BEFORE THE OHIO POWER SITING BOARD

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In the Matter of the Application of Champaign Wind LLC for a Certificate to Construct a Wind-Powered Electric Generating Facility in Champaign County, Ohio.	: : : : : :	Case No. 12-0160-EL-BGN

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PROCEEDINGS

before Ms. Mandy Willey Chiles and Mr. Jonathan Tauber, Administrative Law Judges, at the Public Utilities Commission of Ohio, 180 East Broad Street, Room 11-D, Columbus, Ohio, called at 1:30 p.m. on Thursday, December 6, 2012.

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VOLUME XII

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On behalf of the Staff of the
Ohio Power Siting Board.

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REBUTTAL TESTIMONY

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Thursday Afternoon Session,
December 6, 2012.

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ALJ TAUBER: Let's go on the record.

ALJ CHILES: The Ohio Power Siting Board has set for hearing at this time and place, Case No. 12-0160-EL-BGN, being In the Matter of the Application of Champaign Wind LLC for a Certificate to Construct a Wind-Powered Electric Generating Facility in Champaign County, Ohio.

I will remark this is our first day and possibly our last day of rebuttal. At this time we will take appearances of the parties, beginning with the company.

MR. SETTINERI: Thank you, on behalf of the Applicant, Champaign Wind LLC, M. Howard Petricoff, Michael Settineri, Stephen Howard, Gretchen Petrucci, Miranda Leppla, Vorys, Sater, Seymour and Pease, 52 East Gay Street, Columbus, Ohio.

ALJ TAUBER: Thank you.

Mr. Van Kley.

MR. VAN KLEY: Jack Van Kley and Christopher Walker, Van Kley & Walker, on behalf of Union Neighbors United, Robert and Diane McConnell

and Julia Johnson.

ALJ CHILES: The county and townships.

MS. NAPIER: Jane Napier, assistant prosecutor, Champaign County, for Champaign County and the townships of Union, Goshen, and Urbana.

ALJ CHILES: On behalf of the city.

MS. PARCELS: On behalf of the city of Urbana, staff attorney Breanne M. Parcels, under the supervision of Law Director Gil Weithman.

ALJ TAUBER: Thank you.

ALJ CHILES: Staff.

MR. MARGARD: Thank you, your Honors. On behalf of the Board Staff, Stephen Reilly, Devin Parram, Werner Margard, Sarah Anderson, and Summer Plantz, assistant attorneys generals.

ALJ CHILES: Thank you.

Is the company ready to proceed?

MR. SETTINERRI: Yes, your Honor. Thank you, your Honor. At this time we would like to call Dr. Kenneth Mundt to the stand.

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(Witness sworn.)

MR. SETTINERRI: At this time we would like to mark as Company Exhibit 29 the Rebuttal Testimony of Kenneth A. Mundt.

ALJ TAUBER: The exhibit is so marked.

(EXHIBIT MARKED FOR IDENTIFICATION.)

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KENNETH A. MUNDT

being first duly sworn, as prescribed by law, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. Settinerri:

Q. Would you please state your name and business address for the record, please?

A. Kenneth A. Mundt. The business address is 28 Amity Street, Amherst, Massachusetts, 01002.

Q. And, Dr. Mundt, if you could please identify what has been marked as Company Exhibit 29 for me.

A. This is a copy of my direct testimony and a copy of my CV.

Q. And would this be a copy of your rebuttal testimony, sir?

A. Yes, it is.

Q. At this time do you have any changes or revisions to your testimony?

A. Yes, I do.

Q. And what would those revisions be please?

A. They all pertain to the reference list

that follows the rebuttal testimony, page 39.

Q. If you could please read your revisions for the court reporter.

A. The first is a correction to the first reference listed, "Ambrose, E.S." should read "Ambrose, S.E."

I would additionally like to include four references that are cited within the text of the rebuttal testimony but do not appear on the reference list.

The first is "Salt, A.N. & Huller, T.E., (2010). Responses of the ear to low frequency sounds, infrasound and wind turbines, Hearing Research, 268, 12-21."

The second is --

ALJ TAUBER: I would ask you to repeat that one more time so we can get everything written down.

THE WITNESS: Certainly.

A. The first reference is "Salt, A.N. & Huller, T.E., (2010). Responses of the ear to low frequency sounds, infrasound and wind turbines, Hearing Research, 268, 12-21."

The second is "Salt, A.N and Kaltenbach, J.A., (2011). Infrasound from wind turbines could

affect humans. Bulletin of Science, Technology & Society, 31, (4), 296-302."

The third is "Salt, A.N., & Lichtenhan, J.T., (August 2012). Perception-based protection from low-frequency sounds may not be enough. Presentation at InterNoise Conference, New York City, NY."

The final one is "Nissenbaum, M.A., Aramini, J. J., & Hanning, C.D., (2012). Effects of industrial wind turbine noise on sleep health. Noise & Health, 14, (60), 237-243."

That's it.

Q. Do you have any other revisions or changes to your testimony, sir?

A. No, sir.

Q. At this time if I would ask you the questions in your rebuttal testimony, would your answers be the same today?

A. Yes, sir, they would.

MR. SETTINERRI: At this time, your Honors, I present the witness for cross-examination.

ALJ CHILES: Thank you.

Ms. Parcels.

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CROSS-EXAMINATION

By Ms. Parcels:

Q. Dr. Mundt, I just want to clarify, you're here testifying today on behalf of Champaign Wind, which is a subsidiary of EverPower. Did you testify on behalf of EverPower in an earlier proceeding before the Ohio Power Siting Board?

A. Yes, I did, three years ago.

Q. That was the sister project to Champaign Wind, Buckeye Wind?

A. I refer to it as Buckeye I, yes.

Q. So you understand this project then to be a second phase of the Buckeye Wind project?

A. Yes.

Q. And have you testified before for other turbine installation developers other than EverPower?

A. Yes, I have, once additionally, and that was in Ontario.

Q. Okay.

A. Kent Farm project.

Q. And how long ago was that?

A. A year and a half to two years ago.

Q. Okay. I want to direct your attention to your direct testimony, question 11 on page 7. You note that the validity of epidemiological studies depends on several factors, and that you have to

avoid biases, such as selective participation of certain subsets of individuals.

Could you explain to me more what you mean by "selection bias"?

A. Certainly. Anytime we conduct an epidemiological study, we identify a target population that we want to study, but we inevitably have to draw a sample from that study because we can't study the entire population. When we draw that sample, we want it to be a representative sample. We can then infer something from that study back to that population.

If we only get, say, the first wave of volunteers for study, there might be characteristics different from the population that they come from, so that would represent a selection bias. They don't represent the population we targeted from which they came to participate in the study.

Q. Thank you. You don't just testify in regard to wind turbines. You testify -- let me back up. You don't just testify with regard to adverse health effects of, in this particular case, noise or infrasound, you also testify as to epidemiological studies showing adverse health effects for other industries; is that correct?

