6, 391:11, 457:2, 476:1 investigated [1] - 489:23 investigation [2] - 486:4, 486:9 investigators [1] - 327:11 involved [5] - 282:24, 309:19, 388:21, 468:22, 494:22 IR [1] - 260:12 ISO [5] - 280:18, 289:22, 295:4, 295:6, 503:25 isolated [1] - 497:4 isolating [1] - 306:10 isopleth [1] - 338:9 issue [8] - 285:15, 320:11, 387:13, 403:11, 407:17, 448:13, 462:19, 479:4 issued [1] - 347:16 issues [9] - 301:16, 322:2, 323:16, 327:5, 331:15, 387:17, 500:24, 501:24, 506:20 item [3] - 307:11, 331:13, 399:8 items [5] - 278:9, 398:9, 422:22, 424:16, 439:25 iterative [1] - 380:3 itself [23] - 306:12, 307:20, 315:20, 335:18, 338:7, 339:12, 339:15, 340:6, 342:11, 342:22, 343:11, 343:14, 351:14, 358:7, 365:9, 365:10, 365:19,	366:20, 368:17, 372:7, 373:11, 512:12, 515:9 J January [7] - 302:3, 334:11, 345:21, 376:11, 454:22, 457:2, 507:16 Japanese [1] - 317:9 Jay [4] - 257:12, 259:5, 260:6, 273:12 JAY [1] - 254:3 JE-1 [1] - 465:9 Jefferson [1] - 322:8 JH-R-1 [1] - 260:7 JH-R-2 [1] - 260:8 JH-R-3 [1] - 260:9 JH-S-1 [1] - 259:6 JH-S-2 [1] - 259:7 JH-S-3 [1] - 259:8 JH-S-4 [1] - 259:9 job [8] - 452:14, 452:18, 452:19, 468:20, 469:17, 469:20, 494:15, 494:18 jobs [2] - 484:10, 484:15 Joe [1] - 252:3 joinder [3] - 414:6, 414:25, 418:8 joining [1] - 301:23 joint [1] - 508:24 Jonas [1] - 362:24 journal [1] - 319:23 Judge [2] - 419:14, 419:18 judge [1] - 346:17 judge's [2] - 347:12, 347:14 judgment [1] - 286:5 judicially [1] - 419:11 July [7] - 302:2, 313:8, 376:7, 436:5, 436:6, 436:7, 436:13 jump [2] - 384:5, 475:17 jumped [2] - 476:20, 476:21 jumping [1] - 476:8 junction [1] - 444:25 junior's [1] - 294:4 jurisdiction [2] - 348:9, 354:7 jurisdictions [4] - 350:6, 350:13, 355:4, 355:6	K Kaitlyn [1] - 251:15 karen [1] - 251:13 KEARNEY [1] - 256:13 Kearney [4] - 261:12, 261:12, 394:24, 404:3 Kearney's [2] - 397:4, 406:12 keep [8] - 330:6, 383:3, 401:16, 402:17, 412:4, 484:23, 484:24, 521:6 keeping [1] - 404:7 kept [2] - 475:9, 486:9 key [3] - 304:25, 332:9, 332:15 kidding [3] - 450:15, 450:16 Kiel [1] - 362:15 KIEL [1] - 362:15 kilometer [2] - 284:24, 293:23 kilometers [11] - 284:15, 284:18, 284:22, 291:12, 291:14, 293:20, 297:20, 297:25, 298:8, 298:25, 299:6 kind [28] - 264:24, 281:25, 285:4, 338:6, 344:3, 345:15, 350:1, 350:19, 354:22, 370:12, 383:3, 401:7, 407:23, 430:25, 434:4, 466:12, 468:21, 483:1, 485:14, 486:5, 488:14, 492:18, 504:13, 505:5, 509:18, 512:5, 518:4, 519:22 kinds [2] - 304:5, 379:16 kitchen [3] - 267:3, 342:3, 505:20 Knopper [1] - 346:2 knowing [1] - 401:16 knowledge [18] - 280:9, 288:4, 288:5, 311:21, 311:22, 311:23, 340:7, 341:4, 343:13, 351:20, 351:21, 357:18, 386:15, 400:3, 454:24, 495:22, 506:19,	519:4 known [4] - 378:8, 379:23, 392:7, 393:5 Kranz [10] - 260:17, 413:16, 413:19, 413:22, 425:13, 425:16, 425:25, 426:18, 431:5, 438:12 Kranz's [3] - 426:22, 435:17, 436:11 Kranzburg [2] - 436:5, 436:6 Kristen [3] - 251:23, 414:4, 451:20 Kristie [2] - 300:15, 340:12 KRISTIE [1] - 251:12 L lab [1] - 363:6 Lab [1] - 372:12 laboratory [3] - 336:3, 362:9, 362:14 Laboratory [1] - 368:11 laid [1] - 294:9 lake [1] - 379:2 lakes [3] - 288:16, 379:15, 379:22 LAMPETER [1] - 254:10 Lampeter [11] - 257:16, 257:17, 260:10, 300:24, 301:5, 301:10, 302:24, 313:25, 316:13, 346:5, 346:9 Lampeter's [1] - 346:15 Land [4] - 259:9, 260:4, 376:24, 380:12 land [16] - 332:12, 350:1, 358:17, 370:8, 370:10, 370:13, 370:21, 426:9, 432:10, 432:11, 432:12, 438:6, 438:9, 438:11, 438:18, 448:25 Land-Based [2] - 376:24, 380:12 landfill [4] - 358:6, 358:7, 358:11, 358:14 landowner [3] - 386:3, 386:9, 386:10	landowners [2] - 21 444:10, 468:20 landscape [2] - 336:20, 492:19 language [2] - 409:19, 411:15 Laretta [6] - 260:17, 425:13, 425:18, 426:19, 428:12, 431:5 large [5] - 289:6, 356:17, 373:24, 484:10, 503:15 larger [2] - 412:1, 498:12 largest [1] - 327:9 last [20] - 262:6, 267:21, 275:2, 333:23, 334:2, 334:21, 340:21, 348:10, 349:14, 352:20, 352:25, 382:18, 385:15, 392:11, 416:24, 423:25, 427:25, 451:23, 507:8, 514:13 late [5] - 333:12, 344:8, 348:19, 422:17, 433:12 latest [2] - 274:16, 323:5 latitude [1] - 414:14 laughed [1] - 426:14 law [5] - 348:4, 419:1, 419:10, 433:25, 517:2 Lawrence [13] - 261:15, 261:16, 336:3, 368:11, 372:12, 452:6, 452:10, 452:12, 459:4, 459:17, 482:7, 489:6, 493:15 LAWRENCE [1] - 255:20 laws [2] - 377:1, 377:2 lawyer [5] - 370:17, 410:25, 412:6, 417:9, 418:21 lawyers [1] - 423:16 lay [3] - 292:24, 409:24, 409:25 layer [1] - 268:22 layout [4] - 364:17, 440:24, 497:20, 497:21 lazy [2] - 342:1, 342:11 LCD [1] - 315:16
--	--	--	---	---

leaches ^[1] - 358:4 lead ^[9] - 294:12, 324:8, 324:14, 324:16, 335:17, 362:16, 363:24, 374:6 leading ^[1] - 429:20 leads ^[1] - 374:5 leaned ^[1] - 416:22 learn ^[1] - 465:17 learned ^[1] - 481:19 learning ^[1] - 317:22 lease ^[3] - 425:19, 433:2, 438:13 Lease ^[1] - 260:16 leased ^[2] - 358:15, 358:17 least ^[4] - 318:15, 327:6, 354:24, 505:4 leave ^[3] - 340:16, 441:23, 445:20 leaves ^[1] - 268:7 leaving ^[1] - 418:14 led ^[1] - 334:2 left ^[3] - 272:3, 294:24, 365:15 legal ^[18] - 370:4, 409:23, 409:25, 411:20, 411:21, 411:24, 412:5, 415:13, 416:11, 418:17, 419:1, 419:24, 431:23, 458:7, 479:16, 480:3, 480:14 legitimate ^[1] - 474:19 lek ^[1] - 377:17 length ^[1] - 475:1 Lennox ^[1] - 459:9 less ^[16] - 268:25, 271:19, 274:6, 279:22, 308:5, 315:16, 327:23, 330:7, 360:5, 369:17, 374:9, 412:13, 430:4, 502:19, 510:25, 517:15 letter ^[5] - 347:3, 347:8, 389:22, 390:7, 390:21 Letter ^[6] - 257:19, 257:20, 257:21, 259:21, 259:23 Level ^[5] - 257:8, 259:8, 259:17, 377:20, 377:21 level ^[48] - 266:23, 267:3, 295:10, 298:3, 298:10, 303:25, 304:13, 305:15, 309:1, 309:17, 310:2, 310:5, 310:21, 313:6, 318:22, 319:8, 328:24, 330:3, 330:11, 331:4, 332:9, 351:16, 369:6, 370:14, 371:16, 435:1, 442:17, 447:6, 447:18, 448:9, 461:22, 461:23, 462:5, 500:15, 501:5, 503:12, 503:17, 503:18, 510:17, 510:25, 513:3, 513:9, 514:7, 515:5, 515:16, 517:23, 517:24, 520:18 levels ^[40] - 266:14, 303:21, 304:6, 308:4, 309:5, 311:25, 312:22, 312:25, 316:23, 316:24, 318:24, 318:25, 327:19, 327:22, 328:6, 328:17, 328:18, 329:11, 331:8, 332:13, 336:15, 336:17, 336:19, 339:6, 369:5, 444:18, 447:9, 448:16, 496:18, 499:3, 499:17, 500:15, 502:10, 503:5, 503:16, 507:7, 510:18, 510:20, 512:25, 513:8 LFN ^[1] - 303:1 licensed ^[2] - 358:6, 358:14 Life ^[1] - 258:13 life ^[2] - 397:14, 448:3 lifting ^[1] - 510:18 light ^[17] - 263:8, 271:5, 271:6, 271:16, 271:17, 271:19, 271:24, 272:10, 342:1, 342:7, 343:16, 344:22, 370:8, 370:9, 370:13, 370:21, 434:19 lighter ^[1] - 312:23 lighting ^[1] - 336:20 lights ^[2] - 363:7, 372:17 likelihood ^[3] - 336:25, 402:4, 501:3 likely ^[4] - 287:7, 499:4, 499:20, 500:25 limit ^[21] - 274:2, 274:6, 293:23, 341:16, 347:5, 349:20, 349:25, 350:7, 354:24, 360:5, 360:20, 360:22, 361:4, 367:4, 369:5, 500:19, 500:20, 502:18, 519:12, 521:1 limitation ^[1] - 315:19 limited ^[5] - 359:21, 362:18, 430:1, 473:25, 483:17 limiting ^[2] - 343:9, 359:17 limits ^[3] - 330:14, 354:7, 466:19 line ^[25] - 266:13, 276:11, 279:18, 289:12, 289:14, 297:1, 297:2, 303:7, 341:3, 364:16, 364:23, 385:17, 416:3, 416:10, 416:15, 418:11, 428:14, 497:19, 499:1, 499:5, 499:10 lines ^[10] - 273:21, 280:18, 289:22, 338:9, 412:19, 415:24, 416:3, 416:14, 416:25, 418:10 linked ^[1] - 335:12 List ^[1] - 260:5 list ^[8] - 390:16, 391:8, 443:25, 444:2, 496:24, 504:9, 504:19, 504:23 listed ^[9] - 290:5, 390:15, 391:8, 414:25, 443:23, 456:17, 463:11, 463:13, 476:8 listen ^[4] - 328:15, 420:7, 428:20, 478:16 listened ^[3] - 485:2, 485:4, 516:1 listening ^[6] - 308:12, 330:21, 331:1, 331:12, 421:3, 503:13 listing ^[3] - 464:21, 465:14, 486:22 listings ^[4] - 463:19, 464:1, 464:12, 466:9 lists ^[1] - 463:23 literature ^[15] - 288:7, 326:21, 327:10, 329:3, 335:24, 337:2, 342:12, 343:6, 345:23, 357:19, 368:6, 368:23, 369:8, 393:4, 398:6 Literature ^[1] - 258:16 live ^[14] - 270:15, 275:21, 295:14, 325:5, 355:13, 431:1, 435:17, 439:12, 456:22, 477:10, 481:25, 484:12, 484:14, 501:4 lived ^[4] - 371:6, 400:24, 472:12, 472:16 lives ^[2] - 431:5, 440:15 Living ^[1] - 258:14 living ^[15] - 323:2, 327:6, 335:10, 335:17, 335:21, 336:13, 342:13, 358:11, 371:12, 429:14, 458:5, 467:12, 470:17, 473:20, 493:1 LLC ^[2] - 251:4, 262:4 LLC's ^[2] - 257:19, 257:20 LNTE ^[1] - 277:4 local ^[9] - 312:6, 312:7, 341:14, 361:6, 377:6, 377:22, 408:4, 408:13, 447:22 localized ^[1] - 349:5 located ^[10] - 276:16, 278:3, 301:6, 301:11, 366:21, 384:13, 434:22, 464:8, 467:16, 479:7 location ^[12] - 264:3, 276:18, 293:12, 298:11, 349:16, 456:20, 457:14, 464:5, 473:24, 481:21, 483:15, 520:8 locations ^[6] - 276:22, 280:13, 496:23, 22 497:1, 497:4, 498:22 Locations ^[1] - 260:5 logarithmic ^[4] - 287:25, 298:5, 308:25, 309:18 logical ^[1] - 397:18 look ^[54] - 266:6, 271:16, 286:16, 290:8, 292:18, 293:24, 296:16, 304:25, 309:2, 309:3, 332:7, 340:17, 347:1, 349:8, 351:10, 351:23, 356:18, 359:21, 361:18, 367:5, 368:14, 368:22, 372:8, 373:3, 380:5, 380:11, 380:16, 382:6, 382:7, 392:25, 400:6, 402:10, 403:24, 403:25, 404:25, 428:13, 438:16, 459:17, 461:12, 463:24, 464:8, 466:6, 466:9, 474:5, 480:6, 485:7, 491:22, 492:2, 492:16, 496:7, 505:20 looked ^[24] - 264:1, 284:3, 285:1, 312:18, 324:21, 327:11, 343:21, 359:22, 382:12, 383:14, 390:2, 391:17, 403:4, 455:21, 455:23, 460:8, 460:9, 464:16, 465:14, 489:21, 490:25, 491:10, 491:23, 514:12 looking ^[38] - 278:17, 288:15, 290:13, 295:8, 296:18, 297:2, 317:18, 327:16, 333:14, 341:13, 342:13, 343:2, 348:24, 350:20, 352:17, 354:15, 356:10, 368:5, 372:18, 374:10, 378:25, 379:22, 383:5, 383:24, 386:7, 389:17, 391:23,
--

395:23, 402:8, 403:22, 415:23, 416:5, 475:3, 476:6, 476:15, 484:24, 502:22 looks [5] - 316:25, 317:6, 352:18, 415:25, 417:3 loose [1] - 414:16 loosely [1] - 354:8 lose [2] - 477:2, 477:3 losing [2] - 486:25, 521:6 loss [5] - 405:8, 476:17, 506:5, 516:19, 516:20 lost [2] - 436:1, 477:2 loud [4] - 308:23, 309:11, 309:13, 362:6 louder [2] - 328:15, 498:15 loudness [1] - 309:4 love [2] - 434:6, 436:6 low [26] - 298:3, 301:16, 303:25, 306:7, 306:13, 306:16, 306:20, 306:24, 306:25, 307:21, 308:2, 314:13, 317:3, 317:9, 317:13, 336:17, 344:1, 357:8, 357:14, 357:19, 364:25, 385:11, 504:14, 510:3, 510:5, 511:10 Low [6] - 257:18, 258:11, 258:12, 259:16, 259:18, 260:21 Low-Frequency [2] - 258:12, 259:16 lower [9] - 277:2, 277:5, 298:11, 298:13, 312:14, 313:3, 500:22, 507:11, 512:6 lunch [2] - 374:24, 387:12 Lyndon [1] - 301:24	mailed [1] - 487:4 Main [1] - 251:25 main [2] - 351:3, 429:14 maintain [1] - 519:11 maintained [3] - 475:10, 500:16, 521:1 major [4] - 307:21, 327:3, 329:20, 515:8 majority [1] - 392:6 man [4] - 429:8, 485:8, 486:5, 486:19 manage [3] - 301:7, 301:12, 375:24 managed [2] - 387:4, 486:2 management [3] - 333:9, 376:2, 378:9 managing [1] - 375:19 mandates [1] - 414:7 manufacturer [3] - 319:5, 319:9, 454:4 manufacturing [1] - 328:8 map [16] - 284:4, 285:1, 286:16, 288:15, 294:13, 295:4, 296:14, 296:15, 296:18, 296:19, 297:3, 312:8, 378:22, 431:1, 461:9, 464:6 Map [3] - 260:4, 260:13, 260:13 Maps [1] - 259:3 maps [8] - 279:23, 280:16, 289:21, 292:18, 293:24, 295:6, 295:8, 440:10 March [3] - 348:14, 390:24, 390:25 Mark [5] - 257:13, 257:13, 259:12, 260:11, 509:17 MARK [1] - 253:17 marked [15] - 273:13, 295:16, 302:2, 302:4, 376:8, 376:10, 376:12, 424:16, 424:24, 425:23, 439:17, 440:20, 453:19, 454:15, 495:24 market [29] - 452:20, 455:12, 458:4, 459:24, 460:3, 460:8, 464:15, 470:21, 471:12, 471:13, 471:15,	471:17, 471:25, 472:10, 473:7, 474:22, 475:18, 477:10, 477:14, 479:21, 482:18, 482:22, 483:19, 484:8, 488:9, 490:24, 491:5, 492:13 Market [1] - 259:13 marketplace [1] - 471:14 MAROUS [1] - 253:13 MaRous [7] - 259:12, 260:10, 407:15, 407:17, 478:17, 482:5, 485:1 married [1] - 437:22 Mary [1] - 308:9 mask [1] - 299:10 Massachusetts [2] - 301:7, 301:12 master [1] - 322:6 master's [2] - 333:21, 376:3 match [2] - 269:13, 464:5 material [5] - 358:5, 480:7, 480:13, 481:2, 486:23 materials [1] - 268:4 math [1] - 284:9 matter [21] - 252:2, 262:3, 283:11, 286:5, 288:24, 288:25, 338:18, 339:5, 339:11, 350:4, 356:12, 410:19, 411:5, 415:9, 435:9, 444:3, 474:12, 481:8, 501:8, 515:10, 522:10 MATTER [1] - 251:4 matters [3] - 411:21, 412:10, 441:10 Matthew [1] - 252:2 maximum [2] - 304:22, 384:1 Maynard [2] - 301:6, 301:11 MCCOMSEY [1] - 522:5 McComsey [3] - 251:24, 522:17, 522:18 McCunney [9] - 259:13, 306:4, 321:12, 321:15, 321:21, 323:19,	335:11, 361:13, 368:8 MCCUNNEY [1] - 254:14 McDonald [1] - 426:7 McDonaldson [2] - 425:19, 426:9 McPherson [1] - 260:22 mean [30] - 269:19, 281:4, 281:15, 285:13, 300:9, 328:6, 329:15, 347:19, 351:5, 353:21, 356:10, 357:2, 358:2, 367:4, 385:24, 400:16, 401:4, 421:3, 421:7, 421:17, 423:2, 471:13, 472:6, 477:12, 483:1, 492:11, 503:16, 503:18, 517:24 meaning [4] - 328:5, 353:24, 416:3, 417:15 means [6] - 279:2, 353:12, 427:17, 434:18, 463:8, 514:18 meant [1] - 471:13 measurable [5] - 307:23, 456:3, 467:15, 471:18, 485:23 measure [9] - 284:10, 296:2, 304:6, 304:21, 461:24, 461:25, 503:14, 506:10, 520:6 measured [9] - 267:8, 269:14, 304:23, 316:23, 318:24, 325:1, 327:14, 512:18, 517:24 measurement [7] - 269:21, 296:5, 304:9, 311:9, 332:9, 466:21, 512:17 Measurement [2] - 259:17, 260:21 measurements [9] - 269:19, 296:6, 305:11, 310:7, 310:8, 311:11, 311:13, 311:22, 512:25 Measures [2] - 258:4, 258:9 measures [3] -	327:12, 377:25, 23 496:15 measuring [1] - 515:6 mechanical [3] - 267:19, 269:16, 306:19 media [1] - 319:25 medical [7] - 322:8, 322:10, 328:3, 329:3, 355:25, 361:7, 426:22 medically [1] - 413:22 medicine [2] - 322:9, 322:12 meet [3] - 425:20, 468:22, 502:18 meeting [1] - 433:14 meetings [4] - 367:21, 433:10, 433:11, 433:12 meets [1] - 334:22 megawatt [4] - 265:11, 265:22, 427:23 megawatts [2] - 274:1, 498:16 Meierhenry [2] - 459:11, 459:12 member [2] - 367:18, 457:5 members [2] - 365:23, 366:1 memory [1] - 390:3 mention [7] - 306:6, 306:7, 307:13, 360:12, 360:13, 425:11, 465:9 mentioned [9] - 272:16, 290:9, 383:19, 392:14, 393:20, 426:12, 458:14, 487:7, 502:8 mentioning [1] - 305:2 mentions [1] - 346:15 menus [1] - 315:18 merely [1] - 343:3 met [2] - 459:7, 465:15 metal [1] - 315:21 meteorological [1] - 353:15 Meteorological [2] - 258:19, 259:19 meter [10] - 282:22, 289:19, 338:20, 338:21, 339:15, 382:7, 382:9, 505:17, 515:6 meters [1] - 272:21 methodology [3] - 488:14, 514:25,
M				
ma'am [1] - 340:14 machines [1] - 308:3 Machining [1] - 429:9 magistrate [1] - 419:13 MAI [1] - 453:1				