A. If I understood your question, you're not referring to this proceeding. This proceeding I'm talking about epidemiology and epidemiological science as it pertains to wind turbines.

Q. Okay.

A. I mean, if your question is, am I an epidemiologist that provides scientific testimony in other matters, the answer is yes.

Q. Okay. And have those matters included things like chemical exposure?

A. Absolutely.

Q. Okay. Do you recall performing a study on the link between polyvinyl chloride and brain cancer?

MR. SETTINERRI: I'm going to object, relevancy.

MS. PARCELS: This will be a foundation as to the witness' credibility for other studies.

ALJ CHILES: I'll allow brief questioning on the topic.

Q. Dr. Mundt, do you recall performing a study on the link between vinyl chloride and brain cancer that you performed for the American Chemistry Council?

A. Yes, but I need to clarify. I was the

principal investigator of the largest and longest followed group of vinyl chloride workers in the world. The purpose of that study was to evaluate all health effects, including brain cancer, which would be one of 100 different health effects evaluated in that study.

Q. Okay. Do you recall a lawsuit being filed in relation to some of the brain cancer victims and their survivors against the -- well, a chemical plant operated by Rohm and Haas?

MR. SETTINERRI: I have to object again on the basis of relevancy. Now we are going into details of lawsuits that have no bearing on this.

MS. PARCELS: I was going to ask him if he testified in that lawsuit.

MR. SETTINERRI: I'm sorry, I still object.

ALJ CHILES: You can ask that question, but I think that question the way you asked is beyond the scope, so if you want to refine that question.

MS. PARCELS: Okay.

Q. (By Ms Parcels) Dr. Mundt, you testified that you did perform -- you were an investigator in this study related to the link between vinyl chloride, and the American Chemistry Council was the

entity that commissioned this study. Do you recall testifying in a lawsuit that was filed in relation to the plaintiffs that were brain cancer -- that developed brain cancer against the chemical plant operator, Rohm and Haas? Did you testify in relation to any litigation involved in that study?

A. I don't think I testified in any tort litigation involving vinyl chloride, with the exception of -- and perhaps what you're referring to -- and I don't recall the names of the parties in the case -- I was called as a fact witness because I had conducted the study, and before I was asked two or three questions, I was excused because I believe that the attorneys that brought me in began to ask me professional questions or expert questions.

So I think that might be what you are referring to, but I don't think I had a chance to testify for the technical reason that is beyond me. I'm not a lawyer. As I said, I had been called as a fact witness to talk about the study that I performed.

Q. Do you believe you are being called as a fact witness today or an expert witness today?

A. As an expert witness.

Q. Okay. In relation to that particular

study -- and you note that part of the difficulty with determining whether an epidemiological study is valid is selection bias -- were you made aware of certain brain cancer studies that were not included in your study?

MR. SETTINERRI: At this time, your Honors, I have to object again to the relevancy of this line of questioning.

ALJ CHILES: I'm going to sustain the objection at this point.

Q. Dr. Mundt, when you refer to selection bias, and you also note in your direct testimony that particular incidents are not -- or case reports are not valid epidemiological studies. If self-reporting is not an acceptable method from an epidemiological standpoint, how then can there be any reliability if there's no self-reporting of patients who experience things, such as what they call wind turbine noise effects?

A. In epidemiology, reliability means something specific, and I take it that's not what you're referring to. Reliability is whether a measurement that you use, like a yardstick, gives you the same measurement no matter how you use it or under which conditions.

If it was a material that expanded and contracted with temperature, it wouldn't be a reliable measure. So when you ask about the reliability of symptom reporting, it is one of the toughest areas scientifically to get at because nobody knows what our symptoms are except ourselves, so self-reporting symptoms, things we feel that can't be measured objectively by any external means, we have no choice but to ask the participants. So for that narrow question, symptom reporting must rely on individual self-report.

There are conditions under which that information can be better or worse. If somebody truly thinks about their symptoms, especially right now as you sit, they're going to be pretty accurate, unless they have some reason not to report those symptoms.

A young athlete who wants to get out on the field but has a searing pain in his ankle may not report his symptoms accurately to his coach. My symptoms as I sit here today, I might be able to reflect accurately to you, but one week from now or one month from now, I may have no recall what symptoms I was experiencing at a particular point in time.

So you have to be, like anything else, very careful what your measure is and not to presume that because somebody reported a symptom that it was a reliable measure, in your terms, at the point in time that it was given or at the time that it's being used for an epidemiological study.

Q. Okay. Well, related to that then, would you agree that there are some medical diagnoses that can be confirmed and established, regardless whether a symptom is present or not, such as looking at a tumor on a medical imaging readout to confirm the presence of a tumor, regardless whether a person reports symptoms or not?

A. Absolutely. There are any number of things that can be measured clinically, medically, that we, as patients, might have no clue about, our blood pressure, our cholesterol levels, our prostate-specific antigen levels, all things that can be measured objectively without having to offer subjective symptom reporting.

Q. If there are individuals that present medical diagnoses that are concrete and objective, such as, say, a brain tumor, would those then be included in an epidemiological study if they fit other parameters for the study?

A. Oh, absolutely. In fact, you want to have the most objective indicator of health effects in any epidemiologic study, and those that can be measured objectively without subjective symptom reporting are far preferable and lead to greater validity in the study results, and, as you correctly pointed out, given that the context of the study is properly done.

A good diagnosis in isolation doesn't mean much, but if you have good thorough follow-up of all the members of a cohort, like the vinyl chloride cohort, all those people became part of the study while they were employed. They have no idea how they would 30, 40 years later die. A study like that has very low susceptibility to selection bias.

Q. Okay. So you referred back to the vinyl chloride study and the link between brain cancer for the people that were employed at that plant. Are you aware then that there has been criticism of that study for missing some two dozen cases of fatal brain cancer among those employees?

A. I'm aware of those accusations, and there's crystal-clear evidence that is false.

Q. Again, we spoke briefly about the litigation, but has that been established through any

sort of court testimony, or does that remain in litigation?

A. I'm unaware of any litigation that it's been established scientifically. The follow-up of individuals in that cohort used the National Center for Health Statistics, the National Death Index, which identifies every single death that occurred in the country since 1979. All deaths are included, and there's no way to modify the results of that. They come in as the National Center for Health Statistics, and all the states' vital statistics bureaus and all the coding the death certificates reveal.

Q. Is it possible that a death certificate can be erroneous?

A. There is an error rate associated with the death certification, yes.

MS. PARCELS: I have no further questions for this witness. Thank you.

ALJ TAUBER: Thank you.

Ms. Napier.

MS. NAPIER: Thank you.

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CROSS-EXAMINATION

By Ms. Napier:

Q. Dr. Mundt, my name is Jane Napier. I represent the county and townships within the footprint of this wind project. I just have a few questions about epidemiology in general. In reading your testimony, I wanted to ask you a couple of questions. It appeared to me in your testimony that --

A. Yes.

Q. -- I hope this is a fair statement -- that epidemiology alone can't prove a causal association does not exist, in general. Is that a fair statement?

A. I'm sorry, are you quoting my testimony?

Q. No. No, I'm sorry. I'm quoting my own notes here.

A. Do you mind repeating that statement?

Q. Epidemiology alone cannot prove that a causal association does not exist, in general.

A. Prove that it does not exist?

Q. Yes.

A. That's a good question. It comes to the heart of the scientific method. The scientific method is essentially coming to an informed conclusion or judgment by disproving evidence. You

set up hypotheses. You knock them down. It may resonate with, I think, even junior high science. My kids tell me this is what they learned.

You set up an experiment. You have a hypothesis, and you do the experiment to see whether you can reject that hypothesis. So the basic scientific method we all use, and in epidemiology as well, is to set up the hypothesis, wind turbines cause health problems, go and study it, and say, is there sufficient evidence of reasonable quality and weight that says we can reject that, and if we can't, we now have affirmative evidence of it. As we reject these hypotheses, technically we can't ever prove the negative.

The last time I sat there three years ago I used the example, and it's a classic one from Karl Popper, the philosopher on causation, you can claim because you've seen millions of white swans that all swans are white, but as soon as you see one black one, that whole conclusion, albeit not a causal one, per se, goes out the window.

Similarly, once you rejected a hypothesis, you have positive evidence, but you can't prove that the -- you can't prove the negative through that process.

Q. Okay. And I'm sorry, in reading your material that question came to me. So I also thought that epidemiology does not give a cause for an individual's health issue. Is that a fair statement?

A. It is, indeed, largely true. There are probably examples where you don't even need epidemiology. Someone is shot in the head. They're dead. You can come to probably an accurate causal conclusion in that situation.

But with most disease symptoms, chronic diseases, there are so many different potential causes that for an individual, you can't say which one caused that individual's disease. One might quickly conclude that someone who is a heavy smoker and died of lung cancer is an example of that smoking history causing that lung cancer.

While that's probably the case and a good judgment call, it could be that that person would have developed lung cancer never having smoked because there are lung cancers, they're rare, among never-smokers.

So let's say that not only can epidemiology not differentiate among possible causes, nor can anyone. There's not a signature for lung cancer that says this one is due to smoking; this one

is due to some other cause. So what we do epidemiologically is figure out with lung cancer and smoking, there's the high probability that people who are heavy smokers had that disease caused by their smoking; therefore, an individual who is a heavy smoker we would conclude probably was caused by their smoking. But we can't prove it epidemiologically or by any other means.

Q. You can't prove the negative and you can't prove for certain that something does cause it, something through epidemiology, but epidemiology is kind of everything else in the middle? Would that --

A. Not necessarily. Think about you go to the doctor and you have high cholesterol. The doctor is going to give you some statin drug because the doctor knows that that will work on you and that will solve your lipid problem, not at all, because the doctor knows from the epidemiologic literature that when this treatment is given, there's broad effectiveness, and, therefore, he or she is hoping it will do the same for you.

So though epidemiology can't go to the limits as far as we want for decision-making, it informs many, many decisions that are made regarding health and medicine and treatment.

Q. And I see in the last paragraph of your answer to questioning, you indicated that no single study, regardless of design, is likely capable of demonstrating causation. Does that mean that epidemiology relies on a number of studies, maybe the more studies can, you know, give a better indication of causation? Is that a fair statement?

A. That's absolutely fair. We'd like to see several well-conducted studies that have similar findings and are conducted using different methods and different settings. It builds, say, our confidence in a causal judgment.

Q. And over time does it usually, epidemiology, does that help as time passes by to discover kind of health effects and causation for studies?

A. If I understand your question, over time the accumulation of evidence sometimes highlights things that hadn't been seen previously, but it also can clarify things that were thought to be a causal relationship earlier.

We have examples with, say, ulcer, what causes ulcer. We now know it's H. pylori bacterium and it's easily treated in most people. So science is open-minded. Science has no agenda. It

accumulates evidence and different things can happen. So I think, to answer your question, with time more evidence accumulates sometimes for a conclusion, and sometimes more evidence accumulates against a conclusion, but the science, I hate to say this the cliche way, is what it is.

Q. So do you find over time, say cancer that more information comes out for a scientist to make a hypothesis that more accurately reflects the health outcomes that are being diagnosed?

A. I'm not sure that's different from what you asked previously.

Q. Okay.

A. Sounds like with more evidence, more things might be uncovered. I think that's common sense.

Q. I also saw in looking at epidemiology, that you utilize a collection of statistical tools. Would you agree with that?

A. Yes.

Q. So, in essence, I think, as Ms. Parcels mentioned, you're not looking at self-reporting diagnoses to determine a cause; is that correct?

A. I'm sorry, I don't understand.

Q. For studies, you're not looking at

self-reported individual diagnoses to determine a cause.

A. Typically not. But let's say, hypothetically, in a situation where you are studying a headache, that is the only way you would get that information.

Q. Okay. So I know your testimony you talked about annoyance, that there was a report of annoyance in some of these studies that would be self-reporting. Is that one of the things you are talking about, the way you would get that information?

A. That's correct.

Q. So, in essence, to be an epidemiologist, you don't need to be an MD, a medical doctor; is that a fair statement?

A. Absolutely. I'm not. I have a Master's degree and PhD in epidemiology.

Q. Are you a psychiatrist or a psychologist?

A. No.

Q. So mental health issues would not be something that you could diagnose?

A. I can't diagnose physical entities either, so, yes, that's correct.

Q. And you had stated, I believe on page 36

of your testimony, that "Annoyance with noise or the visual impact of wind turbines does not constitute disease or health effect." It's the second-to-last sentence, about a third of the way down the page.

A. Yes, that's what I state.

Q. What is the basis of that statement?

A. There is a catalog of health conditions that are globally standardized. It's called the International Classification of Diseases, ICD. We are in our tenth version of this now over many decades, and there is no reference directly or indirectly to annoyance under any disease category in the entire -- I don't know how many hundreds of pages of lists of health entities, disease entities. That's one way.

I would say nearly, without exception, every other entity, health-related entity, that I have studied has a code, whether it's physical or mental health.

Q. And I apologize if this is beyond your expertise, but wouldn't annoyance deal with stress? Wouldn't it be a symptom of, perhaps, stress?

A. Might be. I have not studied --

Q. Do you feel you're able to answer that?

A. That's right, I have not studied that. I

can't address that. I have a lay perspective of what annoyance is, since all people experience annoyance, but I can't say here I'm an expert on what annoyance is, what its relationship might be with other measured or reported conditions.

Q. I'm not sure if it was for the purpose of your testimony today or that you have done it in your own employment, but have you done a study yourself on the effects of industrial wind turbines on persons that live nearby?

A. No, I have not.

MS. NAPIER: Thank you. I have no further questions.