515:1 metric [1] - 332:14 Meyer [1] - 493:25 MICHAEL [1] - 253:13 Michael [2] - 259:12, 260:10 mid-2000s [1] - 350:19 middle [3] - 270:1, 270:5, 270:20 midst [1] - 262:7 Midwest [2] - 375:25, 453:13 might [24] - 266:6, 293:3, 305:6, 330:8, 331:21, 355:8, 380:18, 382:12, 390:20, 402:13, 402:14, 402:18, 410:24, 450:21, 460:17, 464:16, 466:12, 476:17, 477:2, 478:2, 493:21, 499:4, 503:6, 509:5 migrate [1] - 399:3 migration [9] - 381:4, 381:6, 381:7, 381:25, 382:10, 383:3, 383:8, 392:15, 398:22 migratory [19] - 392:4, 392:7, 392:8, 392:14, 392:17, 392:20, 393:6, 394:17, 398:5, 398:7, 398:11, 398:12, 398:17, 399:3, 399:16, 400:20, 401:11, 403:17, 405:1 Milbank [1] - 467:18 mile [14] - 272:22, 292:16, 293:13, 293:14, 294:6, 325:2, 325:5, 325:8, 332:5, 431:4, 431:6, 520:8 mileage [1] - 467:21 miles [26] - 284:2, 284:6, 284:7, 285:5, 285:10, 285:12, 285:16, 285:18, 285:19, 285:21, 286:2, 286:13, 292:20, 297:24, 297:25, 298:7, 332:5, 378:8, 379:25, 384:13, 387:2, 388:25, 392:5, 392:12,	393:16, 405:3 Miles [3] - 251:17, 413:15, 440:9 Miles's [1] - 423:3 military [1] - 333:23 million [1] - 504:17 millions [2] - 357:25, 405:7 mind [8] - 401:16, 402:18, 418:1, 424:17, 436:22, 437:5, 446:1, 489:22 mine [3] - 316:12, 428:18, 516:13 minimal [1] - 380:23 minimis [1] - 435:3 minimization [2] - 377:10, 377:24 minimize [1] - 281:12 minimizing [1] - 378:5 minimum [2] - 266:4, 310:15 Minnesota [11] - 322:7, 351:9, 351:13, 351:22, 351:23, 367:3, 367:6, 367:8, 500:3, 500:8, 507:18 Minnesota/South [1] - 467:22 minor [7] - 403:12, 410:15, 411:22, 505:13, 505:15, 516:21, 516:25 minus [3] - 319:4, 319:6, 503:21 minute [12] - 274:11, 289:3, 289:25, 361:21, 362:16, 390:3, 392:1, 403:22, 418:2, 436:23, 439:14, 445:24 minutes [18] - 264:19, 265:20, 266:3, 274:3, 342:4, 349:22, 350:14, 351:1, 359:25, 360:14, 362:14, 362:16, 362:18, 363:8, 363:13, 363:16, 409:11, 467:23 misidentified [1] - 455:3 mismanaged [2] - 486:20, 486:25 miss [1] - 432:3 missed [2] - 465:5, 476:12	misstated [2] - 273:1, 454:4 mistaken [1] - 422:24 miswrote [1] - 499:13 mitigating [1] - 496:15 mitigation [2] - 377:10, 377:25 mix [1] - 476:14 mixes [2] - 385:19, 386:8 MLS [8] - 456:18, 464:11, 465:11, 465:13, 467:6, 473:18, 474:8, 475:20 MM-S-1 [1] - 259:13 MN-buyout-20186-143575-01 [1] - 261:6 mode [1] - 338:18 model [20] - 280:2, 283:2, 283:3, 283:4, 284:15, 284:17, 314:18, 318:17, 318:22, 318:25, 319:6, 337:24, 338:5, 338:14, 338:16, 340:3, 340:5, 340:6, 353:25, 503:17 modeled [1] - 319:10 modeling [14] - 263:10, 314:3, 314:13, 314:17, 318:18, 318:20, 337:20, 337:22, 371:10, 510:16, 510:22, 510:24, 513:16, 513:17 Modeling [2] - 257:8, 257:9 modelled [2] - 260:7, 260:8 mold [1] - 419:16 moment [1] - 345:19 momentary [1] - 361:22 monitor [2] - 394:10, 405:5 monitored [1] - 358:7 monitoring [4] - 336:10, 363:22, 377:19, 488:7 Monitoring [2] - 258:14, 336:6 Montana [2] - 268:16, 268:25 months [4] - 382:8, 487:22, 508:5 moon [10] - 270:9, 270:18, 270:25,	271:2, 288:22, 289:3, 289:8, 289:10, 289:13, 297:9 moonscape [1] - 289:15 morally [2] - 486:22, 487:9 Morey [2] - 261:13, 494:2 MOREY [1] - 256:10 morning [25] - 262:1, 264:10, 264:11, 266:9, 266:10, 283:16, 301:5, 308:13, 316:13, 316:14, 324:3, 324:4, 325:25, 326:1, 329:8, 329:9, 337:15, 344:8, 367:15, 367:16, 371:24, 371:25, 428:13, 436:4, 521:23 Morton [1] - 429:7 most [18] - 269:13, 269:25, 270:3, 286:23, 288:9, 318:14, 342:14, 366:25, 393:12, 403:12, 428:9, 429:16, 443:6, 453:11, 476:10, 506:5, 516:22, 516:23 mostly [1] - 497:17 Motion [8] - 409:16, 413:20, 414:6, 422:5, 422:14, 424:14, 424:18, 425:4 motion [20] - 409:18, 409:20, 410:9, 413:9, 415:9, 416:17, 416:19, 418:1, 418:7, 418:8, 420:16, 420:23, 421:1, 421:15, 421:22, 422:4, 422:22, 422:23, 423:3, 444:2 motivated [1] - 444:9 motivating [2] - 486:5, 489:24 motivations [1] - 457:6 motors [1] - 513:4 mountains [2] - 268:16, 268:25 move [7] - 353:3,	394:21, 424:9, 428:1, 496:25, 498:22, 502:12 moved [3] - 325:1, 493:4, 502:17 Moved [1] - 257:21 movements [1] - 327:16 moves [2] - 488:18, 497:3 moving [8] - 281:11, 394:8, 403:1, 451:25, 471:25, 493:23, 497:3, 519:8 MR [139] - 262:11, 262:16, 262:25, 273:13, 273:16, 275:1, 275:5, 275:19, 277:13, 277:17, 277:20, 283:13, 292:5, 292:10, 292:12, 292:23, 293:2, 293:5, 293:8, 293:11, 294:8, 294:15, 300:18, 300:23, 301:2, 302:18, 302:23, 313:11, 315:3, 321:2, 321:11, 321:15, 321:18, 323:18, 323:22, 325:20, 332:19, 332:25, 333:3, 337:7, 337:11, 337:13, 340:1, 340:7, 340:17, 354:21, 355:16, 367:14, 369:20, 374:18, 375:2, 375:6, 378:12, 378:16, 381:12, 381:15, 387:24, 406:2, 406:9, 406:16, 406:21, 406:25, 407:2, 407:7, 409:2, 409:9, 409:17, 410:13, 413:11, 413:12, 415:5, 416:12, 416:16, 418:18, 420:11, 420:20, 421:7, 421:12, 422:9, 422:14, 422:21, 423:2, 423:8, 423:13, 423:21, 423:24, 428:21, 428:25, 429:18, 430:20, 438:25, 439:5,
---	---	---	---	---

439:8, 440:9, 440:13, 440:14, 441:14, 441:17, 442:1, 442:22, 442:24, 443:9, 443:18, 444:1, 444:7, 444:20, 445:9, 445:15, 445:18, 446:1, 446:3, 446:12, 448:2, 448:4, 448:5, 448:7, 450:22, 451:14, 451:24, 459:1, 459:3, 459:6, 463:1, 468:10, 468:13, 468:18, 468:25, 490:10, 490:12, 493:11, 497:11, 497:14, 508:13, 511:23, 512:1, 513:22, 521:10, 521:12, 521:16 MS [228] - 262:1, 263:1, 274:24, 277:15, 283:14, 283:16, 283:19, 292:7, 292:8, 292:9, 293:1, 293:3, 293:6, 293:9, 294:11, 294:19, 294:21, 294:23, 295:13, 297:12, 297:13, 300:15, 300:19, 300:22, 302:20, 313:13, 313:16, 313:17, 313:18, 313:19, 313:22, 314:25, 315:1, 315:4, 315:7, 316:4, 316:6, 320:21, 320:25, 321:4, 321:8, 321:14, 323:20, 323:24, 324:2, 325:16, 325:19, 325:21, 325:23, 325:24, 332:17, 332:20, 337:9, 340:12, 340:15, 354:18, 355:17, 355:20, 361:23, 361:24, 367:9, 367:11, 369:22, 369:24, 371:19, 371:20, 374:16, 374:19, 374:23, 374:25, 378:14, 378:17, 378:19, 381:14, 381:17, 381:21, 381:22, 381:23,	381:24, 384:4, 387:20, 387:23, 387:25, 388:2, 388:4, 395:17, 395:19, 396:20, 406:1, 406:3, 406:8, 406:14, 407:1, 407:3, 407:11, 409:1, 409:3, 409:7, 409:11, 409:14, 410:11, 413:25, 414:4, 415:3, 415:15, 416:5, 416:18, 417:6, 417:17, 417:22, 418:1, 418:4, 420:9, 420:12, 420:23, 421:15, 421:21, 421:25, 422:2, 422:4, 422:12, 422:17, 423:1, 423:6, 423:10, 423:15, 423:19, 428:23, 429:1, 429:3, 429:22, 430:7, 430:11, 430:15, 430:19, 430:21, 430:24, 431:9, 431:11, 431:17, 431:20, 434:2, 438:23, 439:1, 439:4, 441:15, 441:18, 441:19, 441:21, 441:24, 441:25, 442:2, 442:3, 442:4, 442:7, 442:9, 442:11, 442:21, 443:7, 443:22, 444:6, 445:13, 445:16, 445:20, 446:2, 446:5, 446:8, 450:3, 450:10, 450:17, 450:24, 451:8, 451:15, 451:18, 451:20, 451:22, 451:25, 452:6, 452:9, 458:22, 458:24, 459:2, 463:2, 463:3, 463:6, 468:7, 468:9, 469:3, 489:2, 489:3, 489:5, 490:6, 490:7, 490:11, 490:13, 490:14, 490:16, 493:8, 493:10, 493:12, 493:14, 493:15, 493:19, 493:20, 493:22, 493:25, 494:4, 494:7, 497:6, 497:9,	497:12, 508:15, 508:17, 511:18, 511:21, 513:24, 518:17, 518:19, 518:21, 520:19, 520:25, 521:5, 521:11, 521:13, 521:14, 521:15, 521:17, 521:22 MT-1 [1] - 257:13 multiple [2] - 280:12, 429:11 Murphy [16] - 251:17, 253:4, 253:7, 253:10, 253:18, 253:21, 254:4, 254:6, 254:7, 254:15, 254:18, 262:8, 274:24, 290:15, 295:5, 406:23 MURPHY [41] - 262:11, 262:16, 262:25, 275:1, 275:5, 275:19, 277:13, 292:5, 292:23, 294:8, 300:18, 321:11, 321:15, 321:18, 323:18, 332:19, 332:25, 333:3, 337:7, 340:1, 354:21, 374:18, 406:9, 406:16, 406:21, 406:25, 407:2, 407:7, 409:2, 409:9, 443:9, 444:20, 445:9, 446:1, 446:3, 448:2, 448:5, 459:1, 490:10, 497:11, 521:10 Murphy's [1] - 445:14 must [4] - 273:1, 322:23, 435:21, 514:18 MW [3] - 259:3, 259:8, 259:9 MWs [1] - 259:4 mystery [1] - 313:17	443:1, 452:11, 452:12, 487:5, 494:8, 494:10 names [1] - 293:8 narrow [1] - 418:16 narrower [1] - 414:19 narrowing [1] - 341:9 NARUC [11] - 345:21, 346:6, 351:2, 351:6, 351:7, 351:10, 351:14, 351:18, 507:15, 507:20, 507:22 national [4] - 336:3, 349:2, 399:3, 507:18 nationally [1] - 349:9 Nationwide [1] - 378:7 native [2] - 385:19, 424:11 natural [6] - 306:22, 375:17, 375:19, 376:1, 376:21, 401:7 Natural [1] - 387:3 nature [9] - 269:19, 283:6, 305:6, 308:25, 309:18, 395:4, 403:23, 412:6, 475:23 near [22] - 306:10, 307:19, 323:3, 328:6, 336:16, 384:7, 386:18, 455:15, 456:7, 456:22, 460:10, 460:20, 461:21, 464:13, 465:10, 471:5, 473:7, 473:24, 478:8, 506:4, 506:5, 506:6 nearby [1] - 336:11 Nearby [1] - 258:15 nearest [4] - 293:18, 324:24, 325:3, 384:12 nearly [2] - 415:20, 475:2 necessarily [3] - 305:16, 320:6, 401:20 necessary [6] - 286:3, 389:4, 395:8, 408:22, 449:1, 520:12 need [27] - 264:1, 275:8, 276:8, 294:7, 294:11, 295:1, 330:20, 365:20, 370:1, 374:11, 388:14, 388:16, 391:18, 391:20,	401:17, 404:17, 25 418:2, 422:13, 429:20, 445:22, 445:24, 446:2, 448:13, 489:10, 489:12, 494:24, 520:20 needed [6] - 330:20, 331:11, 377:7, 424:10, 451:19, 481:22 needs [3] - 292:24, 418:6, 430:5 negative [5] - 456:10, 467:11, 471:12, 473:14, 474:18 negatives [1] - 471:21 negligible [1] - 299:9 negotiation [3] - 456:11, 457:13, 481:15 neighbor [12] - 293:12, 293:13, 425:13, 435:20, 449:6, 449:11, 449:12, 449:16, 449:17, 449:20, 449:23, 450:2 neighbor's [3] - 427:3, 479:9, 479:13 neighborhood [1] - 473:7 neighboring [1] - 491:5 neighbors [5] - 292:15, 292:25, 293:7, 293:22, 361:6 Nelson [12] - 371:21, 418:2, 420:14, 420:24, 422:2, 422:21, 431:17, 434:3, 442:5, 450:13, 450:20, 519:15 NELSON [77] - 251:11, 263:4, 263:17, 263:22, 264:8, 297:17, 297:23, 298:6, 298:21, 299:5, 299:11, 299:17, 299:20, 300:3, 300:8, 300:14, 317:22, 329:8, 329:10, 329:17, 330:12, 340:11, 371:22, 407:14, 408:16, 408:25, 415:17, 416:7, 416:13, 416:23, 417:11,
N				
NAD83 [1] - 259:11 Nails [1] - 328:14 name [17] - 293:10, 301:3, 301:5, 301:10, 321:19, 321:21, 333:4, 341:16, 375:7, 423:25, 439:9,				

417:20, 418:3, 418:5, 420:15, 420:22, 421:17, 422:3, 422:25, 431:18, 434:4, 434:13, 434:25, 435:6, 435:9, 435:15, 435:19, 435:21, 435:24, 436:3, 436:9, 436:11, 436:15, 436:18, 436:21, 436:25, 437:3, 437:13, 437:16, 440:16, 442:6, 450:7, 451:1, 451:7, 478:16, 478:19, 478:24, 479:3, 479:11, 479:17, 482:3, 514:5, 514:10, 514:17, 514:24, 515:15, 515:19 Nelson's [1] - 451:13 nest [4] - 377:14, 379:23, 382:22, 394:5 Nest [1] - 257:7 nests [1] - 378:8 net [1] - 283:11 never [23] - 270:8, 270:11, 291:6, 291:7, 300:2, 300:12, 300:13, 305:8, 351:12, 351:14, 386:6, 410:25, 414:15, 433:4, 433:15, 438:3, 438:4, 463:15, 466:4, 490:23, 491:13, 491:14 new [17] - 277:7, 277:10, 290:18, 290:21, 402:2, 402:13, 402:25, 429:6, 429:10, 466:9, 475:5, 475:11, 490:21, 492:2, 493:3, 509:23 newer [1] - 370:25 newspaper [1] - 466:2 next [12] - 276:11, 300:22, 321:8, 321:10, 321:12, 332:22, 362:11, 385:3, 439:4, 493:19, 493:20, 504:19 NextEra [9] - 303:12,	319:17, 319:21, 320:1, 320:7, 334:7, 408:17, 438:8, 495:7 nice [3] - 378:25, 487:11, 487:25 night [6] - 262:6, 267:21, 270:17, 297:10, 313:2, 433:12 night's [1] - 369:6 nine [1] - 460:23 Nine [1] - 328:14 noise [78] - 267:10, 295:10, 299:2, 299:10, 306:23, 306:24, 306:25, 307:1, 307:21, 309:25, 310:3, 310:25, 311:10, 314:13, 317:13, 323:3, 323:11, 324:5, 327:19, 328:6, 328:17, 328:21, 330:22, 330:24, 331:3, 331:8, 332:9, 332:11, 332:13, 332:14, 336:17, 336:24, 356:13, 357:8, 357:14, 357:20, 365:1, 367:19, 367:20, 368:19, 371:5, 371:10, 373:10, 374:9, 385:10, 385:11, 419:6, 434:19, 442:17, 447:7, 462:16, 462:19, 467:5, 467:13, 472:16, 473:2, 473:20, 493:2, 494:21, 495:3, 495:6, 495:8, 498:8, 500:6, 500:14, 500:19, 502:5, 503:5, 503:9, 505:16, 510:3, 510:5, 510:6, 511:10, 512:4, 513:3, 515:8 Noise [9] - 257:18, 258:3, 258:4, 258:6, 258:10, 258:11, 258:12, 259:14, 259:18 none [5] - 263:18, 293:6, 315:3, 325:20, 342:24 nonetheless [1] - 341:20	noninfluenced [1] - 455:24 nonparticipant [3] - 412:24, 413:3, 447:4 nonparticipants [5] - 413:1, 444:17, 496:19, 496:23, 510:21 nonparticipating [8] - 335:2, 368:24, 369:18, 370:16, 444:10, 468:20, 501:18, 507:7 nonparticipants [1] - 512:6 normal [3] - 402:3, 471:17, 512:18 normally [1] - 320:21 north [8] - 293:13, 294:1, 379:2, 428:9, 431:4, 475:13, 475:25, 494:11 North [7] - 341:15, 350:24, 370:3, 370:6, 370:12, 375:11, 400:2 northeast [2] - 384:13, 440:19 northern [3] - 386:23, 386:25, 399:4 Northern [2] - 408:8, 428:2 Northwestern [1] - 322:10 Notary [2] - 522:7, 522:18 note [8] - 265:21, 392:4, 413:22, 432:1, 460:18, 489:17, 499:1, 516:15 noted [4] - 440:11, 440:12, 462:17, 462:20 notes [2] - 265:10, 386:24 nother [1] - 414:23 nothing [19] - 279:10, 300:18, 340:24, 341:2, 357:17, 358:4, 358:8, 358:17, 364:24, 365:18, 428:11, 438:25, 470:16, 475:9, 490:10, 490:12, 493:11, 499:11, 521:12 nothing's [1] - 433:14 Notice [2] - 257:21, 257:22	notice [3] - 278:20, 342:5, 490:5 noticeable [1] - 308:22 noticed [2] - 442:15, 490:1 Novak [1] - 294:4 November [4] - 383:7, 390:7, 467:2, 473:17 novo [1] - 328:4 noxious [1] - 385:18 nuisance [15] - 320:16, 350:7, 355:14, 359:15, 360:18, 360:19, 361:4, 363:12, 368:16, 419:1, 419:9, 419:10, 419:18, 420:18 number [35] - 265:19, 269:24, 276:16, 298:16, 319:10, 330:8, 336:22, 343:9, 348:10, 350:20, 351:1, 357:12, 359:21, 359:25, 360:6, 360:23, 369:9, 372:15, 373:24, 389:15, 399:23, 440:7, 444:14, 466:23, 474:24, 481:7, 483:9, 483:11, 483:18, 488:9, 501:2, 501:10, 503:21, 504:23, 507:11 numbered [2] - 362:5, 385:15 numbers [6] - 263:23, 309:14, 310:19, 328:19, 370:2, 376:8 numerous [9] - 345:4, 357:10, 359:6, 370:11, 377:3, 380:19, 382:17, 470:24, 471:2	446:9, 452:7, 494:5 2 6 object [5] - 381:12, 429:18, 443:9, 450:9, 450:12 objected [1] - 410:16 objection [15] - 292:5, 292:23, 294:8, 340:1, 340:15, 354:21, 381:14, 381:19, 445:12, 445:23, 446:10, 448:2, 450:4, 450:18 objective [4] - 309:23, 327:12, 327:13, 327:17 Objective [2] - 258:4, 258:9 obligated [2] - 486:22, 487:9 obligation [1] - 275:19 observance [1] - 341:21 observation [1] - 386:25 observe [2] - 411:10, 501:18 observed [1] - 462:23 observer [1] - 271:25 obtain [1] - 475:21 obtained [1] - 453:1 obvious [1] - 464:7 obviously [8] - 331:11, 437:6, 467:21, 472:24, 477:13, 480:14, 481:10, 481:23 occasion [3] - 447:1, 447:8, 448:16 occasions [3] - 359:6, 447:5, 447:16 occupant [1] - 377:16 occupational [1] - 322:11 occupied [4] - 259:10, 284:17, 291:9, 378:8 occur [9] - 271:4, 349:16, 390:11, 390:16, 391:7, 391:9, 407:20, 465:6, 506:8 occurred [10] - 270:8, 292:3, 326:18, 348:10, 460:14, 460:23, 463:20, 464:2, 488:6, 491:19 occurrence [2] - 363:15, 499:20 occurrences [1] - 392:8 occurring [2] -
O				
O&M [1] - 408:23 o'clock [2] - 320:22, 374:23 O-L-L-S-O-N [1] - 333:7 oath [12] - 262:10, 300:25, 321:16, 333:1, 369:16, 375:4, 407:12, 423:22, 439:6,				