ALJ CHILES: Thank you.

Mr. Van Kley.

MR. VAN KLEY: Thank you, your Honor.

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CROSS-EXAMINATION

By Mr. Van Kley:

Q. Good afternoon, Dr. Mundt.

A. Good afternoon.

Q. Do you have any training in acoustics?

A. No, sir.

Q. How many wind farms, approximately, have you visited?

A. Two.

Q. And can you tell me which ones those are?

A. Yes. One is a very large spread of wind turbines in Southern California near Palm Springs.

MS. NAPIER: I'm sorry, because you were closing the door, I couldn't here the answer.

THE WITNESS: I will repeat it. One was a very large installation in Southern California. I think it was in or near Palm Springs. The other one was in Ontario near the Kent project that I have referred to earlier while I was in Ontario.

Q. Have you ever interviewed any people that -- have you ever interviewed anybody in order to determine whether they were suffering ill effects from turbines?

A. No. I have had no reason to.

Q. Do you know whether anybody else has ever performed an epidemiology study on behalf of the wind industry or on behalf of any wind developers to determine whether there is an association between wind turbines and ill health effects?

A. I'm not familiar offhand with the sponsors of studies that have been published, but I don't recall that there are specifically on wind turbines manufacturers or developers.

Q. Other than reviewing literature that may be available to you, have you personally performed any type of study, whether it is epidemiological or otherwise, to determine whether wind turbines cause health problems?

A. No, I have not done any primary research on this topic.

Q. Why don't you turn to page 22 of your testimony, please. Page 22 of your testimony you're discussing the Nissenbaum study, correct?

A. Yes.

Q. All right. And that's one of the studies that you added the reference for in the reference section of your direct testimony at the beginning of your appearance today.

A. That's correct.

Q. While we're at it, why don't you pull out a copy of the report on that study, which I believe you should find at your table attached to Dr. Punch's testimony as Exhibit 23B.

A. I assume it's among these.

Q. No. It should have been on your desk there. I thought that it was pulled out for you. If you don't have it, I have another copy here.

A. I have my own copy here.

ALJ TAUBER: Mr. Van Kley, this is in Dr. Punch's testimony?

MR. VAN KLEY: Yes, Exhibit 23B in Dr. Punch's testimony.

MR. SETTINERRI: Dr. Mundt, there is a copy of Dr. Punch's testimony in front of you.

THE WITNESS: I see it's attached. All right.

Q. (By Mr. Van Kley) All right. Do you have UNU Exhibit 23B in front of you?

A. Yes.

Q. All right. Now, the purpose of Dr. Nissenbaum's study was to compare sleep and general health outcomes between participants living close to industrial wind turbines and those living further away from them, correct?

A. Yes.

Q. And he did that by comparing the rates of disease for the persons living close to wind turbines with those living further away from the wind turbines; is that right?

A. I wouldn't say that he did that. That was his hypothesis. The problem I have with this, he didn't engage in the methodology that would allow him to validly address that hypothesis.

Q. My question --

A. What he did do was collect responses from volunteers from different areas, and he did compare them statistically.

Q. Let's just look at a few things that you said in your direct testimony about Dr. Nissenbaum's study, starting with a couple of points on page 22 of your testimony. Looking under the heading on page 22 of Definition of Exposure, you stated there that "Residential distance from the nearest wind turbine was the main study exposure variable. No actual measurements of any exposure at participants' homes occurred, although some sound measurements at each location are provided in Table 1."

Did I read that correctly?

A. Yes, sir.

Q. All right. Would you go to page 238 of Exhibit 23B, which is the Nissenbaum paper. And I'd like to direct you to the second paragraph, the left column of that page. Do you see the paragraph that starts with the word "Simultaneous"?

A. Yes.

Q. And tell me whether I'm reading this correctly. "Simultaneous collection of sound levels during data collection at the participants'

residences was not possible, but measured IWT sound levels at various distances, at both sites, were obtained from publically available sources. At the Mars Hill site, a four quarter study was conducted and data from all four seasons were reported by power outputs at several key measurement points. The measurement points were located on or near residential parcels. The predicted and measured levels at full power were derived from figures in the Sound Level Study, Compilation of Ambient and Quarterly Operations Sound Testing, and the Maine Department of Environmental Protection Order No. L-21635-26-A-N. Measured noise levels versus distance at Vinalhaven were taken over a single day in February 2010, with the turbines operating at less than full power in moderate-to-variable northwest winds aloft (R and R, personal communication, 2011). Table 1 shows the estimated and measured noise levels at locations of varying distances and directions from the turbines at Mars Hill and Vinalhaven."

Did I read that correctly?

A. Yes.

Q. And you see Table 1 in the right column of that page, right?

A. Yes.

Q. And Table 1 is labeled "Measured and predicted noise levels at Mars Hill and Vinalhaven"?

A. Yes.

Q. And you see the noise levels listed in that table?

A. Yes.

Q. Okay. So it is true, is it not, that Dr. Nissenbaum did have noise levels that he used in his study with respect to determining what noise levels were being experienced by the subjects of his study?

A. Well, what you read is his fancy way of saying what I summarized in a sentence or two in my report, which refers to Table 1, that he applies to the participants in his study in what we call an ecologic way. We don't know what the measurement was, as he said, in the residences because it was not possible. So we don't know what the exposure levels would have been in any of the residences. It's assumed to be or assumed or modeled, let's say, based on these other measures derived as described in the paragraph you read into the record.

Q. Well, Table 1 is labeled "Measured and predicted noise levels at Mars Hill and Vinalhaven," correct?

A. That's what the table says.

Q. Some of the noise information was actually measured, according to this paragraph; isn't that right?

A. Yes. You read the paragraph how they were measured and when they got the measurements. They were not from the residences of the participants.

Q. Well, what it says in the first sentence is that "Simultaneous collection of sound levels during data collection at the participants' residences was not possible." Isn't that what it says?

A. It says that. But I am also unaware that there were any sound levels collected in any residence, never mind simultaneous with, I presume, the questionnaire that was a survey that was administered.

Q. Look at the second sentence where it says, "At the Mars Hill site, a four quarter study was conducted and data from all four seasons were reported by power outputs at several key measurement points." Doesn't that refer to actual measurements?

A. Yes; but it did not refer to anybody's residence or any participants's residence.

Q. So are you saying then that in order for this study to be valid, that Dr. Nissenbaum had to measure the specific noise from the turbines at everybody's residence?

A. It would have been preferred. I think that the farther you get away from a specific measurement or a specific dose, if you had an experiment with animals, you would want to know what dose they got individually. It was measured. It's precise.

If you just send mice into a feeding room with tainted feed, you have no clue which ate more, which ate less, what the exposure conditions were, so how can you then draw a causal inference on that basis. You have no idea what the exposures were to the individuals. So I can't say that it's invalid, but it's certainly subject to much more imprecision and bias by not having measurements on the individuals who were participating in the study.