279:21, 382:11 occurs [2] - 278:22, 339:19 ocean [2] - 306:8, 307:18 October [4] - 376:7, 500:2, 507:13, 508:5 OF [6] - 251:2, 251:4, 251:5, 522:1, 522:3 offensive [1] - 411:16 offer [18] - 293:16, 323:19, 337:8, 409:24, 424:25, 428:22, 441:14, 449:12, 449:13, 450:1, 456:18, 456:21, 476:16, 481:18, 486:15, 486:21, 487:7, 494:23 offered [3] - 410:18, 410:19, 433:2 offering [3] - 411:19, 418:19, 422:16 offers [1] - 476:9 offhand [1] - 347:11 Office [1] - 377:6 office [1] - 375:11 often [6] - 307:17, 312:24, 313:5, 466:11, 466:18, 476:7 oftentimes [1] - 475:20 old [3] - 277:10, 410:25, 459:9 older [1] - 491:9 Olson [18] - 257:23, 260:6, 306:4, 321:12, 332:25, 333:6, 333:8, 337:8, 337:14, 340:18, 346:2, 354:24, 355:21, 362:1, 367:15, 374:19 OLLSON [1] - 254:17 OLSON [1] - 256:7 Olson [1] - 261:14 omnidirectional [1] - 277:25 on-and-off [2] - 515:13, 520:4 once [5] - 391:5, 400:16, 419:11, 472:4, 501:5 one [152] - 265:15, 268:4, 268:12, 269:16, 270:14, 274:1, 274:9, 275:6, 277:21, 280:1,	280:12, 280:14, 288:7, 289:19, 291:21, 292:13, 294:1, 294:5, 294:6, 294:15, 295:8, 298:10, 298:13, 298:18, 304:25, 308:9, 309:15, 316:25, 319:15, 319:22, 325:10, 329:20, 338:20, 338:21, 339:15, 340:12, 340:22, 346:4, 346:20, 347:25, 348:18, 349:12, 352:12, 356:9, 362:16, 363:21, 364:11, 366:11, 367:2, 372:22, 378:8, 379:24, 382:21, 383:17, 384:11, 387:13, 389:10, 391:13, 392:24, 393:4, 393:7, 393:16, 393:24, 394:2, 398:14, 398:19, 399:4, 399:21, 401:15, 402:17, 402:23, 403:4, 405:8, 412:2, 412:17, 414:9, 417:2, 423:15, 430:25, 431:4, 431:16, 433:11, 435:7, 435:8, 436:1, 440:5, 440:19, 442:13, 442:15, 442:24, 444:22, 445:7, 449:13, 449:25, 450:3, 450:8, 450:14, 454:3, 456:9, 457:22, 459:21, 460:12, 464:9, 464:25, 465:4, 465:8, 466:8, 468:22, 469:10, 472:4, 473:15, 473:16, 474:7, 474:18, 475:8, 475:13, 475:25, 476:20, 476:25, 477:18, 481:5, 481:24, 483:14, 485:24, 486:8, 487:19, 487:20, 488:10, 492:24, 493:7, 493:21, 497:25, 498:9, 498:16, 499:25,	503:6, 507:25, 514:10, 514:20, 514:21, 516:13, 517:7, 520:12 one's [1] - 306:18 one-by-one [3] - 338:20, 338:21, 339:15 one-minute [1] - 362:16 one-off [1] - 372:22 onerous [1] - 419:8 ones [4] - 379:5, 461:11, 478:7, 514:22 Onida [2] - 251:25, 522:13 oops [1] - 446:13 open [7] - 270:16, 278:6, 343:1, 480:19, 480:20, 498:11 openhandedly [1] - 408:24 opening [3] - 264:20, 330:19, 380:9 operate [3] - 315:17, 407:25, 408:11 operating [6] - 330:6, 388:25, 408:17, 419:2, 520:7 operation [9] - 354:2, 388:24, 419:17, 419:22, 456:5, 456:8, 461:1, 491:9, 491:11 operational [3] - 310:7, 310:14, 310:20 operations [8] - 327:5, 388:21, 394:11, 395:7, 404:18, 405:3, 408:6, 408:22 opinion [28] - 279:2, 279:17, 288:11, 346:17, 347:12, 347:14, 347:18, 352:19, 357:24, 360:21, 362:21, 386:13, 395:11, 409:25, 410:22, 411:6, 416:21, 448:23, 458:3, 460:6, 479:16, 480:14, 480:22, 483:16, 489:6, 489:13, 492:7, 514:25 opinions [2] - 411:20, 472:15	opportunity [7] - 417:13, 433:2, 443:11, 476:15, 477:2, 477:3, 496:19 opposed [3] - 280:12, 344:19, 501:1 Optical [1] - 258:22 optimal [1] - 512:8 optimization [1] - 510:20 option [2] - 498:11, 502:24 options [3] - 498:17, 502:10, 502:11 OR [1] - 429:9 oral [1] - 477:20 Ord [2] - 260:3, 260:4 order [12] - 262:2, 339:25, 375:1, 401:24, 402:10, 407:19, 408:19, 409:15, 443:22, 444:11, 444:13, 501:17 ordered [1] - 447:18 ordinance [11] - 276:13, 276:24, 277:8, 290:3, 290:18, 290:21, 290:24, 333:14, 341:14, 347:6, 357:16 ordinances [1] - 359:3 organizations [1] - 319:20 origin [1] - 347:20 Original [1] - 257:20 original [5] - 277:3, 352:15, 364:2, 416:19, 490:20 originally [3] - 442:15, 444:17, 517:13 originating [1] - 348:14 origins [2] - 341:5, 346:23 OSHA [3] - 512:23, 512:24, 512:25 otherwise [2] - 414:10, 420:13 otter [2] - 386:24, 387:1 otters [2] - 386:17, 386:19 ought [1] - 300:10 outcome [1] - 320:2 outdoor [1] - 279:4 outlined [2] - 310:8, 423:2 output [1] - 498:12	outreach [1] - 449:1 outset [1] - 413:17 outside [16] - 284:15, 297:20, 340:4, 341:21, 342:6, 342:7, 342:25, 343:4, 343:15, 361:8, 367:24, 385:1, 392:5, 400:21, 480:21, 515:5 overall [1] - 372:23 overarch [1] - 370:13 overarching [3] - 364:5, 370:17, 373:11 overbroad [1] - 412:25 overestimating [1] - 518:9 overrule [1] - 443:17 overview [9] - 301:18, 302:9, 322:3, 322:20, 333:18, 334:16, 357:18, 375:21, 376:17 overwhelming [1] - 306:13 own [5] - 354:7, 404:24, 423:4, 461:18, 496:13 owned [2] - 462:10, 469:19 owner [3] - 333:7, 419:8, 465:15 owner's [2] - 434:23, 434:24 owners [7] - 411:9, 418:25, 419:21, 419:24, 420:5, 493:3, 499:19 ownership [2] - 411:23, 466:11 Oxford [1] - 374:14
P				
P-O-H-L [1] - 362:24 p.m [1] - 521:24 PAGE [6] - 253:2, 254:2, 255:2, 255:9, 255:19, 256:2 page [56] - 264:14, 264:15, 264:16, 266:11, 273:7, 273:11, 273:21, 296:10, 296:12, 303:6, 306:5, 318:8, 340:21, 340:23, 346:22, 347:8, 349:11, 349:14,				

351:25, 352:4, 352:6, 352:16, 352:21, 362:4, 362:5, 364:10, 364:23, 370:2, 376:8, 385:14, 385:15, 386:24, 388:7, 389:13, 389:15, 389:21, 390:13, 390:18, 412:19, 415:23, 416:8, 416:13, 416:25, 418:10, 418:11, 425:5, 425:11, 439:16, 442:14, 470:6, 470:15, 482:5, 497:19, 499:1, 499:5 Pages [1] - 251:9 pages [2] - 340:20, 508:11 paginated [1] - 340:20 paid [5] - 320:3, 432:6, 432:9, 432:10, 474:10 Paige [1] - 261:14 PAIGE [1] - 256:7 paired [1] - 456:1 paper [9] - 263:24, 336:4, 346:2, 356:16, 359:23, 363:21, 363:25, 371:9 papers [3] - 334:20, 335:8, 361:15 parade [1] - 436:9 paragraph [5] - 273:24, 352:7, 352:20, 352:22, 362:11 paragraphs [2] - 349:20, 362:6 parallel [1] - 294:2 parameter [1] - 332:15 Parameters [1] - 258:6 parameters [3] - 318:18, 318:20, 318:22 paraphrase [2] - 499:5, 499:9 Parcel [1] - 259:9 parcels [1] - 411:8 Park [1] - 501:8 park [1] - 501:24 Parker [1] - 419:15 parking [1] - 504:16 Parks [5] - 377:5, 380:15, 387:5, 393:11, 394:13 parlance [2] - 341:9,	344:18 parse [1] - 515:10 Part [1] - 261:9 part [36] - 267:16, 280:25, 319:23, 326:20, 334:1, 337:14, 339:22, 342:14, 344:23, 349:25, 352:15, 352:18, 363:3, 366:25, 367:17, 371:4, 371:8, 381:13, 391:15, 394:13, 394:16, 415:10, 416:3, 426:2, 426:3, 431:23, 459:13, 459:21, 460:11, 464:16, 464:18, 500:13, 501:14, 509:4, 510:5 partial [1] - 414:6 participant [2] - 434:18, 451:2 participant's [1] - 451:3 participants [7] - 326:12, 458:4, 462:10, 471:15, 472:10, 477:10, 477:14 Participants [1] - 258:13 participate [1] - 448:20 participated [3] - 333:16, 375:16, 508:24 participating [1] - 335:3 participation [13] - 444:8, 444:16, 446:20, 446:24, 447:3, 447:17, 447:23, 448:11, 448:15, 448:19, 449:15, 449:18, 449:20 particular [14] - 304:14, 307:11, 308:1, 317:6, 325:10, 328:5, 329:24, 357:17, 410:21, 457:23, 461:22, 470:16, 481:12, 507:4 particularly [1] - 461:2 particulate [1] - 356:12 parts [2] - 402:3,	425:5 party [2] - 417:18, 493:6 Party [1] - 260:17 pass [3] - 266:6, 302:19, 508:14 passage [2] - 345:13, 352:2 passed [1] - 422:22 passes [2] - 420:16, 422:4 passing [8] - 343:16, 343:19, 344:11, 344:15, 345:1, 345:5, 345:9, 366:24 past [8] - 291:4, 354:10, 370:15, 400:23, 404:1, 430:2, 482:9, 517:7 path [5] - 398:5, 398:11, 398:17, 399:16, 401:11 paths [2] - 398:12, 400:20 paved [1] - 384:25 pay [1] - 432:25 paying [1] - 427:20 payments [1] - 451:5 pays [1] - 476:10 peaked [1] - 270:14 peer [7] - 303:13, 319:23, 320:4, 334:20, 336:2, 359:23, 363:21 peer-reviewed [5] - 319:23, 334:20, 336:2, 359:23, 363:21 pegged [1] - 440:5 pelicans [1] - 381:8 pending [1] - 386:9 pension [1] - 362:17 people [45] - 269:20, 278:16, 294:7, 294:14, 297:8, 300:1, 300:4, 323:2, 323:12, 323:14, 326:14, 328:3, 329:16, 331:7, 335:21, 336:13, 347:24, 350:20, 355:13, 358:1, 368:14, 369:6, 371:12, 372:2, 372:21, 373:25, 420:4, 443:23, 448:20, 448:21, 468:23, 471:25, 472:11, 472:15, 472:18, 473:4,	473:14, 476:8, 476:12, 476:14, 481:24, 482:24, 483:11, 493:1, 493:22 per [12] - 274:3, 274:7, 347:12, 349:20, 349:22, 353:4, 353:19, 354:25, 359:10, 360:14, 367:4, 382:13 perceived [2] - 341:10, 411:11 percent [22] - 272:8, 308:15, 360:6, 391:24, 392:7, 399:18, 467:10, 470:23, 473:15, 473:21, 475:2, 475:8, 476:24, 501:4, 505:7, 505:8, 513:7, 516:11, 516:14, 517:5, 517:14 percentage [2] - 289:3, 308:14 percentagewise [1] - 308:24 perceptibility [1] - 308:21 perceptible [3] - 308:19, 309:3, 309:7 perception [3] - 287:18, 308:18, 461:5 perfectly [3] - 270:17, 366:15, 411:5 perform [4] - 272:17, 314:2, 314:12, 314:18 performed [5] - 281:14, 381:11, 460:6, 460:7, 466:17 perhaps [12] - 267:23, 308:7, 309:4, 311:8, 324:10, 324:23, 347:19, 366:9, 416:17, 461:23, 502:12, 520:12 period [12] - 312:22, 312:23, 313:6, 328:22, 331:8, 362:13, 372:22, 397:22, 398:3, 463:24, 471:24, 493:4 periods [3] - 316:1, 383:9, 401:5 peripheral [1] - 505:6 PERMIT [1] - 251:5	permit [8] - 262:4, 28 291:21, 292:2, 292:4, 412:22, 419:3, 421:13, 492:20 Permit [5] - 261:16, 290:7, 292:1, 378:7, 419:3 permits [4] - 291:17, 291:19, 292:2, 482:9 Permits [1] - 257:9 permitted [6] - 412:7, 415:25, 443:3, 456:7, 461:4, 472:24 permitting [3] - 375:24, 376:1, 488:19 perpetuated [1] - 348:21 person [8] - 275:18, 320:2, 406:15, 426:21, 445:3, 451:5, 475:21, 476:9 person's [1] - 323:9 personal [3] - 268:10, 288:8, 412:9 personally [4] - 311:14, 318:1, 375:16, 387:7 personnel [2] - 388:21, 388:23 persons [1] - 411:5 perspective [4] - 317:7, 317:10, 317:12, 335:24 pertain [1] - 412:10 pertaining [1] - 357:8 pertinent [1] - 475:4 perturbed [1] - 432:21 pessimistic [1] - 467:4 Ph.D [3] - 333:21, 356:5, 361:9 PhD [1] - 335:23 phenomena [1] - 343:16 phenomenon [6] - 328:3, 341:23, 342:25, 345:9, 476:11, 506:12 Philadelphia [1] - 322:9 Philippine [1] - 413:24 philosophical [1] - 434:5 philosophy [1] - 356:3 phone [2] - 468:24, 516:7 phonetic [1] - 330:2 photo [1] - 475:21
---	---	---	---	--

photographer [1] - 272:9	414:16, 414:17, 486:6	positions [2] - 398:11, 403:10	practical [3] - 285:25, 497:5, 502:15	427:2 29
photography [1] - 272:5	plays [1] - 335:7	positive [1] - 470:17	practice [6] - 267:17, 286:1, 286:4, 300:12, 321:22	prepared [8] - 290:19, 305:25, 312:11, 410:14, 423:19, 424:23, 432:25, 439:16
photoelectric [1] - 330:2	pleading [1] - 420:6	positively [1] - 498:21	practices [6] - 351:2, 351:8, 351:14, 378:9, 500:9, 507:15	preparing [2] - 333:17, 342:3
Photosensitive [2] - 258:17, 258:18	plotted [1] - 312:8	possession [2] - 411:23, 426:4	Practices [3] - 345:21, 345:25, 346:6	presence [1] - 306:13
phrase [3] - 417:1, 417:12, 432:16	plumbed [1] - 305:8	possibility [3] - 498:12, 498:16, 502:15	prairie [1] - 487:20	present [7] - 281:2, 281:6, 304:19, 345:15, 443:20, 452:3, 497:16
physical [3] - 283:5, 283:10, 434:13	plus [6] - 288:1, 298:19, 319:3, 319:6, 347:9, 503:20	possible [12] - 279:24, 280:14, 285:15, 287:12, 297:24, 299:23, 305:22, 346:1, 353:6, 362:20, 500:22, 510:11	prairies [1] - 268:17	presentation [3] - 326:2, 346:9, 374:15
physician [2] - 321:21, 327:21	PMR [1] - 424:9	possibly [5] - 285:21, 324:8, 367:3, 379:20, 384:23	preceding [1] - 353:3	presented [1] - 487:1
physicians [2] - 361:14, 361:16	Pohl [3] - 362:24, 363:3, 363:5	post [2] - 326:5, 424:10	precipitating [1] - 330:2	presenting [2] - 398:20, 476:9
physics [2] - 283:3, 517:2	point [29] - 270:14, 271:9, 271:23, 272:2, 272:19, 277:3, 329:12, 330:8, 340:10, 353:10, 364:17, 377:13, 382:4, 382:17, 383:1, 389:11, 389:12, 425:11, 425:21, 430:25, 440:15, 447:1, 450:17, 465:3, 474:25, 477:18, 505:7, 506:7, 507:5	Postal [1] - 424:7	precise [1] - 266:20	Preservation [1] - 377:6
physics-based [1] - 283:3	policy [1] - 408:18	Postconstruction [1] - 257:17	Precision [1] - 251:25	president [2] - 494:16, 494:17
pick [3] - 275:1, 295:13, 444:13	Polysomnographic [1] - 258:6	postconstruction [3] - 301:17, 302:13, 309:20	precluded [1] - 414:12	pressure [2] - 309:1
picking [1] - 294:24	pondering [1] - 434:4	potential [19] - 259:4, 322:1, 323:9, 327:4, 331:4, 335:4, 338:7, 339:4, 357:24, 359:15, 376:21, 391:11, 392:2, 398:4, 470:25, 471:2, 476:13, 477:7	preconstruction [1] - 314:3	presumption [2] - 470:7, 470:11
picture [4] - 263:14, 289:5, 289:6, 299:13	pool [3] - 477:9, 484:11, 484:16	potentially [11] - 308:6, 360:7, 365:23, 369:3, 392:20, 394:10, 398:14, 401:10, 401:15, 402:6, 421:12	predict [2] - 338:10, 517:23	pretend [1] - 271:15
piece [1] - 311:8	poor [2] - 352:19, 362:12	pounds [1] - 357:25	predicted [4] - 308:10, 339:12, 503:7, 507:7	pretty [11] - 264:22, 266:15, 318:12, 343:24, 379:15, 405:8, 410:5, 418:16, 439:23, 464:7, 473:22
pierce [1] - 393:4	population [9] - 305:23, 361:19, 373:23, 379:21, 381:8, 458:3, 467:17, 477:3	powder [2] - 268:15, 268:25	predicting [2] - 339:6, 339:8	Prevailing [3] - 487:20, 501:8, 502:16
Pierre [2] - 252:4, 426:24	porch [1] - 325:13	power [7] - 272:11, 319:8, 494:20, 509:19, 509:21, 513:1, 513:18	prediction [2] - 269:13, 503:18	prevailing [1] - 501:24
piggyback [1] - 436:4	portion [12] - 265:22, 292:1, 305:23, 331:25, 335:19, 372:6, 373:23, 374:2, 416:3, 416:18, 418:15, 450:18	Power [2] - 408:8, 428:2	predicts [1] - 338:18	prevalent [1] - 350:18
pinpoint [2] - 266:22, 267:2	portions [3] - 410:8, 414:25, 471:9	PowerPoint [5] - 346:5, 346:7, 346:9, 346:11, 346:16	predominate [1] - 312:14	prevent [1] - 420:17
pipeline [1] - 373:19	pose [4] - 446:16, 449:24, 454:12, 495:17	Poweshiek [2] - 257:6, 377:15	preface [1] - 291:17	previous [4] - 443:17, 453:16, 478:1, 510:4
Pizza [1] - 425:20	posed [4] - 446:16, 449:24, 454:12, 495:17	practicable [1] - 378:6	prefer [6] - 306:2, 328:16, 332:14, 362:7, 407:7, 472:4	previously [3] - 447:4, 453:15, 460:22
place [7] - 335:23, 378:10, 380:4, 399:11, 426:8, 505:14, 505:15	posing [1] - 335:4		preference [2] - 304:5, 481:9	price [17] - 455:23, 456:3, 456:25, 457:8, 457:15, 467:6, 467:15, 470:8, 471:18, 473:9, 474:1, 474:14, 476:7, 477:4, 483:3, 489:25, 491:3
placed [1] - 404:20	position [5] - 344:25, 389:5, 407:22, 479:18, 520:10		preferences [3] - 386:3, 386:9, 386:11	prices [1] - 455:15
placement [1] - 379:1			preferred [1] - 509:13	primaries [1] - 276:1
placing [2] - 330:14, 426:13			prefile [1] - 322:13	Primary [1] - 260:5
plainly [1] - 268:13			Prefiled [13] - 261:12, 261:12, 261:13, 261:14, 261:14, 261:15, 302:1, 302:3, 334:8, 334:10, 376:6, 376:8, 376:11	primary [3] - 302:12, 312:24, 452:19
plains [1] - 268:21			prefiled [11] - 302:7, 302:9, 322:18, 334:16, 376:15, 409:21, 410:10, 452:2, 453:24, 454:12, 495:18	print [1] - 272:6
Plan [2] - 257:11, 376:25			premium [3] - 482:23, 483:2, 483:3	pro [3] - 251:20, 251:22, 294:10
plan [6] - 266:2, 394:16, 395:1, 403:21, 449:13, 498:3			preparation [5] - 326:21, 389:25, 400:9, 455:11, 495:1	probabilities [2] -
planned [1] - 506:25			prepare [2] - 390:1,	
planning [3] - 321:9, 333:13, 357:11				
plans [3] - 393:22, 432:25, 497:24				
plant [1] - 373:24				
plants [4] - 373:20, 494:20, 513:1				
plastic [1] - 315:21				
play [6] - 295:22, 298:16, 330:4,				