Q. So are you saying then that Dr. Nissenbaum should have measured the noise levels from the turbines at the exact time he was interviewing the people?

A. It would be convenient, wouldn't it, to do it at the same or some other time so that there

could be a closer correlation between what might be taking place at somebody's residence if they're even there? Some people won't be in a residence for parts of day or entire days at a time.

So, yes, we'd like to know what people were actually exposed to and relate that to the kinds of health effects, preferably, again, objectively measured, than simply relying on things that are subjectively and voluntarily reported.

Q. So do you believe that Dr. Nissenbaum's study was evaluating the health effects that were occurring at the exact moment that he was interviewing these people, or was he determining what health effects had occurred over a period of time?

A. Frankly, I can't tell you what his study found because the methodology is so weak.

Q. Isn't it true that Dr. Nissenbaum's researchers were interviewing the subjects to determine what health impacts they had been experiencing as opposed to what they happened to be experiencing at the very time they were being interviewed?

A. Were they? It's not even clear that they were interviewed. I understood that the questionnaire was given out and that there was a

nurse nearby to help out, for some reason, whether that was to assist them in answering it or to clarify questions. Good survey research will have trained administrators or monitors of the participants conducting the survey, and they will know what they're allowed and not allowed to say to the participants so that they don't bias the answers that are provided.

Q. Well, it's true, isn't it, that questionnaires were sent out to be filled out by the subjects and that some others of the subjects were interviewed?

A. It's suggested. It would be nice to have had that documented, yes.

Q. Well, let me point to something. Would you look at page 237 of Dr. Nissenbaum's paper? Under Questionnaire Development, would you look at the last sentence where it says, "The questionnaire is available on request."

A. Yes.

Q. Did you ask for a questionnaire before you did the testimony?

A. No; because I already had it.

Q. You already had it?

A. Yes. If you're --

Q. So it was clear --

MR. SETTINERRI: I'm sorry, the witness was not done with his answer.

A. If you are referring to what I have, I don't know what Dr. Nissenbaum would have sent me had I requested it. But my understanding is that I had a original copy of the questionnaire that he presented in another matter, and it was entitled "Adverse health effects associated with industrial wind turbine installations questionnaire."

Q. That was something that you obtained in another matter?

A. Yes.

Q. So you're not sure that's the questionnaire that was sent out for purposes of developing this paper?

A. It was provided in that matter under that -- with that understanding. Maybe to be clear, I don't know whether he would send it to me today with that title on it, given the criticisms I've raised because of the titling of the questionnaire, advertising what it was about, "Adverse health effects associated with wind turbines."

Q. So you think Dr. Nissenbaum would misrepresent to you what the questionnaire was?

A. I didn't say that. I can't say what he would have sent me because I didn't ask him for a current version of his questionnaire.

Q. Based on the questionnaire that you saw, were the participants asked to describe the health symptoms they were experiencing at the exact time they were filling out the questionnaire, or were they asked to provide information about the health symptoms they had been experiencing over a longer period of time?

A. I believe there are questions -- I don't recall. I haven't looked at the questions inside the questionnaire for some time, but I recall that there were some questions that asked them to think back to some time before the wind turbines were installed. Those, however, don't get reported in this paper. They would have been a useful basis for seeing whether there were baseline differences between these communities even before these wind turbines came on the scene.

Q. If the information was obtained by questionnaire, and the questionnaire was mailed in to the researchers, how could the researchers know when to perform the noise measurements outside of the homes or in the homes of people filling

questionnaires out?

A. I don't understand your question. If I might try to interpret it, or would you like to rephrase it?

MR. SETTINERRI: I will object to the form of the question. Are we referring to a hypothetical, or are you referring back to Nissenbaum's study?

MR. VAN KLEY: I was referring to Dr. Nissenbaum's study.

Q. Earlier you stated it would have been preferable to do the noise measurements at the time an interview was being done of the subjects of the survey. What I'm asking you now, with respect to subjects of the survey that were filling out questionnaires, how do you expect that Nissenbaum's researchers would know when to do the noise survey outside the homes or inside their homes?

A. Well, sounds like a good question for him. You read this very sentence. "Simultaneous collection of sound levels during data collection at the participants' residences was not possible, but measured IWT sound levels at various distances, at both sites, were obtained from publically available sources."

Sounds like he is giving the reason why he didn't do that and that it was not possible, but he doesn't say why it wasn't possible. Sounds like he agreed or seems from this statement that he found it worthwhile to explain why he didn't do it that way.

Q. Well, I know you just stated earlier in your testimony that you are not an acoustics expert, so maybe you won't know the answer to the question, but I'll ask you anyway just in case you do. Isn't it true that noise levels from wind turbines vary from time to time?

A. Yes.

Q. And if that is true, wouldn't it be more accurate to obtain a measurement of noise over a longer period of time to measure the exposure of the subjects of the survey rather than just one snapshot in time from measuring the noise level at the time the questionnaire is being filled out?

A. That's a fair question. It depends, though, on the research question you're trying to answer. If you are trying to answer a question that has to do with long-term exposures then an instantaneous measure is probably not a great surrogate or indicator of it.

If you are asking persons to report on their prevalent symptoms at that moment, you probably should know what they're subject to, what stimuli they're subject to, not limited to the turbine noises, other things in their surroundings.

Q. Do you see any indication in this paper that Dr. Nissenbaum's researchers asked the subjects of the survey to report the symptoms they were feeling at that exact moment they filled out the questionnaires?

A. I don't remember that specific language.

Q. Looking at the bottom of page 22 of your testimony again, the last sentence on that page states, "Time and intensity of exposure would be important aspects of defining exposure." Do you see that?

A. Yes.

Q. So that goes back to the statement you just made concerning whether or not the noise levels over a prolonged period of time are important for that study, right?

A. No. For that research question, the questions have to do with -- his questionnaire has dozens of symptoms and outcomes and perceptions, and for some, short-term exposure might be more relevant,

and for others, long term might be relevant.

My statement here, too, on time and intensity goes on to say it also should factor in whether people were actually at home. If they weren't home, it doesn't matter if those exposures are measured in their homes. They should be measured where the people are.

Q. Go to page 24 of your testimony. Under Comparison Population on page 24 of your testimony, you state, "Households in a 'similar socioeconomic area 3 to 7 kilograms away from IWTs at each site' were randomly sampled for recruitment into the study."

And then later in that paragraph you have stated, "However, the paper states that for the comparison group: 'Households were approached sequentially until a similar number of participants were enrolled.' This clearly is not a valid random recruitment approach, and underscores the lack of technical understanding of the important difference."

Going back to page 238 of the Nissenbaum study, which has been marked as UNU Exhibit 23B, I'd like to direct your attention to the first paragraph in the left column of that page. See the sentence that starts about seven lines from the bottom of that

paragraph with the words "A random sample"?

A. Yes.

Q. It says, "A random sample of households in similar socioeconomic areas, 3 to 7 km away from IWTs at each site, were chosen to participate in the study to allow for comparison (far group). The households were approached sequentially until a similar number of participants were enrolled."

Did I read that correctly?

A. Yes.

Q. And that is the language from the Nissenbaum study to which you're referring on page 24 of your direct testimony, correct?

A. Yes.

Q. Okay. Now, I want to make sure that I understand what you're saying here. Are you saying that Dr. Nissenbaum did not take a random sample but instead approached the households in the control group sequentially, or are you saying that he took a random sample of households, and then in that random sample, approached the households sequentially?

A. It's not clear, is what I'm saying. A random sample -- it appears the random sample becomes then the source of the participating sample and that those were obtained, as he says, by sequentially

going, I guess, house to house.

Let me just raise the possibility -- well, I'm saying it's not clear from this. It's not that he did or didn't do this, but if you draw a random sample and you've identified all the houses in that area and then you start interviewing people from one end of a random sample, people you get in the study aren't random, although they're from a random sample or a subset of that.

You start knocking on doors, you are going to get households where people are actually home, that's, again, not random. Although the sampling frame was random, the actual selection of participants in the population are not random. It all goes back to whether it's a representative sample or not of the population you want to target, you want to evaluate.

Q. Based on the information here in the study, you can't tell whether, in your opinion, it met the qualifications for random selection that you would have liked to have seen; is that right?

A. Yes, that's correct. I put that among the more minor problems here.

Q. Go to page 25 of your testimony, please. Under Participation Bias, you have made a point that

the study participants knew that Dr. Nissenbaum was studying the effects of wind turbine noise. Is that accurate?

A. As he calls them, adverse health effects associated with wind turbines.

Q. All right. So the point you're making is that there could have been bias in the results because the subjects of the study knew that he was looking for adverse health effects from wind turbines. Is that a fair statement?

A. That's the concern.

Q. Okay. And Dr. Nissenbaum addressed that concern in his study, didn't he?

A. Not that I'm aware of in a satisfactory way.

Q. All right. Let's just take a look at page 241 of Dr. Nissenbaum's study. Under Potential Biases on that page, tell me if I'm reading this correctly. "Reporting and selection biases in this study, if they existed may have underestimated the strength of the association between distance to IWTs and health outcomes. Both Mars Hill and Vinalhaven residents gain financially from the wind projects, either through reduced electricity costs and/or increased tax revenues. The fear of reducing property

values was also cited as a reason for downplaying the adverse health effects. Conversely, the possibility of legal action could result in symptoms being overstated. It was clear to the respondents that the questionnaire was directed at investigating adverse health effects potentially associated with IWT noise and no distractor questions were included. Nevertheless, given the large" -- distances -- "in reported adverse health effects between participants living within 1400 m and those living beyond 3300 m of an IWT, we do not believe that bias alone could have resulted in the differences demonstrated between the groups. In addition, the finding of strong dose-response relationships with log-distance, together with extensive subanalyses using survey questions more and less likely to be influenced by bias demonstrating similar results, further support the existence of causative associations."

Then looking down towards the middle of the next paragraph, do you see the sentence that starts with words "Most residents"? Where it says, "Most residents welcomed the installation of IWTs for their proposed financial benefits and their attitudes only changed once they began to operate and the noise and health effects became apparent."

Did I read all that correctly?

A. With the exception of one word in the first paragraph you have said "distances" when it read "differences."

Q. Very good, I appreciate that. So when Dr. Nissenbaum wrote his paper, he was aware of the potential bias that could have resulted from people knowing that he was looking for adverse health effects from turbines, right?

A. When he wrote the paper or when he conducted the study?

Q. When he wrote the paper.

A. I'm not sure he was aware when he conducted the study, yes.

Q. I asked when he wrote the paper.

A. When he wrote the paper, he seems to be aware that there -- and there has been criticisms of this before this -- that it was vulnerable to a number of biases.

Q. And you may not agree with his response to that issue, but he does address it in his paper, doesn't he?

A. It describes his belief, which is neither scientific nor objective, nor does he make any effort to compare the people that he got to participate in

his study with the ones who refused or the ones he couldn't reach upon whatever effort they made to recruit them. These are standard approaches to defining -- I mean, you see it in some of these other papers -- standard ways of approaching objectively and honestly what happened in your study, rather than having to revert to argumentative language or belief.

Q. It's not uncommon for even two epidemiologists to disagree over whether a study has been performed correctly, isn't that right?

A. There are many situations where epidemiologists legitimately disagree on some aspect or another of a study. There are other aspects which I'd be surprised there would be strong disagreement because they reflect basic principles and concepts in the field that anyone who has a degree in epidemiology should know and should be aware of and should be cautious of in doing their own work.

Q. In approximately how many cases have you testified about epidemiology principles?

A. I would say every case that I testify in is about epidemiology principles because that seems to be the root of the problem, in most cases.

Q. In how many cases approximately have you testified?

A. I've probably testified in a dozen cases -- maybe not so many, eight to twelve.

Q. And in how many of those cases did an epidemiologist testify who disagreed with your conclusions?

A. Many. Let's say there are many epidemiologists who are willing to testify contrary to some of the basic concepts and methods that are common to graduate degree training and textbooks.

Q. Have you ever found an epidemiological study, other than the ones that you've performed yourself, that you believe have been performed in perfect compliance with all of the epidemiological principles you've laid out in your testimony?

A. Sounds a little bit like a trick question. I wouldn't exclude my own studies from the category of all epidemiologic studies where the goal is not to conduct a perfect study. It's impossible.

Rather, the goal is to thoroughly evaluate the potential for bias and do what you can to reduce or eliminate it. And so I would say the majority of studies published in reputable journals, like the American Journal of Epidemiology, Annals of Epidemiology, meet those standards, and this might be a rare exception, but it's -- I would go to bat on

any of those journals and any of the work in those holding up to, at least, minimal standards that I've been describing here today.

Q. And with regard to those studies, were there other epidemiological -- other epidemiologists that believed those studies were not performed adequately?

A. Sure. There's always an opportunity in these journals to comment through letters to the editor pointing out where there may have been an error in methodology on interpretation, and it gives the scientific community the opportunity to weigh in on those.

Q. Approximately how many epidemiology studies have you personally performed?

A. I've probably participated in roughly 100 studies, half of which are published and reflected in the papers in my resume.

Q. And in how many of those studies were you evaluating products or practices that were being sold or conducted by the clients you were working for?

A. I'm sorry, I cannot follow your language.

Q. Do you want me to rephrase?

A. Yes.

Q. I'll start over again. In how many of

those epidemiology studies did you evaluate the products or services or practices of the very same people you were working for when you did the studies?

A. I see. You're asking if my work is funded by people and entities interested in the health impacts of their products or workplaces?