354:2 probability [1] - 354:13 probing [1] - 340:7 problem [4] - 279:20, 330:10, 331:6, 431:8 problems [2] - 327:23, 414:23 procedural [1] - 443:22 Procedure [3] - 414:8, 414:11, 414:16 proceed [2] - 313:20, 422:11 proceeding [1] - 340:3 proceedings [5] - 252:1, 443:14, 481:1, 522:9, 522:12 Proceedings [1] - 251:7 process [20] - 296:5, 310:13, 388:22, 393:22, 419:12, 431:22, 433:22, 445:5, 448:25, 449:2, 456:11, 457:13, 462:13, 463:16, 470:4, 477:8, 479:25, 480:19, 485:12, 496:13 produce [1] - 340:6 produced [2] - 277:7, 335:9 Produced [1] - 258:11 produces [1] - 353:25 product [1] - 502:2 production [2] - 379:16, 449:5 profession [5] - 361:15, 453:1, 453:11, 460:4, 480:5 Professional [2] - 522:6, 522:19 professional [2] - 452:14, 514:24 professionally [1] - 499:22 professionals [1] - 279:18 professorships [1] - 333:25 proffer [1] - 340:2 profile [1] - 288:13 program [1] - 310:16 Project [1] - 334:6 project [142] - 265:23, 270:4, 272:20, 274:13, 280:9, 284:4, 284:7,	284:15, 284:21, 285:6, 286:1, 286:2, 293:19, 296:20, 297:20, 301:14, 310:6, 311:12, 314:18, 314:21, 322:2, 322:25, 333:16, 334:5, 334:22, 334:23, 335:4, 335:9, 335:15, 335:16, 337:5, 338:8, 338:15, 344:7, 356:16, 357:15, 357:17, 357:20, 359:3, 365:2, 365:8, 365:11, 365:13, 365:16, 365:19, 365:23, 366:2, 366:3, 366:4, 366:8, 368:20, 368:21, 369:7, 372:20, 373:8, 373:9, 373:18, 373:21, 373:25, 374:1, 375:13, 375:16, 376:22, 377:11, 377:13, 379:3, 379:19, 380:1, 380:3, 380:4, 380:12, 380:20, 382:1, 382:3, 382:5, 382:19, 383:12, 386:18, 387:2, 387:7, 387:10, 390:12, 390:16, 391:7, 391:9, 391:12, 391:24, 392:5, 392:11, 392:12, 393:17, 397:10, 397:11, 397:13, 398:2, 403:18, 405:10, 407:23, 408:15, 408:18, 413:3, 426:10, 428:2, 440:10, 447:21, 448:21, 448:22, 449:13, 450:2, 451:4, 455:16, 456:7, 456:17, 458:11, 461:4, 472:24, 484:24, 485:2, 488:12, 488:13, 496:16, 497:20, 497:21, 498:1, 498:10, 502:20, 509:1, 509:7, 509:14, 510:3, 511:11, 512:13, 513:19,	515:7, 515:9, 515:11, 520:2, 520:7, 520:14 project's [1] - 379:1 projected [1] - 265:20 projects [27] - 285:23, 296:21, 301:23, 320:15, 320:19, 334:7, 336:23, 368:1, 370:12, 371:15, 373:19, 375:25, 453:12, 453:13, 455:14, 472:8, 481:25, 488:6, 500:18, 501:3, 502:14, 503:14, 509:15, 512:22, 517:7, 517:22, 520:11 prolonged [1] - 328:22 promise [1] - 450:8 prompt [1] - 450:21 prompted [1] - 509:4 prompts [1] - 451:9 propagation [1] - 503:25 propensity [1] - 329:23 proper [2] - 310:5, 333:15 properly [4] - 267:24, 334:23, 358:6, 487:1 properties [22] - 455:21, 455:24, 461:21, 463:10, 463:11, 463:12, 464:24, 465:1, 466:18, 466:19, 470:9, 472:7, 472:22, 474:3, 474:22, 476:25, 477:15, 478:5, 478:11, 491:7, 492:22, 492:25 property [112] - 355:9, 355:10, 358:15, 364:6, 377:23, 411:8, 411:11, 411:23, 412:11, 412:24, 413:2, 418:22, 418:25, 419:8, 419:21, 419:24, 420:5, 426:13, 427:7, 428:8, 428:15, 428:17, 428:19, 429:4, 429:5, 434:11, 434:13, 434:23, 434:24,	435:2, 435:4, 435:12, 436:19, 451:3, 452:15, 452:17, 455:23, 456:18, 456:23, 457:9, 458:12, 459:9, 459:20, 460:6, 460:16, 461:5, 461:14, 461:16, 461:25, 462:5, 462:7, 462:11, 462:15, 462:16, 462:24, 463:12, 464:17, 464:25, 465:15, 465:22, 465:25, 466:1, 466:2, 466:4, 467:5, 467:9, 467:10, 467:14, 467:16, 467:25, 470:13, 470:20, 471:4, 471:7, 471:11, 471:22, 472:19, 474:19, 475:15, 475:19, 476:7, 476:10, 476:13, 476:15, 476:19, 479:4, 479:7, 479:9, 479:13, 480:8, 480:22, 480:24, 481:2, 481:3, 481:23, 483:10, 489:7, 489:11, 489:13, 489:15, 489:22, 489:23, 490:3, 490:4, 490:21, 490:24, 490:25, 493:4, 499:18 Property [2] - 257:10, 259:22 proposal [11] - 260:7, 260:8, 260:9, 265:11, 274:17, 275:8, 275:14, 275:16, 275:22, 275:23, 498:20 propose [1] - 447:2 proposed [15] - 275:25, 303:4, 306:11, 322:25, 334:22, 365:11, 388:6, 388:13, 391:8, 394:23, 395:11, 404:8, 496:7, 514:11 Proposed [2] - 257:17, 261:16 proposes [1] - 395:3	protect [2] - 400:13, 304:5 protected [2] - 294:7, 378:3 protecting [1] - 403:5 protection [4] - 349:2, 355:13, 369:10, 404:7 protective [2] - 369:9, 369:18 Protocol [1] - 257:18 protocol [10] - 301:17, 302:13, 302:15, 302:16, 303:5, 309:20, 315:9, 514:22, 519:15, 519:25 proven [1] - 283:8 provide [16] - 281:12, 301:15, 301:18, 302:9, 322:3, 322:20, 333:18, 334:16, 375:21, 376:17, 388:5, 391:25, 479:15, 480:16, 489:13, 501:17 provided [11] - 275:12, 319:9, 346:22, 391:10, 393:20, 410:22, 418:7, 457:18, 458:21, 467:3, 470:16 provides [1] - 295:5 providing [1] - 381:15 proximity [21] - 347:23, 455:15, 455:25, 456:4, 456:19, 456:21, 458:1, 458:10, 460:10, 460:15, 463:21, 468:1, 470:9, 470:11, 470:17, 471:4, 477:11, 477:16, 480:1, 481:3, 506:25 prying [1] - 485:14 PSC [1] - 341:15 Psychological [1] - 258:8 public [4] - 383:12, 383:16, 384:17, 384:18 PUBLIC [2] - 251:1, 251:10 Public [8] - 257:22, 322:12, 396:4, 396:10, 500:3, 500:8, 522:7, 522:18
---	--	---	--	--

Publication ^[1] - 257:22 publications ^[2] - 326:16, 334:3 published ^[12] - 303:13, 314:7, 318:3, 320:4, 326:23, 327:10, 334:3, 334:20, 336:3, 359:23, 361:15, 363:2 PUC ^[11] - 257:22, 290:5, 290:19, 370:14, 370:15, 412:12, 422:23, 444:11, 447:6, 447:18, 455:12 pull ^[4] - 273:5, 361:21, 370:24, 417:12 pulled ^[1] - 417:1 pulling ^[2] - 360:8, 417:15 pulse ^[1] - 505:23 purchased ^[3] - 429:4, 467:9, 476:4 purely ^[1] - 502:1 purpose ^[4] - 298:23, 302:12, 305:1, 429:24 purposes ^[7] - 281:9, 281:11, 281:21, 295:16, 321:9, 495:25, 520:3 pursuant ^[1] - 296:1 pursue ^[1] - 421:11 purview ^[1] - 356:25 push ^[2] - 313:6, 318:14 put ^[33] - 269:4, 271:16, 271:18, 275:23, 290:17, 298:12, 312:12, 314:9, 315:22, 318:11, 326:3, 346:9, 354:6, 363:6, 378:10, 379:20, 396:7, 404:12, 407:9, 408:23, 415:12, 423:15, 429:6, 429:7, 467:5, 470:1, 480:7, 486:23, 498:1, 507:24, 512:4, 512:5, 516:2 puts ^[1] - 434:17 putting ^[5] - 299:20, 300:4, 478:12, 479:18, 498:16	Q qualify ^[1] - 285:8 Quality ^[1] - 258:13 quality ^[2] - 314:17, 314:18 quantified ^[1] - 340:10 quantify ^[1] - 462:7 quarters ^[1] - 293:14 Queens ^[1] - 333:20 queried ^[1] - 270:7 query ^[1] - 464:12 questioning ^[4] - 269:1, 297:1, 297:2, 298:23 questions ^[93] - 262:13, 262:17, 263:2, 263:3, 264:9, 274:21, 283:21, 294:17, 295:20, 297:12, 297:16, 299:12, 302:18, 306:2, 313:24, 316:5, 316:7, 317:16, 323:22, 325:17, 325:23, 330:18, 343:5, 358:25, 368:9, 371:19, 371:22, 371:23, 378:16, 387:21, 387:24, 389:8, 395:17, 395:20, 395:23, 396:25, 400:17, 408:7, 415:16, 417:21, 417:23, 418:13, 429:21, 430:12, 430:20, 431:9, 431:18, 432:1, 434:6, 441:24, 442:1, 442:3, 442:6, 442:8, 442:10, 443:4, 443:6, 454:11, 458:23, 459:3, 459:18, 463:4, 468:7, 468:10, 469:4, 469:7, 469:9, 472:4, 478:20, 478:22, 479:1, 482:12, 482:13, 482:16, 484:23, 485:3, 487:5, 488:21, 490:6, 490:8, 495:17, 497:7, 497:18, 509:12, 511:18, 514:2, 516:10, 518:18, 520:19, 521:8, 521:10,	521:14, 521:16 Questions ^[18] - 253:6, 253:12, 253:16, 253:20, 254:6, 254:13, 254:16, 254:20, 255:5, 255:7, 255:12, 255:15, 255:17, 255:22, 256:6, 256:9, 256:11, 256:16 queues ^[1] - 337:1 quick ^[2] - 330:18, 432:2 quicker ^[1] - 494:1 quickly ^[5] - 316:11, 345:6, 457:1, 471:22, 493:24 quiet ^[2] - 266:14, 470:12 quite ^[2] - 345:5, 513:11 quote ^[4] - 410:15, 497:20, 497:21, 499:2 quotes ^[1] - 349:25 quoting ^[1] - 411:20	285:10, 286:15, 290:6, 290:11, 334:5, 492:10 ranking ^[1] - 373:3 Raptor ^[1] - 257:7 raptor ^[3] - 377:14, 382:22, 394:5 rare ^[6] - 363:16, 404:5, 405:11, 502:14, 502:19, 513:10 rate ^[4] - 344:4, 344:5, 470:22, 475:12 re ^[9] - 385:20, 385:21, 385:23, 385:25, 386:2, 386:4, 386:6, 386:8, 429:6 re-insulated ^[1] - 429:6 re-vegetate ^[4] - 385:20, 385:25, 386:4, 386:8 re-vegetated ^[1] - 386:6 re-vegetating ^[2] - 385:21, 385:23 re-vegetation ^[1] - 386:2 reached ^[1] - 304:11 reaction ^[2] - 328:23, 363:8 reactions ^[2] - 362:17, 362:20 read ^[26] - 264:13, 273:22, 295:24, 349:25, 352:13, 353:5, 357:22, 362:6, 362:8, 362:12, 364:14, 385:17, 399:10, 404:23, 417:7, 434:18, 439:24, 442:14, 465:20, 465:21, 468:14, 479:5, 508:9, 509:22, 519:19 reading ^[10] - 298:18, 313:3, 345:14, 431:13, 471:8, 484:23, 484:25, 510:4, 515:22, 520:17 readings ^[5] - 312:9, 312:14, 312:16, 313:8, 314:20 reads ^[1] - 331:25 real ^[20] - 270:8, 285:3, 316:11, 320:15, 353:14, 408:17, 411:8,	411:23, 412:22, 452:15, 452:17, 452:20, 453:1, 453:5, 453:9, 463:9, 480:5, 502:24, 503:12, 510:9 Real ^[2] - 480:9, 480:12 Realistic ^[2] - 259:9, 259:10 realities ^[1] - 264:1 reality ^[1] - 264:7 realize ^[3] - 283:21, 330:13, 433:19 really ^[49] - 263:5, 263:11, 266:19, 266:24, 282:17, 282:18, 286:5, 288:24, 293:16, 300:6, 328:18, 332:9, 351:12, 356:20, 380:3, 380:11, 391:16, 393:3, 394:2, 395:7, 396:4, 396:5, 401:17, 412:1, 415:12, 420:10, 430:11, 433:21, 441:19, 447:10, 459:8, 468:11, 469:16, 473:16, 474:3, 480:19, 482:13, 486:13, 487:11, 487:22, 487:23, 502:21, 505:12, 507:2, 512:9, 513:3, 514:6, 515:22, 515:23 realm ^[1] - 444:25 Realtime ^[2] - 522:6, 522:19 reargue ^[1] - 444:2 reason ^[14] - 287:11, 289:5, 291:9, 328:5, 340:19, 359:19, 363:19, 366:18, 368:22, 395:8, 407:5, 476:2, 479:24, 515:4 reasonable ^[10] - 343:9, 350:7, 350:21, 359:14, 360:21, 361:5, 369:5, 468:2, 481:18, 500:19 reasonably ^[1] - 502:23 reasons ^[1] - 362:17 reassess ^[1] - 417:13 rebuttal ^[3] - 364:19,