Q. Exactly.

A. I would say much of my work, especially as an occupational epidemiologist, is of specific workplaces and processes and entire industries, for that matter, where the companies recognize their obligations to understand the risks associated with products used in those plants, and, therefore, commission research to be done and published in the open scientific literature to help them understand and help the regulatory community understand what those risks are.

Q. Have you ever done an epidemiological study for the government?

A. Well, yes. I've done a number of studies for the German government. I don't know if they count in your definition of "government." I've been funded by the US government to do research, as others have sponsored research. I've had government sponsorship, yes.

Q. In those cases where you did an epidemiological study on behalf of the clients whose practices or products you were evaluating, what percentage of those would you say resulted in findings that those practices or products did cause health problems?

A. I need to finish my earlier answer. I apologize for going back. I forgot about an entire raft of research we do on behalf of the military. We do a lot of work, years and years with the U.S. Army, looking at risk factors for injury for soldiers because it's a hugely expensive and problematic health problem.

We did a big study of the civilian workforce at a big air force base in Texas where there was a concern about Lou Gehrig's disease, or ALS, and we have done a lot of work with the safety of vaccinations in the army, anthrax specifically, where there were allegations of anthrax vaccinations also causing problems. It was just unknown, and there were a half million people in the army that had been vaccinated so we did studies for them.

The second question --

Q. I will reask the question in a moment, but let me just follow up on the answer you have just

given me. In what percent of cases, what percent of the studies in which you were personally involved, would you say have been performed on behalf of the very people whose products or practices are being evaluated versus other people.

A. Half, very roughly. I have no idea, but it seems to be a mix of those where there's a product involved. Many of them, like the ones that have been partly funded by the German government, included whole industries. Like the porcelain industries, the one we were just wrapping up several publications on with 18,000 porcelain workers, there's products involved. Is the government interested in those products? I suppose they get tax money from the success of those businesses, so in some ways you might say all of them have some interest in it.

Do they have an interest in the health of their employees and knowing the cost implications of that? Yes, of course. The same thing with the German rubber industry with 80,000 workers. So I would say most of the sponsors have a vested interest of some sort in knowing the health risks to those populations.

I would say of those, I can't recall a study where it was absolutely negative, where we

didn't find some health effect. The example for the air force base in Texas, the purposes was to look at ALS, Lou Gehrig's disease, we actually found an excess of breast cancer among Hispanic employees there that led to a big education intervention program.

I would say almost all studies find some health problems. Now, it had nothing to do with their exposure to fuels at this site. It had to do with their increasingly Texan behaviors and risk factors. It had to do with being overweight and delayed childbirth. Those are the primary risk factors for breast cancer. I can't honestly remember a study that was purely negative where some health effect was not identified and reported.

Q. Isn't it true that the results of an epidemiology study on the health effects of something can be changed by how the study is conducted?

A. Well, much of what we have been talking about here is when you got a bad methodology, you get bad results, and I would guess if you improved the methodology, you would get different results.

Q. And, in fact, it works both ways, doesn't it? By using bad methodology, you can skew the results of the study to either show that there is a

health effect or there is not a health effect linked to the thing you're studying, right?

A. If you are unethical, sure.

Q. Okay. Have you ever been accused of such a practice?

A. Not that I'm aware of.

MR. VAN KLEY: Your Honor, I'd like to approach the witness and also mark two exhibits to provide to the witness.

ALJ CHILES: You may.

MR. VAN KLEY: The first document, your Honors, is labeled UNU Exhibit 39. It is an article from the Washington Post entitled "Chromium Evidence Buried, Report Says."

(EXHIBIT MARKED FOR IDENTIFICATION.)

MR. VAN KLEY: Your Honors, the second document is labeled Exhibit 40, and it is entitled on the first page "Selected science: An industry campaign to undermine an OSHA hexavalent chromium standard."

ALJ CHILES: So marked.

(EXHIBIT MARKED FOR IDENTIFICATION.)

Q. Dr. Mundt, with respect to UNU Exhibit 39, you have seen the document before today, haven't you?

A. I probably saw it back in '06, yes.

Q. Well, in fact, you testified about this document in late 2011 in a trial in Nevada, isn't that correct?

A. Well, I was asked some very one-sided questions in that trial. I have to say that I did testify about this at an EPA administrative trial last December where I was actually asked for my full opinion on this. I would refer you to that testimony where I was actually given a chance to correct the questions that were asked and, in fact, testified for about an hour responding to questions from the EPA judge.

Q. Well, let's just take a look at this article, and I will give you an opportunity to explain yourself here, too.

A. I appreciate that. That's rare.

Q. Looking at the first page of that document, the first paragraph states, "Scientists working for the chromium industry withheld data about the metal's health risks while the industry campaigned to block strict new limits on the cancer-causing chemical, according to a scientific journal report published yesterday."

Do you see that?

A. Yes, you read that correctly.

Q. And the report that's referenced in that first sentence is the report that I have marked as UNU Exhibit 40, correct?

A. I'll take your word for it.

Q. Well, just take a look at Exhibit 40 and tell me whether it's the same one.

A. Does the Washington Post identify it?

Q. Well, let's take a look.

MR. SETTINERRI: I will note for the record that UNU 40 is missing pages.

ALJ TAUBER: So is the Bench's copy.

MR. MARGARD: As is mine.

MR. VAN KLEY: Well, we have a copying snafu.

ALJ CHILES: Let's go off the record.

(Discussion off record.)

(Recess taken.)

ALJ CHILES: Back on the record.

Q. (By Mr. Van Kley) All right. You have had about 15 minutes to determine if the report marked as UNU Exhibit 40 is the report that was referred to in the Washington Post article that was provided to you and labeled as UNU 39. So have you determined that?

See if I can help you out a little bit by referring to some language on UNU Exhibit 39. Look at the first page of that article, you will see -- look about four lines from the bottom where it says; "But David Michaels, director of the project on scientific knowledge and public policy and GWU's School of Public Health and a senior author of the report, compared the industry's behavior to that of tobacco and pharmaceutical companies that were found to have withheld damning evidence of risks associated with their products."

Did you see that language in there?

MR. SETTINERRI: Your Honor, at this time I will object to the use of UNU 39. It is hearsay. It is not being used to impeach a prior statement; therefore, we object to the use of the reference of UNU 39 in the questioning. It's being used to link UNU 40. Again, it's not being used for an allowed exception to hearsay for impeachment purposes.

ALJ CHILES: Mr. Van Kley.

MR. VAN KLEY: Yes, your Honor. I have a bunch of responses to that. First of all, as with the use of this very exhibit in the Nevada trial in which Dr. Mundt testified in less than a year ago, it is appropriate to use a document such as this for

impeachment purposes. It doesn't matter whether if it has hearsay in it if it is used only for impeachment purposes. The document itself will not be admissible into evidence. It will not be offered into evidence. Its use as an impeachment tool is highly appropriate and allowed under the rules of evidence.

The article has statements from Dr. Mundt in it, which we intend to question him about. It has information in it that we intend to question him about. As I said, the article itself is not being used as evidence, but provides a good tool to question the witness about what he knows concerning this incident.