407:4, 407:9 Rebuttal [17] - 260:6, 260:6, 260:10, 260:10, 260:11, 260:11, 260:12, 274:14, 302:3, 302:14, 334:10, 364:10, 376:11, 385:14, 388:5, 393:19, 495:6 recalling [1] - 445:12 receipt [1] - 505:19 receive [7] - 278:10, 280:11, 402:4, 403:9, 441:2, 470:4, 486:15 received [8] - 291:25, 343:17, 372:12, 376:3, 449:4, 453:6, 486:21, 487:6 receiver [2] - 506:5, 506:6 receiving [5] - 278:7, 279:25, 280:4, 355:9, 373:8 recent [6] - 336:2, 363:2, 393:12, 467:2, 492:2, 514:14 recently [4] - 324:21, 325:1, 465:2, 466:23 receptor [29] - 263:10, 264:2, 265:5, 265:7, 265:12, 271:13, 274:2, 274:19, 277:22, 278:12, 279:25, 281:18, 282:24, 284:12, 284:21, 295:8, 298:25, 299:1, 308:11, 337:19, 337:21, 337:24, 338:3, 338:4, 339:15, 505:19, 505:24 Receptor [2] - 259:8, 259:10 receptor-by-receptor [1] - 281:18 receptors [12] - 265:6, 272:18, 284:23, 285:17, 286:2, 288:16, 288:19, 290:4, 292:13, 297:19, 318:16, 355:8 recess [7] - 262:6, 320:24, 374:24, 409:13, 446:7, 521:22, 521:24 recognize [3] -	453:22, 454:18, 496:2 recognizing [1] - 366:24 recollection [1] - 332:4 recommend [1] - 520:23 recommendation [5] - 351:19, 359:11, 359:17, 511:2, 519:12 recommendations [5] - 359:8, 359:9, 377:9, 400:5, 503:1 recommended [2] - 351:18, 501:16 record [39] - 273:23, 275:20, 275:24, 275:25, 276:14, 276:20, 277:6, 278:13, 281:3, 301:4, 301:9, 316:9, 321:20, 331:24, 333:5, 336:8, 336:9, 352:15, 367:2, 374:22, 375:8, 406:7, 409:10, 423:8, 424:1, 439:9, 445:5, 445:6, 446:20, 452:11, 462:3, 480:11, 494:3, 494:9, 495:25, 514:4, 521:3, 521:4, 521:21 recorded [1] - 465:7 records [3] - 377:20, 491:22, 491:23 recross [4] - 443:4, 490:7, 518:17, 521:7 RECROSS [5] - 277:19, 283:18, 292:11, 294:22, 490:15 Recross [7] - 253:7, 253:8, 254:7, 254:8, 254:9, 255:23 RECROSS-EXAMINATION [5] - 277:19, 283:18, 292:11, 294:22, 490:15 Recross-Examination [7] - 253:7, 253:8, 254:7, 254:8, 254:8, 254:9, 255:23 redacted [1] - 422:10 redesign [1] - 498:20 redirect [24] - 274:25,	275:2, 276:11, 277:13, 292:6, 300:17, 320:22, 321:1, 321:2, 332:18, 374:17, 406:1, 406:2, 409:1, 443:13, 451:13, 489:2, 490:8, 492:24, 493:13, 518:18, 521:5, 521:6, 521:8 Redirect [6] - 253:7, 253:21, 254:7, 255:23, 256:6, 256:12 REDIRECT [3] - 275:4, 489:4, 518:20 reduce [4] - 359:15, 374:8, 498:10, 510:6 reduced [2] - 423:3, 511:5 reduces [3] - 360:24, 424:18, 510:20 reducing [1] - 355:14 refer [4] - 338:13, 345:8, 370:3, 397:15 reference [3] - 353:7, 353:17, 378:25 referenced [4] - 336:4, 346:2, 353:18, 361:13 references [1] - 460:20 referencing [2] - 341:7, 345:12 referred [4] - 326:9, 368:8, 456:1, 456:13 referring [20] - 269:16, 297:3, 326:8, 346:8, 348:2, 362:23, 363:9, 365:21, 370:9, 378:22, 384:19, 384:20, 386:5, 399:17, 412:20, 459:23, 459:24, 476:19, 477:22, 507:23 reflect [2] - 268:19, 278:10 reflected [1] - 282:25 reflecting [2] - 282:16, 506:6 reflection [3] - 278:14, 282:9, 282:19 reflective [6] - 278:8, 281:23, 282:5, 282:7, 288:12, 505:2 refresh [2] - 390:3, 509:18 refrigerator [2] -	267:3, 307:16 refrigerators [3] - 306:7, 306:20, 308:3 refuge [1] - 399:3 regard [2] - 338:2, 511:9 regarding [11] - 257:19, 257:20, 259:21, 259:23, 283:22, 314:13, 327:22, 386:17, 388:7, 393:21, 393:23 regards [2] - 455:13, 489:11 region [3] - 303:23, 304:1, 308:4 Register [1] - 465:8 Registered [2] - 522:5, 522:19 regular [1] - 394:11 regulate [1] - 343:13 regulated [1] - 341:18 regulation [6] - 341:19, 346:17, 348:16, 349:5, 349:7, 350:16 regulations [4] - 342:24, 343:22, 345:2, 376:23 regulatory [5] - 500:19, 502:18, 507:19, 519:12, 521:1 REISS [5] - 388:2, 388:4, 395:17, 442:3, 451:20 Reiss [10] - 251:23, 253:6, 253:8, 253:11, 253:20, 255:5, 256:8, 256:11, 256:12, 256:14 relate [3] - 411:22, 411:24, 425:15 related [5] - 301:15, 322:2, 327:10, 453:13, 512:25 Related [1] - 259:15 relates [3] - 318:18, 418:22, 434:25 relating [1] - 411:12 relation [5] - 272:12, 283:24, 329:10, 467:17, 514:11 relationship [3] - 271:24, 317:24, 484:15 relative [2] - 296:20, 517:17	relatively [1] - 496:22 32 released [1] - 326:23 relevant [9] - 305:16, 452:21, 453:7, 480:8, 480:18, 480:23, 481:6, 481:22, 495:6 reliable [2] - 315:16, 410:23 relied [2] - 414:13, 507:20 rely [3] - 414:10, 414:15, 414:24 remain [3] - 381:9, 392:22, 503:2 remains [1] - 498:3 remember [13] - 272:5, 287:19, 311:8, 438:2, 459:11, 465:11, 467:20, 467:24, 474:2, 487:19, 491:16, 501:10, 507:24 remind [3] - 262:10, 429:22, 478:22 remnants [4] - 285:10, 285:12, 285:13, 285:14 remodel [1] - 476:3 remodeled [1] - 475:11 remodeling [1] - 475:16 remote [2] - 496:22, 497:1 remove [3] - 416:2, 416:6, 477:9 removed [1] - 418:16 repair [1] - 429:9 repeat [3] - 404:10, 412:8, 446:18 repeated [1] - 373:14 rephrase [2] - 381:23, 394:19 rephrases [1] - 340:13 report [15] - 290:9, 290:14, 311:19, 323:12, 327:13, 342:16, 346:23, 363:20, 368:3, 500:13, 507:15, 507:22, 507:23, 508:4 Report [13] - 257:5, 257:5, 257:6, 257:7, 257:7, 257:8, 257:8, 257:9, 259:6, 259:7, 345:21, 345:25, 346:6
---	---	--	---	--

reported [6] - 312:15, 335:10, 368:25, 470:24, 471:2, 473:19 Reported [4] - 251:24, 258:4, 258:7, 258:9 Reporter [5] - 331:25, 522:6, 522:19, 522:19 reporter [11] - 300:25, 321:16, 333:1, 369:16, 375:4, 423:9, 423:22, 439:6, 452:7, 494:5, 522:9 reporter's [1] - 338:25 Reporting [1] - 251:25 reporting [2] - 281:9, 361:20 reports [6] - 323:2, 326:23, 335:17, 345:24, 357:12, 365:15 represent [1] - 497:15 request [3] - 346:21, 354:6, 449:5 requested [3] - 310:12, 314:4, 417:6 requests [1] - 406:20 Requests [2] - 449:25, 450:1 required [5] - 310:13, 383:19, 479:12, 502:11, 514:16 requirements [4] - 370:7, 401:23, 402:8, 447:22 requires [2] - 362:22, 370:7 rescue [1] - 361:25 research [23] - 303:7, 303:8, 303:14, 305:10, 319:19, 323:8, 334:2, 342:12, 343:8, 455:12, 455:17, 457:19, 460:8, 463:7, 463:16, 464:18, 466:17, 466:22, 466:25, 477:13, 477:22, 478:1, 490:2 researched [2] - 305:9, 474:13 researcher [2] - 319:25, 335:23 researching [2] - 479:20, 483:9 residence [6] - 306:10, 462:20,	471:5, 474:14, 477:11, 505:20 residences [4] - 323:17, 332:5, 477:24, 501:18 resident [1] - 371:6 residential [13] - 453:11, 455:15, 458:1, 459:19, 461:21, 463:12, 464:3, 465:1, 470:8, 478:5, 478:10, 481:1, 507:1 residents [8] - 335:2, 335:3, 335:5, 336:12, 336:16, 337:6, 342:15, 499:19 Residents [2] - 258:15, 336:7 resistance [1] - 403:11 resistivity [3] - 504:11, 504:14, 504:17 resold [1] - 467:9 resolution [1] - 289:23 resolve [1] - 262:13 resolved [1] - 413:16 resource [1] - 377:19 Resources [3] - 257:5, 259:24, 303:12 resources [11] - 375:20, 376:2, 376:21, 377:1, 377:2, 377:21, 378:4, 378:5, 378:11, 387:18, 405:15 respect [4] - 273:25, 282:15, 305:21, 448:23 respective [1] - 411:8 respectively [1] - 376:5 respond [3] - 315:17, 498:19, 498:21 responded [1] - 449:6 respondents [1] - 371:6 responding [1] - 434:10 response [19] - 262:17, 281:22, 311:3, 311:5, 324:5, 347:7, 354:6, 389:7, 410:12, 414:2, 415:4, 415:11, 443:8, 445:14, 448:18, 449:10,	449:22, 449:23, 450:21 Response [1] - 260:12 responses [1] - 449:25 Responses [5] - 260:23, 261:3, 261:4, 261:5, 261:9 responsibilities [3] - 452:18, 452:19, 494:18 responsible [1] - 375:14 rest [5] - 293:6, 406:9, 406:25, 415:25, 417:3 restating [1] - 397:5 rested [1] - 409:7 resubmit [1] - 422:12 Result [1] - 259:9 result [7] - 283:11, 295:23, 327:2, 328:12, 361:1, 444:3, 486:25 resulted [1] - 345:25 resulting [1] - 361:2 results [9] - 259:10, 260:9, 274:16, 276:23, 277:5, 309:17, 311:21, 340:5, 488:17 Results [3] - 259:8, 259:10, 259:11 resume [1] - 314:16 Resume [4] - 257:13, 257:14, 257:15, 257:17 retain [2] - 356:21, 357:7 retained [2] - 358:15, 494:23 retired [1] - 459:12 retort [1] - 514:9 revelation [1] - 263:23 Revenues [1] - 257:16 review [9] - 321:25, 322:21, 351:7, 379:18, 380:3, 389:25, 394:22, 502:5 Review [1] - 258:16 reviewed [9] - 303:13, 319:23, 320:4, 334:20, 336:2, 359:23, 363:21, 494:25, 495:3 revision [1] - 507:17 revisions [1] - 495:4 revolves [1] - 263:5 Rich [1] - 257:16	RICH [1] - 254:10 Richard [5] - 257:17, 260:10, 300:24, 301:5, 301:10 Richter [16] - 456:14, 457:23, 464:25, 465:6, 479:4, 479:12, 479:23, 481:10, 482:13, 484:24, 485:2, 485:21, 485:24, 489:7, 489:15, 489:21 Richters [1] - 487:3 RIDGE [1] - 251:4 Ridge [132] - 251:17, 257:3, 262:4, 262:7, 262:22, 275:14, 276:15, 277:11, 281:19, 283:25, 284:5, 285:7, 291:11, 291:20, 291:21, 291:22, 291:23, 291:24, 291:25, 292:1, 292:3, 293:19, 296:22, 297:4, 297:6, 300:17, 300:23, 301:13, 302:16, 314:2, 314:12, 314:17, 314:21, 320:25, 321:24, 322:23, 323:15, 325:3, 332:17, 332:22, 333:10, 333:11, 333:12, 334:6, 334:22, 335:20, 336:1, 337:4, 356:21, 357:7, 357:15, 359:12, 359:21, 374:16, 375:2, 375:12, 375:15, 376:19, 377:3, 377:8, 379:19, 383:17, 385:18, 386:18, 388:16, 389:3, 391:11, 391:13, 391:23, 393:7, 393:21, 393:22, 395:1, 395:5, 395:13, 396:12, 396:14, 396:17, 397:24, 400:10, 402:20, 403:1, 403:10, 404:15, 405:12, 405:18, 405:19, 406:8, 406:11, 407:9,	408:17, 412:17, 413:5, 413:6, 418:15, 420:12, 422:24, 425:12, 426:10, 428:24, 433:6, 438:6, 438:8, 440:7, 440:8, 441:16, 443:7, 444:9, 446:10, 447:1, 447:16, 456:17, 458:25, 460:21, 460:24, 472:23, 483:20, 484:7, 490:9, 492:8, 492:9, 496:11, 497:10, 510:2, 510:11, 517:7, 520:1, 520:2, 520:13, 521:9 Ridge's [3] - 375:1, 395:14, 502:2 right-of-way [1] - 453:12 rights [9] - 364:6, 411:24, 412:3, 412:9, 418:25, 419:1, 419:24, 428:18, 432:10 Riina_Bray_IWT_ Niagara [1] - 260:23 ring [2] - 324:22, 388:10 ringing [2] - 327:25, 328:13 rising [2] - 339:3, 339:4 risk [12] - 328:10, 329:24, 329:25, 335:4, 337:6, 356:10, 357:23, 357:25, 358:11, 365:23, 365:25, 366:16 Rislov [1] - 251:14 river [4] - 386:17, 386:19, 386:23, 386:25 RL-1 [1] - 257:17 RL-2 [1] - 257:17 RL-3 [1] - 257:18 RL2 [2] - 303:3, 303:4 RL3 [3] - 302:24, 303:6, 316:18 RM-S-1 [1] - 259:14 RM-S-2 [1] - 259:14 RM-S-3 [1] - 259:15 RM-S-4 [1] - 259:15 RM-S-5 [1] - 259:17 RM-S-6 [1] - 259:18 RM-S-7 [1] - 259:19
---	---	--	---	--

RMS-2 ^[1] - 326:10 road ^[15] - 270:1, 270:5, 344:10, 344:14, 344:24, 363:11, 366:9, 366:11, 366:12, 379:14, 383:12, 383:22, 384:25, 481:16, 492:4 roads ^[2] - 383:16, 384:18 roadway ^[6] - 344:9, 345:10, 366:13, 366:16, 384:22, 385:5 roadways ^[2] - 366:7, 366:22 Robert ^[2] - 259:13, 321:21 ROBERT ^[1] - 254:14 Robish ^[26] - 251:21, 253:5, 253:15, 253:19, 254:8, 254:19, 256:5, 256:15, 292:9, 292:10, 294:24, 295:14, 315:2, 325:19, 367:12, 367:16, 387:23, 414:1, 430:19, 441:25, 452:1, 468:9, 493:10, 511:22, 511:23, 521:15 ROBISH ^[23] - 292:10, 292:12, 293:2, 293:5, 293:8, 293:11, 294:15, 315:3, 325:20, 367:14, 369:20, 387:24, 430:20, 442:1, 468:10, 468:13, 468:18, 468:25, 493:11, 511:23, 512:1, 513:22, 521:16 Robish's ^[1] - 297:2 role ^[10] - 301:13, 301:15, 321:24, 333:10, 333:11, 335:7, 335:22, 361:10, 375:12, 502:1 roof ^[2] - 429:10, 475:5 room ^[7] - 278:22, 278:23, 278:24, 289:16, 343:25, 443:21, 475:5 rotating ^[1] - 345:1	rotor ^[1] - 516:19 rough ^[1] - 295:9 roughly ^[2] - 308:21, 506:16 royal ^[1] - 333:23 RPR ^[1] - 251:24 RR ^[1] - 453:3 rule ^[1] - 370:19 ruler ^[6] - 271:15, 271:16, 271:18, 271:19, 271:22, 285:2 rules ^[2] - 287:19, 443:15 Rules ^[5] - 409:24, 410:6, 414:8, 414:11, 414:16 ruling ^[1] - 443:17 run ^[3] - 373:19, 420:24, 494:14 running ^[2] - 294:2, 460:25 runs ^[1] - 379:14 rural ^[27] - 266:14, 267:10, 287:17, 306:10, 311:1, 371:15, 457:25, 460:9, 463:12, 464:3, 465:1, 466:17, 466:18, 467:25, 470:8, 470:13, 473:25, 474:14, 477:11, 477:24, 478:4, 478:10, 481:1, 482:23, 484:1, 484:12, 517:22 rustling ^[1] - 312:25	sale ^[43] - 428:19, 455:5, 455:20, 456:10, 456:14, 456:15, 456:17, 456:24, 456:25, 457:1, 457:7, 457:15, 457:23, 458:1, 458:2, 458:6, 462:24, 463:10, 463:15, 464:14, 465:8, 465:10, 466:25, 467:8, 474:6, 478:10, 479:23, 481:13, 483:13, 483:14, 483:19, 485:21, 485:24, 486:2, 486:8, 486:11, 486:24, 489:21, 491:2, 491:16, 491:23 sales ^[55] - 454:3, 454:9, 455:17, 455:18, 455:22, 456:1, 456:2, 456:6, 456:9, 457:19, 457:24, 460:9, 460:14, 460:20, 460:22, 460:23, 461:3, 462:17, 463:10, 463:17, 463:20, 463:24, 464:2, 464:3, 464:10, 464:13, 465:6, 466:5, 466:22, 467:1, 470:20, 471:17, 471:21, 473:6, 473:12, 474:13, 474:20, 474:23, 477:15, 478:3, 478:8, 478:10, 479:20, 481:5, 483:9, 485:22, 486:7, 488:5, 488:7, 488:13, 491:18 samples ^[2] - 336:12, 336:18 SAPPINGTON ^[1] - 255:3 Sappington ^[7] - 257:12, 259:20, 260:11, 321:13, 375:3, 375:9, 406:3 SARAH ^[1] - 255:3 Sarah ^[6] - 257:12, 259:20, 260:11, 321:13, 375:3, 375:9 satisfy ^[1] - 370:18 saw ^[2] - 486:4,	496:19 scale ^[5] - 285:2, 287:25, 298:5, 372:16, 373:10 scatter ^[1] - 503:15 scenario ^[1] - 277:4 scenery ^[1] - 470:13 schedule ^[1] - 408:23 School ^[1] - 322:12 school ^[5] - 267:19, 270:15, 297:9, 459:9, 484:16 schools ^[1] - 484:11 SCHUMACHER ^[17] - 300:23, 301:2, 302:18, 321:2, 375:2, 375:6, 378:12, 381:12, 381:15, 406:2, 409:17, 413:11, 415:5, 428:25, 429:18, 440:13, 441:17 Schumacher ^[7] - 251:17, 253:14, 254:11, 255:4, 411:18, 414:21, 415:4 Science ^[1] - 301:25 science ^[7] - 301:25, 322:6, 333:20, 356:4, 356:6, 357:1, 360:1 sciences ^[2] - 333:22, 356:6 scientific ^[10] - 288:21, 334:3, 334:19, 334:20, 335:8, 335:24, 337:2, 357:19, 368:6, 368:23 scientist ^[2] - 333:8, 359:9 scope ^[9] - 292:6, 340:4, 361:8, 383:3, 385:1, 395:12, 433:18, 443:13, 478:4 Scores ^[1] - 258:9 screens ^[1] - 315:16 SD ^[2] - 259:21, 259:23 se ^[3] - 251:20, 251:22, 294:10 sea ^[2] - 413:24, 437:11 search ^[1] - 377:20 searches ^[3] - 326:22, 395:24, 464:12 seasonal ^[1] - 491:9	second ^[9] - 296:16, 34 340:20, 352:12, 364:11, 371:8, 372:9, 385:15, 412:4, 412:15 Second ^[2] - 261:5, 261:5 section ^[1] - 386:20 Section ^[2] - 386:23, 390:14 sectional ^[3] - 326:4, 326:7, 326:10 see ^[81] - 263:23, 270:20, 270:21, 270:24, 271:1, 271:2, 273:15, 278:17, 284:14, 287:12, 289:14, 297:11, 316:11, 317:15, 320:18, 325:12, 326:22, 331:1, 331:22, 335:13, 338:9, 342:18, 343:6, 348:25, 349:17, 353:10, 360:22, 361:2, 364:17, 366:25, 367:25, 368:25, 372:23, 372:24, 373:1, 373:4, 374:9, 379:4, 379:11, 382:15, 392:6, 392:10, 393:1, 393:3, 393:13, 402:16, 408:8, 410:3, 411:14, 423:5, 423:11, 423:16, 428:16, 430:15, 432:16, 436:15, 463:18, 464:17, 471:20, 472:4, 472:5, 472:8, 472:14, 472:21, 473:3, 475:23, 479:8, 483:5, 484:13, 485:8, 487:16, 491:23, 495:9, 502:6, 502:14, 505:20, 506:10, 507:11, 516:7 seed ^[2] - 385:19, 386:8 seeing ^[12] - 342:8, 344:4, 344:21, 368:6, 368:15, 369:4, 373:5, 402:24, 450:5, 473:5, 488:17,
--	--	--	--	---

515:23 seem [5] - 350:7, 397:18, 427:18, 467:14, 496:17 seemingly [1] - 403:11 seizure [1] - 329:23 Seizures [2] - 258:19, 259:19 seizures [1] - 330:2 selected [1] - 326:12 selective [2] - 437:22, 437:23 Self [3] - 258:4, 258:7, 258:9 self [2] - 424:6 self-employed [2] - 424:6 Self-Reported [3] - 258:4, 258:7, 258:9 sell [10] - 428:2, 458:11, 463:19, 464:18, 467:14, 471:22, 474:3, 474:22, 476:7, 492:23 seller [17] - 456:19, 457:10, 457:14, 458:9, 462:11, 462:22, 467:3, 470:16, 470:24, 471:2, 471:16, 473:19, 475:15, 476:18, 481:4, 493:7 seller's [1] - 467:11 sellers [1] - 457:9 selling [13] - 455:15, 455:23, 456:3, 456:25, 457:8, 466:3, 467:15, 470:8, 471:18, 473:6, 473:9, 477:15, 489:25 senior [1] - 333:7 sense [5] - 315:16, 411:3, 412:1, 496:17, 497:25 sensible [1] - 520:17 sensitive [9] - 370:8, 370:9, 370:13, 370:21, 376:21, 380:16, 458:4, 468:19, 481:24 sensitivity [1] - 266:12 sensor [3] - 264:5, 286:19, 286:24 sentence [15] - 352:20, 352:25, 353:3, 353:16, 362:11, 364:14, 386:7, 416:1, 416:9,	416:14, 417:3, 417:10, 418:10, 418:12, 499:11 sentences [1] - 412:17 separate [1] - 311:6 separately [1] - 335:6 September [7] - 264:14, 273:6, 273:11, 322:14, 334:9, 347:3, 376:9 series [4] - 310:14, 336:2, 368:9, 371:9 serious [2] - 405:10, 405:13 seriously [1] - 468:21 service [1] - 357:7 Service [11] - 377:5, 380:14, 389:22, 390:6, 390:11, 391:6, 393:11, 393:13, 402:22, 424:7, 500:3 services [2] - 356:21, 452:19 session [1] - 446:8 set [9] - 281:15, 302:17, 307:2, 320:8, 329:17, 341:15, 409:12, 414:23, 478:6 Set [4] - 261:3, 261:5, 261:6, 261:9 setback [2] - 383:18, 384:1 setbacks [1] - 472:25 setting [6] - 287:17, 315:18, 328:4, 339:3, 339:9, 510:23 settings [4] - 328:8, 330:10, 332:8, 517:22 seven [4] - 456:5, 461:3, 478:7, 509:2 several [4] - 347:15, 379:22, 444:21, 476:9 shaded [1] - 263:19 shading [4] - 353:6, 353:15, 362:13, 362:18 Shadow [5] - 257:9, 258:20, 259:7, 259:9, 260:8 shadow [163] - 259:10, 263:6, 263:11, 263:14, 264:6, 264:14, 265:13, 265:19, 270:21, 270:23, 270:24, 271:2, 271:6, 271:8,	272:3, 272:14, 273:25, 278:2, 278:7, 278:10, 278:13, 278:15, 278:18, 278:20, 278:22, 278:23, 278:25, 279:2, 279:3, 279:7, 279:12, 279:14, 279:20, 279:23, 280:1, 280:2, 280:11, 281:12, 289:24, 299:14, 299:15, 299:18, 299:21, 299:23, 300:5, 323:15, 329:10, 329:11, 329:15, 329:22, 330:1, 330:7, 330:11, 334:25, 336:20, 337:3, 337:20, 337:22, 338:1, 338:8, 338:13, 338:16, 339:2, 339:10, 339:16, 339:17, 340:8, 340:9, 340:22, 341:5, 341:8, 341:9, 341:13, 341:16, 341:17, 341:19, 341:21, 341:24, 342:4, 342:9, 342:11, 342:20, 342:24, 343:3, 343:7, 343:10, 343:14, 343:15, 343:21, 344:11, 344:14, 344:15, 344:19, 344:21, 345:1, 345:5, 345:9, 345:11, 346:8, 346:16, 346:23, 347:5, 347:20, 348:1, 348:4, 348:12, 348:15, 350:6, 350:7, 350:11, 350:25, 351:19, 353:7, 353:14, 354:4, 354:7, 354:11, 354:25, 355:9, 356:13, 359:13, 359:14, 359:23, 360:23, 361:1, 362:16, 363:23, 365:1, 366:24, 366:25, 367:24, 368:1, 368:8, 368:12, 368:13, 368:16, 370:16,	372:18, 385:7, 428:5, 428:6, 428:7, 434:20, 441:2, 444:14, 447:7, 448:9, 462:8, 462:16, 462:19, 467:4, 467:13, 472:16, 473:3, 501:23, 501:25 shadow's [3] - 338:10, 338:19, 339:11 shadowing [1] - 343:4 shadows [6] - 343:6, 344:9, 366:7, 366:13, 384:22, 385:5 shall [1] - 340:22 shared [6] - 490:2, 490:17, 491:4, 491:11, 491:13, 492:3 sharp [1] - 263:3 shed [1] - 429:7 sheer [1] - 503:11 sheet [1] - 504:25 sheriff [1] - 433:15 shift [3] - 392:19, 392:22, 393:6 shine [3] - 354:14, 354:18, 355:22 shining [1] - 354:14 ship [1] - 413:23 Shirley [9] - 260:21, 365:4, 365:5, 508:20, 509:1, 509:7, 512:13, 518:22, 519:9 shooting [1] - 436:12 short [14] - 301:18, 302:9, 309:12, 320:24, 322:3, 322:20, 333:18, 334:16, 375:21, 376:17, 409:13, 432:3, 446:7, 471:24 shorten [2] - 447:12, 448:18 shorthand [3] - 432:2, 522:9 show [19] - 277:11, 280:20, 294:13, 294:15, 312:9, 317:20, 335:8, 365:18, 412:5, 456:2, 456:10, 458:2, 458:3, 464:2, 473:8, 485:23, 495:24 showed [2] - 276:4, 471:3	showing [3] - 388:22, 388:48, 486:7, 486:8 shown [4] - 306:23, 323:8, 323:11, 369:8 shows [7] - 263:10, 280:22, 280:23, 318:11, 470:20, 474:21, 485:25 shut [4] - 407:19, 408:19, 419:19, 433:7 shutdowns [1] - 310:15 sic [4] - 425:19, 452:18, 453:2, 453:3 sick [1] - 361:18 side [4] - 366:11, 428:11, 474:18 siding [1] - 429:10 sight [2] - 289:12, 372:3 sign [1] - 486:22 signature [1] - 305:15 significant [7] - 374:5, 418:15, 470:24, 475:14, 475:17, 476:3, 516:22 significantly [2] - 373:14, 502:23 signs [1] - 451:2 silver [1] - 494:11 similar [25] - 316:19, 317:17, 326:18, 336:17, 348:10, 350:9, 351:11, 353:25, 354:5, 354:9, 355:3, 357:12, 358:25, 361:12, 368:10, 370:14, 371:14, 371:17, 395:2, 395:4, 396:8, 443:15, 498:14, 514:16, 514:17 similarities [1] - 317:19 Simko [2] - 419:14, 419:18 simple [2] - 515:4, 517:2 simplify [1] - 350:15 simply [11] - 303:11, 340:7, 344:15, 345:5, 361:4, 411:14, 414:20, 420:20, 500:10, 517:1, 520:20 single [6] - 298:24, 299:2, 399:16, 399:21, 446:15
--	--	---	---	--

singular ^[1] - 398:11 Sioux ^[7] - 419:14, 452:13, 471:23, 483:5, 483:6, 483:7, 484:14 sit ^[2] - 351:21, 487:15 site ^[9] - 376:20, 387:8, 455:20, 462:14, 463:22, 470:11, 472:22, 489:11, 497:24 site-specific ^[1] - 376:20 sited ^[6] - 334:23, 366:9, 380:22, 383:12, 384:7, 512:8 sites ^[2] - 496:21, 502:25 siting ^[9] - 333:15, 377:25, 378:2, 378:7, 380:20, 384:16, 384:24, 385:3, 447:22 sitting ^[1] - 503:13 situated ^[2] - 344:24, 429:13 situation ^[3] - 267:6, 447:20, 513:13 situations ^[2] - 408:12, 470:2 six ^[9] - 284:7, 284:9, 334:3, 382:8, 461:3, 463:24, 478:7, 496:21, 509:2 sixth ^[1] - 470:23 sizable ^[1] - 467:18 size ^[2] - 325:14, 378:25 Skipper ^[1] - 257:6 skipper ^[1] - 377:15 Skipper-Poweshiek ^[1] - 257:6 skipperling ^[1] - 377:15 Skipperling ^[1] - 257:7 sky ^[1] - 344:1 sleep ^[19] - 267:14, 267:20, 317:24, 324:13, 324:16, 327:1, 327:5, 327:12, 327:16, 327:20, 331:15, 331:21, 368:20, 369:1, 369:2, 369:7, 374:6 Sleep ^[3] - 258:5, 258:6, 258:7 sleet ^[1] - 505:1 slightly ^[4] - 336:19,	412:13, 412:25, 414:19 sling ^[1] - 384:22 slowly ^[1] - 362:12 small ^[11] - 335:19, 336:22, 372:6, 373:11, 399:5, 431:5, 435:9, 435:11, 516:23, 517:19, 518:8 smaller ^[2] - 365:11, 473:25 snow ^[28] - 267:24, 268:3, 268:8, 268:12, 268:15, 268:16, 268:18, 268:20, 268:25, 281:23, 281:24, 282:6, 288:4, 288:5, 288:9, 314:23, 504:3, 504:9, 504:10, 504:14, 504:17, 504:18, 504:21, 504:25, 505:3, 518:12 so-called ^[2] - 337:18, 449:6 soccer ^[1] - 270:16 Society's ^[2] - 259:21, 259:23 software ^[1] - 272:16 soil ^[1] - 402:9 sold ^[17] - 407:24, 456:6, 456:23, 460:10, 465:2, 466:4, 467:6, 470:20, 472:12, 473:17, 473:22, 474:1, 474:7, 476:4, 477:25, 489:14, 492:25 solid ^[1] - 282:12 solidly ^[1] - 482:5 soliloquy ^[1] - 421:3 someone ^[10] - 307:6, 307:10, 329:23, 368:3, 432:21, 447:3, 467:18, 476:16, 481:16, 515:16 sometime ^[1] - 491:17 sometimes ^[8] - 328:4, 373:23, 432:3, 432:4, 472:11, 473:3, 491:6, 516:6 somewhat ^[4] - 308:14, 316:21, 317:18, 398:21 somewhere ^[7] -	309:12, 311:3, 348:19, 413:23, 419:7, 462:4, 501:4 sorry ^[31] - 296:11, 296:23, 301:10, 339:20, 352:4, 352:8, 352:12, 353:3, 364:11, 364:20, 364:22, 394:19, 394:21, 399:9, 404:23, 408:8, 420:11, 424:15, 427:11, 431:3, 434:3, 437:15, 437:24, 438:2, 445:18, 460:1, 469:7, 476:20, 494:2 sort ^[12] - 268:7, 307:7, 309:3, 312:9, 317:2, 349:5, 416:21, 443:7, 494:21, 500:24, 502:6, 513:9 Sorted ^[2] - 259:8, 259:10 sorts ^[3] - 395:24, 488:4, 504:19 sought ^[2] - 409:19, 425:16 Sound ^[9] - 257:8, 257:18, 258:7, 259:6, 259:8, 259:9, 259:16, 260:7 sound ^[126] - 266:14, 267:2, 267:24, 268:2, 268:4, 268:8, 282:15, 282:21, 282:23, 285:14, 286:24, 287:18, 288:5, 288:6, 288:12, 288:13, 288:17, 289:20, 290:6, 290:18, 291:3, 292:17, 292:21, 295:3, 297:24, 298:2, 298:3, 298:10, 298:12, 298:13, 298:15, 301:15, 301:17, 302:13, 303:4, 303:21, 303:25, 304:6, 304:13, 305:15, 306:7, 306:14, 306:16, 307:24, 308:1, 309:1, 309:5, 309:10, 309:13, 309:14, 309:15, 309:16, 309:18,	309:20, 309:24, 310:5, 310:21, 311:25, 312:22, 312:25, 313:6, 313:7, 314:3, 316:23, 317:3, 317:24, 318:16, 318:22, 318:24, 319:8, 319:9, 322:22, 323:15, 327:22, 335:1, 335:9, 335:18, 337:2, 351:16, 364:25, 369:5, 372:5, 372:7, 372:16, 448:9, 461:22, 461:23, 461:25, 462:1, 462:2, 462:5, 493:2, 496:18, 498:13, 499:3, 499:17, 500:10, 502:9, 503:8, 503:12, 503:16, 503:25, 504:12, 505:6, 505:11, 505:23, 506:6, 506:20, 510:7, 511:4, 512:22, 512:25, 513:16, 513:20, 514:25, 515:5, 515:9, 516:19, 519:15, 519:25, 520:3, 520:6 sound-related ^[1] - 301:15 sounded ^[1] - 421:10 sounds ^[3] - 309:18, 438:5, 469:15 source ^[9] - 282:24, 307:21, 307:25, 309:15, 309:16, 463:21, 505:24, 506:4, 506:9 sources ^[6] - 288:7, 306:25, 309:14, 309:18, 312:7, 313:7 Sources ^[2] - 258:12, 259:17 South ^[45] - 251:25, 252:4, 268:21, 311:11, 316:15, 334:4, 348:10, 349:7, 354:16, 366:20, 371:14, 371:15, 377:5, 380:15, 387:3, 387:5, 393:11, 394:13, 396:23, 397:14, 400:22,	402:24, 419:16, 424:4, 428:10, 452:16, 453:10, 455:18, 456:16, 457:20, 458:4, 458:8, 459:9, 468:23, 484:10, 485:22, 486:17, 487:11, 488:20, 492:19, 501:13, 501:14, 515:21, 522:7, 522:13 south ^[4] - 391:22, 441:5, 456:16, 501:14 SOUTH ^[2] - 251:2, 522:1 southeast ^[1] - 387:2 southwest ^[1] - 440:7 space ^[1] - 338:14 spaced ^[2] - 312:20, 366:11 spacing ^[1] - 287:7 speaking ^[5] - 268:18, 324:11, 412:23, 413:1, 463:11 special ^[1] - 413:13 specialize ^[1] - 494:19 Species ^[1] - 390:14 species ^[16] - 378:10, 380:16, 382:14, 390:15, 390:16, 391:8, 392:6, 400:1, 401:2, 401:6, 401:9, 403:6, 404:5, 404:22, 405:11, 405:13 specific ^[16] - 308:7, 323:5, 364:17, 376:20, 391:18, 391:20, 396:13, 401:17, 401:23, 460:6, 461:8, 461:13, 464:15, 478:3, 498:20, 505:1 specifically ^[19] - 316:25, 327:4, 329:18, 334:4, 334:24, 357:16, 382:7, 382:10, 387:17, 388:19, 390:6, 400:10, 402:8, 472:23, 480:6, 488:14, 496:18, 504:10, 520:3 specifics ^[1] - 475:18 specified ^[1] - 409:20 spectrum ^[4] - 266:17, 505:10, 506:11,
---	--	--	--	--

513:12 speculate [1] - 449:19 speed [3] - 264:25, 366:23, 503:15 spell [2] - 423:25, 439:9 spelled [2] - 333:6, 362:15 spent [1] - 453:12 spikes [1] - 503:5 spinning [1] - 343:17 split [1] - 274:13 sponsored [5] - 302:24, 347:7, 351:8, 351:15, 359:11 spot [1] - 521:6 spotted [1] - 404:23 sprayers [1] - 408:4 spraying [1] - 408:13 spread [2] - 385:18, 498:7 spring [3] - 383:7, 383:8, 386:1 square [4] - 289:23, 431:2, 431:5, 431:6 SRA [1] - 453:2 SRWA [1] - 453:6 SS [2] - 453:2, 522:2 SS-S-1 [1] - 259:21 SS-S-2 [1] - 259:23 St [1] - 494:11 Staff [52] - 251:23, 261:3, 261:4, 294:20, 302:14, 315:5, 325:22, 346:21, 346:22, 347:3, 354:6, 369:22, 388:1, 388:6, 394:23, 396:7, 396:17, 396:18, 412:12, 412:18, 414:3, 414:5, 415:18, 421:18, 423:3, 430:22, 442:2, 443:4, 446:23, 449:5, 451:18, 451:20, 452:4, 452:6, 453:20, 454:16, 455:12, 478:12, 482:10, 489:2, 493:12, 493:19, 494:4, 494:23, 495:9, 496:14, 501:7, 502:1, 511:2, 511:9, 518:17, 521:6 STAFF [1] - 251:13 staff [12] - 375:20,	389:1, 394:9, 394:13, 395:7, 396:3, 400:7, 404:17, 404:19, 405:3, 405:14, 406:11 Staff's [7] - 261:3, 261:4, 261:9, 418:8, 422:23, 444:4, 514:11 STAFF'S [3] - 255:19, 256:2, 261:11 stage [1] - 311:10 stand [2] - 262:9, 404:13 standard [20] - 295:11, 341:5, 341:8, 346:24, 347:20, 348:1, 348:8, 348:20, 349:7, 350:22, 351:4, 353:22, 353:23, 354:8, 354:24, 355:2, 355:5, 429:24, 518:5 standards [7] - 316:25, 317:8, 334:24, 343:9, 348:5, 348:8, 378:7 standing [4] - 445:11, 445:23, 446:10, 450:4 standpoint [2] - 317:18, 318:13 stands [2] - 314:10, 498:4 Stanton [2] - 507:23, 508:8 Stanton's [1] - 345:24 starlings [1] - 405:6 start [12] - 290:11, 374:10, 380:4, 416:9, 469:7, 469:8, 469:9, 469:15, 484:17, 485:13, 486:21, 489:23 started [7] - 330:19, 346:17, 350:18, 449:4, 479:24, 484:19, 488:11 starting [5] - 320:12, 418:12, 453:10, 469:16, 472:14 starts [5] - 284:5, 340:22, 352:22, 364:16, 364:23 STATE [2] - 251:2, 522:1 state [31] - 301:3, 307:5, 318:9, 319:2,	321:19, 333:4, 348:23, 351:13, 351:21, 351:24, 354:17, 375:7, 377:1, 377:3, 377:8, 396:14, 398:10, 402:3, 411:7, 411:25, 423:25, 427:6, 439:9, 447:22, 450:1, 452:10, 452:15, 452:17, 483:14, 494:8, 517:10 State [11] - 259:21, 259:23, 301:24, 341:15, 349:7, 351:8, 351:13, 367:3, 377:5, 443:14, 522:7 State's [1] - 433:15 statement [22] - 262:20, 264:20, 332:2, 359:4, 367:18, 370:6, 417:14, 417:15, 418:19, 427:15, 432:7, 432:24, 438:10, 441:9, 478:20, 479:4, 479:6, 483:25, 484:2, 499:2, 511:5, 516:8 statements [4] - 262:12, 411:19, 421:18, 441:9 states [6] - 343:21, 345:3, 347:25, 348:18, 373:20 States [33] - 301:22, 336:4, 336:16, 343:13, 343:21, 347:23, 350:4, 350:8, 350:18, 351:4, 360:22, 363:24, 366:5, 366:19, 371:2, 371:13, 371:16, 373:3, 376:23, 376:25, 377:4, 378:1, 378:3, 380:7, 380:14, 391:2, 393:10, 393:12, 400:21, 402:21, 408:8, 424:7, 428:2 static [3] - 392:18, 392:22, 398:8 stations [1] - 424:10 statistic [1] - 461:24 statistical [1] - 466:20 statistically [1] - 466:9	Status [3] - 259:4, 260:4, 260:17 statute [7] - 367:6, 370:4, 370:13, 370:18, 414:12, 419:2, 419:19 statutory [2] - 419:12, 437:7 stay [2] - 303:6, 368:23 step [9] - 290:1, 300:20, 321:5, 332:21, 374:20, 439:2, 442:12, 493:16, 521:18 stepping [1] - 263:4 steps [1] - 393:21 Steven [4] - 260:18, 308:9, 437:11, 437:14 stick [5] - 270:19, 288:22, 289:1, 297:9 still [19] - 262:10, 294:9, 308:5, 313:2, 320:4, 345:11, 375:1, 389:5, 393:16, 407:12, 431:12, 440:17, 446:9, 480:2, 482:12, 486:13, 498:3, 498:23, 516:23 stipulate [1] - 417:9 stipulated [2] - 275:23, 302:17 stipulation [1] - 415:6 stop [6] - 284:3, 331:21, 382:24, 392:3, 422:18, 432:23 stopover [4] - 391:21, 392:24, 401:19, 401:25 stopovers [1] - 403:17 straight [2] - 427:25, 428:12 Strandburg [1] - 292:22 strategy [3] - 393:25, 394:2, 403:4 stray [1] - 392:10 stream [1] - 377:19 Street [2] - 284:5, 452:13 street [4] - 284:6, 383:18, 383:20, 383:21 Stress [1] - 258:15 stress [11] - 324:13, 336:6, 336:11,	362:17, 362:20, 37 363:8, 363:10, 363:22, 363:24, 364:1, 374:5 stressors [1] - 356:11 stretch [1] - 416:20 stricken [2] - 410:9, 416:22 Strike [8] - 409:16, 413:20, 414:7, 422:5, 422:15, 424:14, 424:18, 425:4 strike [6] - 303:5, 409:19, 411:14, 412:18, 506:14, 506:19 strobing [3] - 341:25, 342:1 strong [1] - 484:7 strongly [1] - 335:12 struck [2] - 412:14, 497:25 structure [2] - 284:18, 287:14 structures [8] - 259:10, 263:19, 278:6, 278:18, 279:4, 290:22, 291:10, 296:20 struggling [1] - 432:15 students [2] - 363:6, 363:14 studied [5] - 279:25, 280:11, 317:23, 355:7, 400:8 Studies [2] - 257:10, 257:10 studies [71] - 262:19, 267:14, 276:19, 276:20, 276:25, 277:7, 277:10, 290:20, 291:6, 291:24, 292:21, 297:19, 299:17, 311:18, 314:13, 316:19, 316:20, 316:24, 317:5, 317:11, 317:12, 317:19, 317:20, 318:2, 319:7, 319:20, 326:5, 326:18, 326:22, 327:22, 336:2, 342:20, 359:22, 361:12, 368:7, 369:2, 375:15, 375:18, 376:20, 377:12, 377:14,
--	---	--	--	---

377:23, 379:18, 380:2, 380:5, 380:11, 380:19, 381:25, 382:2, 382:4, 382:16, 382:17, 382:21, 383:1, 383:2, 385:2, 385:4, 387:9, 391:13, 394:4, 394:5, 394:6, 452:24, 453:4, 472:7, 488:9, 512:22, 513:16 Study [10] - 258:5, 259:6, 259:7, 326:14, 327:9, 328:9, 332:3, 342:19, 359:22, 368:7 study [94] - 262:22, 267:14, 267:18, 275:22, 276:3, 277:3, 277:23, 280:16, 283:25, 288:21, 289:19, 290:5, 290:6, 290:18, 291:4, 291:11, 292:13, 293:17, 295:3, 305:1, 311:20, 314:3, 314:4, 314:6, 314:18, 314:21, 316:17, 316:22, 317:1, 317:6, 318:1, 319:16, 319:17, 320:3, 320:8, 326:4, 326:6, 326:8, 326:9, 326:10, 327:3, 327:4, 327:9, 331:14, 331:16, 332:7, 336:10, 357:8, 360:8, 361:21, 362:9, 362:14, 362:23, 362:24, 363:1, 363:2, 363:3, 363:18, 364:3, 368:9, 370:23, 370:25, 371:1, 371:4, 381:4, 381:11, 385:7, 385:10, 387:8, 391:14, 391:16, 391:23, 455:13, 459:25, 460:3, 460:8, 468:14, 478:4, 481:5, 487:23, 487:24, 488:3, 495:3, 502:5, 508:23, 508:24, 509:4, 511:9,	511:14, 511:15, 513:20 studying [1] - 279:23 stuff [6] - 447:11, 468:13, 468:15, 516:14, 516:16, 517:5 subject [9] - 279:14, 328:12, 386:3, 411:5, 413:20, 415:9, 416:16, 461:22, 462:8 subjective [4] - 299:25, 327:12, 327:13, 327:17 submit [1] - 394:11 submitted [8] - 273:11, 302:17, 311:20, 314:7, 322:1, 357:12, 464:25, 495:3 subscribe [1] - 463:23 subsequent [3] - 274:14, 426:17, 495:4 subset [1] - 305:23 substance [1] - 358:4 substantially [2] - 514:15, 514:17 substantiate [1] - 485:13 subtract [1] - 515:14 subtracting [1] - 287:23 subtraction [1] - 310:8 sudden [1] - 481:15 suddenly [1] - 402:25 sued [1] - 419:17 suggest [4] - 323:2, 329:4, 379:19, 381:2 suggested [2] - 403:12, 438:18 suggestion [1] - 498:21 suggestions [7] - 397:4, 404:3, 496:10, 510:12, 515:24, 515:25, 516:1 suggests [1] - 471:17 suit [1] - 420:18 suitable [8] - 391:17, 391:25, 392:2, 401:19, 401:25, 402:12, 402:14 suite [1] - 452:13 suited [1] - 348:8 SULLY [1] - 522:3 sum [1] - 418:14	summarize [4] - 455:8, 457:1, 457:16, 457:22 summary [3] - 290:13, 312:12, 314:9 summertime [1] - 313:6 sun [7] - 289:1, 344:25, 354:13, 354:14, 354:18, 355:21, 366:13 sun's [4] - 339:3, 339:4, 339:9, 344:1 sunny [1] - 268:21 sunshine [2] - 354:1, 354:16 super [1] - 270:18 supervise [1] - 400:7 supervised [2] - 311:14, 375:16 supplement [1] - 430:14 Supplemental [27] - 257:23, 258:22, 259:5, 259:12, 259:12, 259:13, 259:20, 260:3, 260:12, 261:4, 261:15, 264:13, 273:2, 273:9, 274:12, 318:9, 322:13, 334:8, 357:22, 369:25, 370:3, 376:9, 454:21, 457:2, 457:16, 458:20, 495:5 supplemental [1] - 455:9 supply [3] - 473:25, 483:17 support [6] - 302:12, 347:6, 470:11, 473:13, 474:21, 494:24 supported [3] - 316:19, 316:20, 317:4 supporting [1] - 290:20 supports [3] - 337:2, 398:6, 470:7 suppose [1] - 300:1 supposed [2] - 291:2, 509:23 Supreme [1] - 429:24 surface [1] - 387:15 surfaces [1] - 504:10 surprise [4] - 328:20, 397:17, 397:25,	399:1 surprised [7] - 407:22, 467:7, 473:9, 473:16, 474:7, 474:17, 479:21 surrounding [3] - 461:5, 465:24, 471:4 Survey [8] - 257:5, 257:5, 257:7, 257:7, 257:8, 260:21, 377:21, 383:6 survey [3] - 336:13, 372:12, 394:5 surveys [12] - 361:11, 372:11, 375:18, 376:22, 377:15, 377:16, 377:17, 377:19, 377:20, 382:22 sustain [5] - 292:7, 340:14, 340:15, 340:16, 381:22 sustained [1] - 340:11 sustaining [1] - 450:17 Swanson [42] - 251:18, 253:4, 253:10, 253:14, 254:4, 254:7, 254:11, 254:18, 255:11, 255:14, 255:17, 255:21, 256:4, 256:14, 269:1, 277:16, 299:12, 302:21, 323:21, 337:10, 361:25, 378:15, 409:12, 410:12, 414:18, 415:10, 420:16, 423:20, 432:1, 434:2, 434:6, 436:4, 438:24, 442:21, 443:11, 445:13, 450:21, 451:12, 459:2, 490:11, 497:12, 521:11 SWANSON [58] - 273:13, 273:16, 277:17, 277:20, 283:13, 302:23, 313:11, 323:22, 337:11, 337:13, 340:7, 340:17, 355:16, 378:16, 410:13, 413:12, 416:12, 416:16, 418:18, 420:11, 420:20, 421:7, 421:12, 422:9,	422:14, 422:21, 38 423:2, 423:8, 423:13, 423:21, 423:24, 428:21, 438:25, 439:5, 439:8, 440:9, 440:14, 441:14, 442:22, 442:24, 443:18, 444:1, 444:7, 445:15, 445:18, 446:12, 448:4, 448:7, 450:22, 451:14, 451:24, 459:3, 459:6, 463:1, 490:12, 497:14, 508:13, 521:12 Swanson's [4] - 358:25, 421:3, 422:8, 451:11 SWCA [4] - 259:21, 259:23, 375:9, 375:11 Swedish [1] - 410:25 sweeping [1] - 412:13 swore [1] - 369:16 system [3] - 348:22, 465:12, 512:17
T				
T75.2 [1] - 324:22 table [9] - 280:21, 286:6, 286:11, 338:25, 339:2, 339:5, 339:9, 495:10, 503:2 tables [2] - 280:20, 289:23 Tabular [2] - 259:8, 259:10 talks [1] - 264:24 tall [1] - 325:11 tally [1] - 280:6 targeted [1] - 440:5 task [2] - 291:6, 419:8 Tatanka [2] - 334:6, 514:13 Tax [1] - 257:16 teach [2] - 357:23, 516:6 team [2] - 375:14, 408:24 technical [2] - 494:23, 504:11 technique [1] - 515:13 Telecommunication [1] - 257:10 temperatures [2] - 315:11, 315:15				

tend ^[1] - 313:2 tender ^[2] - 458:23, 497:7 tends ^[1] - 335:16 term ^[4] - 317:17, 429:19, 449:17, 449:22 terms ^[4] - 344:20, 357:18, 358:2, 460:4 test ^[8] - 334:22, 429:25, 441:21, 514:21, 515:2, 517:21, 520:4, 520:10 tested ^[2] - 430:5, 510:8 testified ^[10] - 297:23, 318:5, 332:8, 365:21, 438:5, 453:14, 482:21, 487:21, 490:25 testify ^[6] - 305:25, 414:22, 414:23, 445:1, 445:3, 478:17 testifying ^[9] - 284:3, 292:24, 294:10, 294:11, 307:20, 328:25, 395:25, 410:20, 417:17 testimonies ^[1] - 373:14 testimony ^[76] - 263:8, 273:8, 273:18, 281:20, 285:9, 302:7, 302:10, 302:12, 308:12, 308:20, 310:22, 311:1, 318:8, 319:1, 321:5, 322:18, 322:20, 322:21, 331:25, 332:21, 333:17, 334:14, 334:17, 336:1, 336:24, 337:15, 340:4, 369:12, 369:20, 374:13, 376:15, 376:17, 381:13, 387:11, 388:5, 388:18, 390:1, 393:20, 395:10, 398:10, 400:12, 406:12, 409:21, 409:25, 410:1, 410:2, 410:7, 410:10, 412:5, 421:9, 430:1, 431:15, 432:21, 442:14, 445:2, 452:2, 453:24, 454:12, 455:9,	455:11, 460:19, 469:1, 479:15, 479:20, 480:7, 484:1, 495:1, 495:15, 495:18, 495:21, 497:17, 509:17, 514:1, 515:22, 519:11, 519:17 Testimony ^[67] - 257:12, 257:12, 257:13, 257:14, 257:15, 257:16, 257:23, 258:22, 259:5, 259:12, 259:12, 259:13, 259:20, 260:3, 260:6, 260:6, 260:10, 260:10, 260:11, 260:11, 260:12, 261:12, 261:12, 261:13, 261:14, 261:14, 261:15, 264:13, 266:12, 273:3, 273:10, 274:12, 274:14, 302:1, 302:3, 302:14, 318:9, 322:13, 334:8, 334:10, 336:5, 357:22, 364:10, 369:25, 370:3, 376:6, 376:9, 376:11, 383:5, 385:14, 388:5, 393:19, 394:24, 424:25, 454:21, 457:2, 457:17, 458:20, 465:9, 465:18, 495:5, 495:6, 495:13, 496:16, 497:19, 509:22, 511:13 testing ^[11] - 315:9, 315:12, 477:23, 494:20, 500:18, 501:2, 512:11, 512:12, 513:17, 515:3, 520:3 Texas ^[1] - 399:2 THE ^[212] - 251:1, 251:2, 251:4, 251:10, 263:16, 263:21, 264:4, 264:11, 265:3, 265:6, 265:10, 265:17, 266:2, 266:10, 266:19, 267:1, 267:9, 267:12, 267:16, 267:20, 267:25,	268:3, 268:14, 268:24, 269:6, 269:10, 269:18, 270:2, 270:10, 270:13, 271:4, 271:14, 271:22, 272:9, 273:4, 273:8, 273:19, 273:24, 274:11, 274:23, 297:22, 298:1, 298:9, 299:3, 299:8, 299:16, 299:19, 299:25, 300:6, 300:13, 316:14, 316:16, 316:21, 317:21, 318:1, 318:7, 318:17, 318:20, 319:5, 319:14, 319:18, 319:22, 320:5, 320:10, 320:14, 321:6, 325:18, 326:1, 326:7, 326:13, 326:20, 327:3, 327:24, 328:2, 328:16, 329:2, 329:7, 329:9, 329:14, 329:20, 330:16, 330:24, 331:3, 331:18, 332:3, 332:23, 354:20, 369:21, 371:25, 372:4, 372:6, 373:17, 387:22, 396:22, 396:24, 397:5, 397:12, 397:15, 397:19, 397:23, 398:2, 398:6, 398:18, 398:23, 399:9, 399:13, 399:18, 399:23, 400:3, 400:7, 400:24, 401:4, 401:12, 401:15, 402:6, 403:14, 404:7, 404:14, 405:12, 405:25, 406:5, 408:3, 408:21, 409:5, 430:18, 431:10, 432:8, 432:11, 432:13, 433:4, 433:6, 433:9, 433:19, 434:12, 434:16, 435:5, 435:7, 435:13, 435:18, 435:20, 435:23, 436:1, 436:10, 436:14, 436:17, 436:20,	436:23, 437:1, 437:10, 437:15, 437:17, 437:20, 438:11, 438:15, 438:20, 440:18, 442:19, 451:6, 468:12, 468:16, 468:19, 469:2, 469:13, 469:24, 471:15, 472:3, 475:7, 475:24, 476:19, 476:22, 477:5, 477:21, 478:18, 478:21, 479:2, 479:10, 479:14, 479:18, 480:12, 482:6, 482:19, 483:3, 483:22, 483:24, 484:4, 484:6, 485:5, 485:9, 485:11, 485:17, 485:21, 486:18, 487:12, 488:5, 488:25, 493:17, 511:20, 513:23, 514:3, 514:9, 514:15, 514:20, 515:3, 515:18, 516:3, 516:18, 517:8, 517:16, 518:8, 518:16, 521:19 theirs ^[1] - 476:16 theory ^[3] - 411:21, 510:20, 512:7 therefore ^[6] - 304:14, 319:10, 323:14, 340:24, 341:2, 362:17 therein ^[1] - 415:1 thereunder ^[1] - 414:11 thesis ^[1] - 356:15 they've ^[2] - 320:10, 397:8 thin ^[1] - 268:22 thinking ^[4] - 268:6, 289:9, 380:2, 437:9 thinner ^[1] - 271:18 Third ^[1] - 261:3 Thomas ^[1] - 322:8 THOMPSON ^[1] - 253:17 Thompson ^[5] - 257:13, 257:13, 259:12, 260:11, 509:17 thorough ^[2] - 468:17, 469:17 thoughts ^[3] - 411:2,	411:4, 426:10 threats ^[2] - 411:7, 411:10 three ^[23] - 285:18, 293:14, 321:11, 333:13, 333:16, 350:1, 357:10, 359:2, 359:5, 359:12, 365:3, 365:15, 398:13, 403:25, 419:3, 433:24, 437:6, 467:1, 469:10, 506:3, 508:5, 509:5, 515:21 three-quarters ^[1] - 293:14 threshold ^[6] - 277:8, 299:7, 303:24, 304:15, 308:5, 341:8 thresholds ^[4] - 299:4, 322:23, 323:16, 337:3 throughout ^[6] - 357:9, 373:14, 434:5, 443:14, 496:13, 507:10 throw ^[1] - 427:21 thumb ^[1] - 287:19 thunder ^[1] - 306:24 tie ^[1] - 370:20 tight ^[1] - 266:22 Tim ^[1] - 294:4 timed ^[1] - 366:15 timing ^[3] - 475:18, 481:12, 486:13 tin ^[1] - 429:10 tinnitus ^[7] - 327:22, 327:25, 328:2, 328:10, 328:22, 328:25, 329:5 tiny ^[1] - 268:11 tip ^[2] - 366:9, 366:22 title ^[9] - 301:3, 321:19, 333:4, 349:1, 375:7, 452:14, 494:15, 500:1 titled ^[1] - 336:6 to-be-submitted ^[1] - 302:17 today ^[20] - 276:25, 277:5, 290:24, 291:8, 333:17, 355:24, 357:13, 365:22, 389:5, 390:1, 393:20, 415:8, 424:22, 430:2, 439:15, 454:11, 495:2,
---	--	---	--	--

495:18, 516:13, 519:11 together ^[10] - 312:12, 314:9, 315:22, 326:3, 346:9, 408:23, 423:15, 470:1, 474:17, 510:10 Tom ^[3] - 345:24, 507:23, 508:8 tomorrow ^[1] - 521:23 tonight ^[1] - 423:17 took ^[8] - 269:23, 269:25, 276:3, 414:18, 445:6, 464:3, 476:14, 522:9 top ^[9] - 268:11, 268:22, 283:23, 284:1, 287:19, 295:2, 346:3, 367:8, 504:9 topic ^[1] - 468:19 topography ^[1] - 332:11 Toronto ^[1] - 465:10 total ^[5] - 265:19, 281:2, 281:6, 418:14, 478:10 totally ^[1] - 499:6 tough ^[3] - 479:18, 480:2, 486:14 toward ^[1] - 416:22 Toward ^[1] - 258:9 towards ^[5] - 323:9, 372:19, 379:24, 452:25, 473:11 tower ^[17] - 456:8, 456:20, 456:22, 457:14, 458:1, 458:10, 470:9, 470:12, 477:11, 477:16, 480:2, 481:3, 481:16, 481:21, 486:12 towers ^[14] - 455:14, 458:5, 461:11, 467:12, 470:18, 471:5, 472:12, 473:8, 473:20, 481:24, 486:6, 488:6, 488:20, 492:20 toxicology ^[1] - 356:7 traditional ^[1] - 377:22 Traditional ^[1] - 259:22 traffic ^[5] - 279:13, 312:7, 343:18, 345:1, 345:10 trailing ^[2] - 510:3,	510:5 train ^[2] - 388:23, 405:14 trained ^[3] - 322:9, 405:3, 418:20 training ^[4] - 361:9, 388:21, 394:9, 395:7 Training ^[1] - 252:2 trample ^[1] - 404:23 transaction ^[14] - 456:11, 457:3, 457:5, 457:10, 457:12, 458:9, 463:18, 464:9, 465:6, 466:6, 471:17, 491:18, 491:19, 493:6 transactions ^[17] - 455:17, 455:18, 456:4, 457:25, 460:9, 460:14, 460:22, 460:23, 463:20, 464:13, 475:1, 477:15, 483:10, 485:22, 488:5, 488:8, 488:13 Transcript ^[1] - 251:7 transcript ^[1] - 252:1 transcription ^[1] - 522:12 transfer ^[2] - 466:18, 466:24 transfers ^[1] - 478:10 transition ^[1] - 435:15 translation ^[3] - 352:16, 352:19, 353:11 transparency ^[2] - 396:4, 396:9 transparent ^[1] - 396:3 trapezoid ^[1] - 289:8 travel ^[2] - 282:23, 426:24 travelers ^[1] - 384:17 traveling ^[1] - 366:23 tree ^[1] - 428:9 trees ^[12] - 263:19, 268:7, 278:6, 278:19, 344:2, 344:3, 344:17, 344:20, 429:11, 429:14, 518:12 trend ^[1] - 488:16 trends ^[1] - 361:18 trespasser ^[1] - 432:18 trespassing ^[1] - 432:17 trial ^[1] - 283:9	tribal ^[1] - 378:5 tribes ^[1] - 377:22 tributary ^[1] - 387:1 tried ^[3] - 270:20, 480:4, 486:3 tries ^[1] - 396:3 trip ^[1] - 423:6 troubling ^[1] - 328:3 truck ^[1] - 266:18 true ^[11] - 298:7, 360:18, 401:5, 417:14, 428:16, 441:11, 454:23, 495:21, 499:21, 522:11 trust ^[2] - 410:25, 428:13 trusting ^[1] - 423:4 truth ^[4] - 410:18, 418:19, 429:25, 441:21 try ^[8] - 271:17, 359:1, 372:10, 446:13, 447:14, 448:18, 468:16, 478:24 trying ^[25] - 272:5, 297:13, 305:17, 310:20, 315:21, 338:2, 360:4, 361:4, 386:13, 420:21, 421:8, 427:25, 437:5, 444:4, 445:6, 445:10, 451:8, 466:16, 486:10, 491:1, 491:16, 497:20, 498:1, 509:11, 515:10 Tuesday ^[1] - 413:18 Turbine ^[13] - 258:3, 258:4, 258:6, 258:7, 258:10, 259:4, 259:14, 259:16, 259:22, 260:5, 265:1, 265:4, 275:7 turbine ^[89] - 264:18, 265:18, 265:22, 271:8, 271:12, 271:15, 271:25, 272:2, 274:5, 274:9, 276:9, 278:3, 280:3, 280:12, 280:24, 281:7, 281:18, 283:24, 284:11, 284:19, 284:20, 284:22, 285:6, 285:16, 287:7, 289:9, 289:13, 289:14, 291:13, 293:18, 293:21, 294:3, 297:21,	297:22, 298:13, 298:19, 298:24, 298:25, 299:2, 303:18, 304:10, 304:17, 304:20, 305:6, 324:25, 325:2, 325:4, 325:6, 325:10, 325:11, 327:5, 334:4, 342:8, 343:17, 344:14, 344:24, 354:3, 379:1, 383:11, 384:12, 384:21, 388:25, 427:22, 430:7, 440:22, 441:3, 454:4, 455:3, 455:25, 456:5, 462:1, 463:13, 463:21, 496:21, 497:24, 503:9, 505:6, 505:16, 505:21, 506:16, 509:20, 510:17, 511:4, 516:19 turbine-by-turbine ^[2] - 281:7, 281:18 turbines ^[103] - 262:18, 262:21, 262:24, 264:22, 264:23, 270:4, 271:7, 276:1, 276:16, 276:18, 280:1, 280:13, 280:19, 281:12, 281:15, 285:10, 288:17, 288:18, 297:4, 297:5, 303:1, 308:8, 317:14, 318:10, 319:3, 319:10, 323:3, 323:10, 325:8, 327:2, 327:7, 327:11, 332:12, 335:10, 335:13, 335:18, 335:22, 336:11, 338:13, 339:1, 339:2, 339:10, 342:14, 347:22, 359:16, 364:25, 365:7, 366:4, 366:8, 366:10, 366:19, 366:21, 372:2, 372:14, 372:19, 373:5, 374:2, 374:8, 378:7, 379:2, 379:3, 379:20, 380:19, 380:22, 381:2, 383:16, 384:6, 408:19, 426:13, 428:12, 428:14,	429:16, 440:6, 40 440:20, 455:14, 459:22, 460:13, 460:25, 461:4, 462:15, 464:8, 464:13, 465:23, 474:11, 493:2, 496:24, 497:1, 497:3, 498:1, 498:7, 498:14, 502:12, 507:1, 507:4, 507:6, 508:25, 511:4, 512:4, 512:8, 513:5, 520:7 Turbines ^[16] - 257:19, 257:21, 258:11, 258:12, 258:14, 258:15, 258:16, 258:17, 258:18, 258:19, 258:22, 259:15, 259:18, 259:19, 260:5, 336:7 turbulence ^[2] - 434:20, 503:10 turn ^[10] - 294:25, 295:15, 295:16, 296:10, 390:18, 420:10, 496:4, 519:16, 520:7, 520:12 turning ^[1] - 462:15 TW-1 ^[1] - 257:14 TW-S-1 ^[1] - 260:3 TW-S-2 ^[1] - 260:4 TW-S-3 ^[1] - 260:4 TW-S-4 ^[1] - 260:5 tweaked ^[1] - 514:21 twenty ^[1] - 470:23 twenty-sixth ^[1] - 470:23 twice ^[4] - 308:23, 309:11, 309:12, 309:13 two ^[44] - 262:2, 264:22, 264:23, 269:20, 276:17, 277:18, 280:1, 284:15, 284:18, 284:22, 284:24, 288:7, 289:21, 291:6, 291:12, 291:13, 292:20, 297:17, 309:14, 310:18, 341:23, 371:8, 388:25, 398:12, 404:1, 405:3, 407:21, 409:18, 413:18, 439:16, 443:6,
--	---	---	---	--

443:10, 462:9, 464:24, 469:10, 477:7, 487:23, 489:22, 490:5, 491:3, 497:4, 504:23, 510:10, 520:11 two-page [1] - 439:16 two-part [1] - 371:8 Tyler [9] - 257:14, 257:14, 260:3, 260:12, 285:3, 404:16, 438:7, 443:1, 443:10 TYLER [3] - 253:3, 255:6, 255:16 type [15] - 281:23, 282:6, 310:19, 326:18, 338:24, 363:12, 402:9, 420:18, 436:18, 455:3, 472:7, 515:1, 515:3 types [3] - 268:14, 370:15, 402:9 typical [4] - 267:2, 481:14, 491:4, 505:3 typically [8] - 303:22, 319:5, 350:5, 361:14, 367:25, 387:14, 503:20, 504:4	279:8, 315:15, 318:23, 370:15, 378:6, 407:12, 409:23, 410:6, 412:4, 414:11, 419:1, 419:10, 427:22, 427:23, 446:9, 505:1, 520:9 underlying [1] - 335:14 understood [3] - 405:21, 518:13 undertake [1] - 443:3 undertaking [1] - 310:11 undertook [1] - 391:14 undue [2] - 358:10, 374:5 unduly [1] - 361:6 unfortunately [1] - 492:15 uninfluenced [1] - 474:23 unique [2] - 316:21, 457:24 unit [1] - 498:15 United [31] - 301:22, 336:4, 336:16, 343:13, 343:21, 347:23, 350:4, 350:8, 350:18, 351:4, 360:22, 363:24, 366:5, 366:19, 371:2, 371:13, 371:16, 373:3, 376:23, 376:25, 377:4, 378:1, 378:3, 380:7, 380:14, 391:2, 393:10, 393:12, 400:21, 402:21, 424:6 units [5] - 498:13, 498:22, 504:15, 520:13 universities [1] - 484:9 University [8] - 322:6, 322:7, 322:8, 322:10, 333:21, 362:14, 376:5, 452:23 unless [5] - 271:4, 340:13, 405:10, 420:13, 519:8 unlike [2] - 355:2, 487:14 unlivable [1] - 365:2 unnamed [1] - 387:1	unnecessary [1] - 287:10 unprotected [1] - 331:7 unrealistic [1] - 287:6 unrealistically [1] - 287:8 unredacted [1] - 422:16 unrelated [1] - 309:25 unsurprising [1] - 328:23 unusual [1] - 446:4 up [80] - 262:9, 264:25, 266:6, 270:13, 273:6, 274:11, 275:2, 280:2, 283:11, 285:4, 290:4, 290:8, 291:5, 291:8, 293:16, 294:24, 295:20, 296:7, 297:24, 300:12, 307:25, 310:10, 313:6, 315:18, 316:8, 319:13, 320:8, 320:12, 327:19, 328:7, 328:20, 331:13, 331:14, 352:10, 353:3, 356:18, 360:8, 361:21, 369:13, 372:9, 383:14, 395:23, 397:23, 399:4, 399:10, 399:22, 400:25, 409:12, 412:5, 415:20, 419:7, 422:7, 423:7, 427:22, 429:23, 431:25, 432:21, 443:2, 443:4, 445:8, 445:22, 462:13, 464:5, 469:10, 471:10, 474:8, 479:19, 479:22, 487:4, 487:15, 489:22, 491:13, 491:23, 492:5, 497:2, 501:6, 513:11, 518:9, 518:13, 519:10 upcoming [1] - 411:15 update [3] - 455:12, 460:7, 478:3 Update [1] - 258:20 updated [2] - 326:21, 376:7 Updates [1] - 257:19 updating [1] - 488:13	uses [4] - 370:8, 370:10, 370:13, 515:13 Utah [1] - 494:11 UTILITIES [2] - 251:1, 251:10 Utilities [3] - 396:4, 396:10, 500:8 utility [1] - 507:19 utilize [1] - 447:23 UTM [1] - 259:11	versus [6] - 384:17, 41 384:22, 384:25, 461:11, 517:17 vibration [1] - 434:20 vibrations [1] - 365:1 vibroacoustic [1] - 324:19 vice [3] - 494:16, 494:17, 520:14 VICE [1] - 251:11 Vicinity [1] - 258:14 vicinity [1] - 365:16 view [8] - 289:8, 329:24, 332:9, 412:13, 414:19, 430:10, 434:19, 470:13 virtue [2] - 419:2, 419:19 visit [2] - 472:20, 489:15 visited [3] - 462:15, 462:17, 489:21 visits [2] - 387:7, 472:22 visual [5] - 293:3, 323:10, 335:12, 337:1, 434:19 Vitae [2] - 257:23, 259:14 Volume [1] - 251:9 volume [1] - 328:11 vote [4] - 405:9, 420:25, 421:5, 450:14 votes [1] - 421:24
U				
U.S [15] - 336:12, 336:14, 336:18, 341:12, 348:7, 349:9, 350:5, 350:12, 353:23, 354:9, 355:2, 363:2, 370:24, 390:10, 391:5 UK [1] - 258:20 ultimately [2] - 327:19, 330:3 unable [2] - 413:22, 426:24 unanswered [1] - 445:21 uncertainty [3] - 318:10, 319:2, 510:16 uncomfortable [1] - 487:15 Under [2] - 258:19, 259:19 under [22] - 262:10, 275:16, 275:22, 276:25, 277:10,				
				W
				wait [1] - 487:6 waited [2] - 270:15, 450:24 waive [2] - 413:18, 415:7 waiver [1] - 334:25 waiving [1] - 297:9 wake [1] - 434:20 walk [4] - 275:15, 276:13, 379:17, 515:4 walk-in [1] - 379:17 walker [1] - 512:16 wall [3] - 278:4, 278:11, 288:15 wants [3] - 292:24, 476:10, 484:12 washing [1] - 308:3 waste [2] - 356:22, 357:3 watch [2] - 319:25,

488:15 water [4] - 377:2, 387:13, 387:14, 387:16 Water [1] - 377:2 Watertown [7] - 456:18, 465:13, 466:20, 467:17, 484:9, 484:12, 488:2 wave [1] - 517:2 Waverly [3] - 456:16, 478:9, 479:21 waves [4] - 282:15, 282:21, 306:8, 307:18 ways [5] - 309:2, 309:4, 316:24, 317:4, 462:9 weather [1] - 316:1 weed [1] - 385:19 weed-free [1] - 385:19 weeds [2] - 338:24, 385:18 weight [2] - 334:19, 368:23 weird [1] - 422:15 welcome [9] - 316:15, 319:14, 369:21, 384:3, 396:23, 452:10, 513:23, 518:16, 521:19 welcoming [1] - 444:16 welfare [5] - 322:24, 323:16, 335:4, 335:8, 337:5 west [14] - 278:5, 278:9, 278:11, 278:17, 293:13, 294:2, 339:3, 339:9, 428:9, 440:8, 440:25, 441:3, 441:5, 490:4 Western [1] - 452:23 wet [3] - 400:22, 400:25, 401:21 wetland [6] - 377:19, 378:4, 380:7, 380:17, 391:18, 402:10 wetlands [7] - 378:6, 391:19, 391:24, 401:18, 402:6, 402:8, 402:11 wetness [2] - 401:13, 401:18 wetter [1] - 401:22 wherein [1] - 483:6 white [3] - 296:25, 431:2, 431:5	whole [11] - 263:25, 379:7, 379:14, 379:15, 414:23, 429:6, 471:21, 492:11, 507:10, 513:12 whooping [57] - 377:17, 380:17, 382:14, 388:7, 388:14, 388:23, 390:11, 390:17, 391:6, 391:12, 391:14, 391:16, 391:17, 391:18, 391:19, 391:25, 392:2, 392:4, 392:8, 392:11, 392:15, 392:17, 393:5, 393:14, 393:21, 393:23, 394:5, 394:9, 394:17, 394:23, 395:2, 395:23, 396:11, 397:1, 398:21, 398:23, 399:15, 399:20, 400:8, 400:13, 401:2, 401:17, 401:21, 402:5, 402:12, 402:19, 402:23, 402:25, 404:20, 405:2, 406:12, 406:23, 420:3, 420:4, 420:6, 428:4, 514:7 whoops [1] - 431:3 whooshing [1] - 505:11 WHOQOL [1] - 258:13 WHOQOL-BREF [1] - 258:13 WI [1] - 260:22 wide [4] - 266:15, 270:16, 270:19, 453:9 width [1] - 272:20 Wildlife [15] - 376:24, 376:25, 377:4, 378:1, 378:4, 380:7, 380:14, 389:22, 390:6, 390:10, 391:2, 391:6, 393:11, 393:13, 402:22 wildlife [13] - 358:22, 375:15, 375:17, 379:15, 379:17, 379:21, 380:6, 385:2, 385:8, 393:25, 394:1,	399:3, 403:3 WILHELM [3] - 253:3, 255:6, 255:16 Wilhelm [15] - 257:14, 257:14, 260:3, 260:12, 274:5, 384:6, 407:3, 407:11, 407:14, 443:1, 445:22, 446:9, 446:13, 448:8, 451:16 willing [3] - 408:9, 408:19, 417:9 willingness [1] - 502:12 wind [166] - 262:4, 268:16, 269:16, 269:17, 271:7, 271:8, 271:15, 271:25, 272:13, 279:10, 279:11, 280:1, 284:18, 284:20, 284:22, 285:16, 287:6, 287:9, 291:13, 293:18, 296:21, 301:22, 303:1, 304:10, 304:20, 305:6, 306:11, 306:12, 306:23, 307:19, 307:20, 308:7, 310:3, 312:7, 312:23, 312:24, 317:14, 318:6, 318:10, 319:3, 319:10, 323:1, 323:3, 323:9, 323:12, 323:15, 324:25, 325:2, 325:6, 325:8, 325:10, 325:11, 327:2, 327:5, 327:6, 327:10, 328:25, 332:12, 334:3, 334:23, 335:9, 335:10, 335:18, 335:22, 336:11, 336:14, 336:16, 336:23, 339:1, 342:13, 344:7, 344:13, 347:22, 354:2, 359:16, 364:24, 365:8, 365:11, 366:4, 366:8, 366:12, 371:7, 371:13, 372:2, 372:14, 374:1, 374:8, 375:16, 407:18, 408:11, 411:2,	419:1, 419:22, 425:19, 426:11, 426:19, 434:22, 440:6, 441:3, 453:16, 454:4, 455:14, 455:25, 456:4, 456:7, 456:20, 456:21, 457:14, 458:1, 458:5, 458:10, 459:20, 459:22, 460:10, 460:13, 461:4, 461:16, 461:21, 462:1, 463:13, 463:21, 465:23, 466:10, 467:12, 470:9, 470:12, 471:4, 473:20, 474:10, 477:11, 477:16, 480:1, 481:3, 481:24, 481:25, 482:9, 486:6, 486:12, 488:6, 488:19, 492:6, 492:7, 497:24, 498:24, 499:19, 500:11, 500:25, 501:18, 501:20, 502:2, 503:6, 503:9, 503:10, 503:11, 503:15, 505:6, 505:16, 506:20, 506:25, 507:10, 509:1, 512:22, 520:9 WIND [2] - 251:4, 251:5 Wind [71] - 251:17, 257:19, 258:3, 258:4, 258:6, 258:7, 258:9, 258:11, 258:12, 258:14, 258:15, 258:16, 258:17, 258:18, 258:19, 258:22, 259:14, 259:15, 259:15, 259:17, 259:18, 259:19, 259:22, 260:16, 260:22, 262:4, 277:11, 283:25, 285:7, 301:13, 302:16, 314:2, 314:12, 314:17, 314:21, 321:24, 322:23, 323:15, 325:3, 333:10, 333:11, 333:12, 334:22, 335:20, 336:1, 336:6, 337:4, 337:5, 356:21,	357:7, 359:12, 365:4, 365:5, 375:12, 376:19, 376:24, 379:20, 380:12, 385:18, 386:18, 393:22, 413:5, 413:6, 456:17, 501:8, 502:16, 508:20, 509:7, 510:2, 510:11, 518:23 wind-driven [1] - 268:16 windier [1] - 312:22 window [7] - 263:15, 278:23, 289:19, 338:20, 342:3, 505:20, 506:2 windows [14] - 263:12, 263:13, 263:18, 263:19, 278:4, 278:10, 289:6, 289:8, 289:10, 429:6, 429:15, 430:8, 440:25 winds [2] - 287:12, 312:20 Winds [1] - 487:20 winter [3] - 386:5, 386:6, 504:7 wintertime [2] - 385:24, 386:1 Wisconsin [8] - 365:5, 399:11, 399:12, 508:21, 509:8, 519:2, 519:5, 519:6 wish [15] - 400:17, 404:10, 414:24, 422:9, 422:10, 424:25, 425:8, 427:10, 427:14, 428:20, 439:22, 443:21, 444:2, 488:22, 492:14 wishes [2] - 411:13, 412:18 withstand [1] - 287:12 WITNESS [207] - 263:16, 263:21, 264:4, 264:11, 265:3, 265:6, 265:10, 265:17, 266:2, 266:10, 266:19, 267:1, 267:9, 267:12, 267:16, 267:20, 267:25, 268:3, 268:14, 268:24, 269:6, 269:10,
--	--	---	---	---

269:18, 270:2, 270:10, 270:13, 271:4, 271:14, 271:22, 272:9, 273:4, 273:8, 273:19, 273:24, 274:11, 274:23, 297:22, 298:1, 298:9, 299:3, 299:8, 299:16, 299:19, 299:25, 300:6, 300:13, 316:14, 316:16, 316:21, 317:21, 318:1, 318:7, 318:17, 318:20, 319:5, 319:14, 319:18, 319:22, 320:5, 320:10, 320:14, 321:6, 325:18, 326:1, 326:7, 326:13, 326:20, 327:3, 327:24, 328:2, 328:16, 329:2, 329:7, 329:9, 329:14, 329:20, 330:16, 330:24, 331:3, 331:18, 332:3, 332:23, 354:20, 369:21, 371:25, 372:4, 372:6, 373:17, 387:22, 396:22, 396:24, 397:5, 397:12, 397:15, 397:19, 397:23, 398:2, 398:6, 398:18, 398:23, 399:9, 399:13, 399:18, 399:23, 400:3, 400:7, 400:24, 401:4, 401:12, 401:15, 402:6, 403:14, 404:7, 404:14, 405:12, 405:25, 406:5, 408:3, 408:21, 409:5, 430:18, 431:10, 432:8, 432:11, 432:13, 433:4, 433:6, 433:9, 433:19, 434:12, 434:16, 435:5, 435:7, 435:13, 435:18, 435:20, 435:23, 436:1, 436:10, 436:14, 436:17, 436:20, 436:23, 437:1, 437:10, 437:15,	437:17, 437:20, 438:11, 438:15, 438:20, 440:18, 442:19, 451:6, 468:12, 468:16, 468:19, 469:2, 469:13, 469:24, 471:15, 472:3, 475:7, 475:24, 476:19, 476:22, 477:5, 477:21, 478:18, 478:21, 479:2, 479:10, 479:14, 479:18, 480:12, 482:6, 482:19, 483:3, 483:22, 483:24, 484:4, 484:6, 485:5, 485:9, 485:11, 485:17, 485:21, 486:18, 487:12, 488:5, 488:25, 493:17, 511:20, 513:23, 514:3, 514:9, 514:15, 514:20, 515:3, 515:18, 516:3, 516:18, 517:8, 517:16, 518:8, 518:16, 521:19 witness [51] - 262:9, 274:5, 292:25, 295:5, 296:7, 300:21, 300:22, 302:14, 302:19, 313:12, 321:1, 321:7, 321:8, 323:23, 332:24, 374:21, 394:24, 395:2, 404:13, 405:22, 406:6, 409:6, 409:24, 410:15, 410:20, 423:20, 428:22, 439:3, 439:4, 440:14, 441:14, 442:23, 442:24, 442:25, 443:6, 443:10, 443:25, 444:1, 451:12, 451:17, 451:23, 452:5, 458:23, 478:13, 493:18, 493:19, 493:20, 497:8, 503:24, 508:14, 521:20 Witness [2] - 295:25, 390:5 WITNESSES [6] - 253:2, 254:2, 255:2, 255:9, 255:19, 256:2	witnesses [9] - 305:25, 321:11, 346:4, 411:17, 411:19, 412:2, 415:8, 443:20, 443:23 Wittler [3] - 251:24, 522:17, 522:18 WITTLER [1] - 522:5 Women's [1] - 321:22 wonderful [1] - 419:13 wonderland [1] - 379:16 word [4] - 269:2, 345:16, 349:15, 516:12 wording [1] - 360:13 words [5] - 312:15, 349:15, 360:3, 365:3, 410:3 works [3] - 269:22, 338:6, 438:8 world [3] - 342:21, 400:1, 471:22 world's [1] - 327:10 worrying [1] - 351:1 worse [1] - 437:11 worst [3] - 287:12, 353:24, 354:12 wrap [1] - 437:5 wrestled [1] - 416:19 wrist [1] - 327:15 write [3] - 265:16, 356:16, 360:13 writing [3] - 369:11, 369:14, 369:15 writings [1] - 477:17 written [4] - 403:9, 497:17, 499:22, 500:2 wrote [5] - 302:25, 365:22, 432:1, 470:4, 507:22 WTG's [1] - 259:11	315:11, 329:12, 330:7, 347:16, 349:20, 353:5, 353:19, 354:14, 354:19, 355:1, 359:10, 359:14, 360:1, 360:4, 360:6, 360:24, 382:8, 404:1, 425:25, 436:24, 467:10, 470:23, 482:9 years [27] - 272:5, 301:20, 310:18, 325:7, 330:6, 333:23, 334:2, 334:21, 347:15, 361:10, 363:25, 375:23, 382:18, 397:18, 400:23, 400:25, 403:19, 404:1, 436:24, 459:7, 463:24, 475:3, 487:23, 488:3, 488:23, 508:9 yellow [1] - 440:22 yesterday [16] - 262:12, 262:17, 263:7, 263:9, 272:16, 276:12, 283:3, 283:20, 285:4, 285:11, 407:16, 443:5, 446:20, 478:17, 485:1, 518:3 Young [1] - 376:5 yourself [2] - 398:20, 448:8
Z			
zero [6] - 272:19, 282:11, 282:13, 287:1, 298:4, 518:2 Zone [1] - 259:11 zoning [1] - 357:11			
X			
Xcel [3] - 407:24, 407:25, 408:7			
Y			
yard [8] - 342:9, 342:17, 474:9, 490:4, 490:18, 491:5, 491:8, 491:14 yards [1] - 435:18 year [29] - 263:11, 266:3, 274:3, 274:7, 289:25, 310:18,			