ALJ CHILES: Mr. Settineri, do you have a response?

MR. SETTINERRI: Yes, your Honor. This article is certainly being used as evidence to establish the link that this is the document referenced in this article. It is improper use of UNU 39.

ALJ CHILES: The objection is overruled at this time for the purposes that you expressed, Mr. Van Kley.

MR. VAN KLEY: Thank you, your Honor.

Q. (By Mr. Van Kley) Dr. Mundt, did you see the language I just quoted in Exhibit 39?

A. Yes.

Q. Does that help you determine whether Exhibit 40 is the report that is being referenced in Exhibit 39?

A. No.

Q. It doesn't? Okay. We will come back to Exhibit 40 then independently of that after we have asked you some questions concerning the events that are discussed in Exhibit 39. As I said, I will give you opportunity to explain what happened, in your own words.

Now, it's true, isn't it, that you did a study on the health effects of hexavalent chromium for a company named Elementis?

A. No. I performed an epidemiological study of several hexavalent chromium producers in the US and Germany on behalf of a trade association. Elementis was one of the members.

Q. Okay. Very good. And you studied four plants --

A. Yes.

Q. -- in that study, right?

A. Correct.

Q. And two of those plants were in Germany and two of those plants were in the United States?

A. Correct.

Q. You wrote a report addressing the findings from those four plants, correct?

A. I wrote several reports.

Q. Okay. One of the reports described the results of your findings for all four plants?

A. Correct. That was the report to the client, the sponsor of the study.

Q. And in your study, you evaluated the effects of exposure to hexavalent chromium on workers at these plants, right?

A. Yes. That was a mortality study so we studied cause of death among workers at these four plants.

Q. And you studied the effects from different degrees of exposure for these workers, right?

A. Well, we -- it turns out the different plants had very different exposure levels. Some plants, the two German plants, were very old, and they had operated over many years, where the conditions and the equipment were not comparable to the US plants, which were much newer and much

cleaner. And so it gave an opportunity to look at what we hoped to have available, a broad spectrum of exposure scenarios so that we could evaluate dose-response relationship between exposure and mortality, specifically to lung cancer.

Q. Would you go to Exhibit 40, please. This is a report by David Michaels and other persons, right?

A. This looks to me like a manuscript that might have been submitted to a journal for publication. May I ask if it has been published and do you have the published copy of it?

Q. I don't know.

A. I don't know this from a term paper.

Q. Well, isn't it true that you're independently aware that David Michaels wrote a report criticizing the failure of the chromium industry to release the report on the effects of chromium that you just described?

A. I don't think that's an accurate statement. I know that Dr. Michaels has written a number of things in various advocacy attempts, but I don't know that he has specifically written about what you have described.

Q. Go back to Exhibit 39, please, the second

page. I've already read to you the language towards the middle of the page that states, "Most surprising was a 153-page report summarizing an industry-sponsored study of workers in chromium plants in the United States and Germany. The study was the most thorough ever to include workers exposed to low levels -- just what OSHA had asked for. But its results had never been released."

The next sentence states, "The report concluded that exposures ranging from 1.2 to 5.8 micrograms resulted in a fivefold increase in deaths from lung cancer."

Then it goes on. It says, "'Here you have an agency repeatedly asking for data of this kind, and nothing is forthcoming,' Lurie said.

"The contract scientists who led the study had gone on to divide the data into two sets and changed the way they grouped the workers. As a result, one study -- published in 2004 -- found no increased risk, and the other -- soon to be published -- found an increased risk only in those with very high exposures.

"Those manuscripts were submitted to OSHA."

We will skip the next paragraph. The

paragraph after that says, "Kenneth Mundt, a scientist with Arlington-based Environ, which conducted the study for Chromium Coalition, said the decision to split the data was based on 'scientific issues,' including differences in the way samples were obtained at the US and German plants.

"He did not have an explanation for why he ultimately lumped workers together different than they were in the initial, unpublished version -- a change that blended the intermediate-exposure workers with the low-exposure workers and resulted in a finding of no risk.

Go on to the next page. It says, "Mundt said that he was under no pressure from his industry sponsors to doctor the data."

And then the next paragraph says, "Joel Barnhart after Elementis Chromium in Corpus Christi, Texas -- who served as chairman of the Chromium Coalition -- said he could not recall how decisions were made with regard to the analysis and publication of the data."

Did I read that all correctly?

MR. SETTINERRI: Your Honor, I move to strike the question. This is more than using this article for impeachment. We just read into the

record in this proceeding pure hearsay. To me that is now read into the record pure hearsay. If questions want to be asked about this article, there are ways to ask questions without reading into the record statements from other individuals as reported by someone from the Washington Post. Hearsay becomes double hearsay.

ALJ CHILES: Mr. Van Kley.

MR. VAN KLEY: Yes, your Honor. If counsel would stop objecting and let me ask the questions, it will do exactly what he's asked me to do. My first question was to just make sure I read the information correctly. Now I will ask him some questions about it.

ALJ CHILES: The motion to strike is granted and the objection is sustained.

If you want to rephrase your question so you're not reading this into the record, that would be helpful.

MR. VAN KLEY: Your Honor, I have to read some of it into the record just to ask the question, so if you want me to break it down, I could do that. Is that what you're asking?

MR. SETTINERRI: I will just object because again we are reading hearsay into the record

in this proceeding, which can be used on brief to submit to the Court.

MR. VAN KLEY: In impeachment there's no way to not read it into the record because the record has to show what you're impeaching him on. It's used for impeachment. It's not used as evidence, and it's used as impeachment in the transcript in the record.

ALJ CHILES: In light of our prior ruling, you can ask the question, and if Mr. Settineri wants to object to individual questions, he may do so, and we will deal with those as they come up.

MR. VAN KLEY: All right.

Q. (By Mr. Van Kley) Let me develop this by breaking it down piece by piece. First of all, we already established you wrote a report on the workers in chromium plants in the United States and Germany; right?

A. I conducted an epidemiologic study of plants in the US and Germany and wrote and submitted a report to the client in which all of the results were pooled.

Q. And your report concluded that exposures to hexavalent chromium ranging from 1.2 to 5.8 micrograms resulted in a fivefold increase in

deaths from lung cancer, correct?

A. I seriously doubt that. This thing you are referring to is full of technical errors, and without the document here, I can't say what the actual conclusions were, but that certainly doesn't sound right.

By the way, I never had the Chromium Coalition as a client. There are many errors. This is very bad scholarship.

Q. Who was your client?

A. I told you earlier, it was the Industrial Health Foundation.

Q. And the Industrial Health Foundation, who are they?

A. A trade association of the chromium chemical manufacturers from the US, UK, and Germany.

Q. Okay. All right. You tell me what your report showed.

A. I'm not here to testify on that report. I don't have it. I'm happy to provide it to you. It's publicly available.

MR. SETTINERRI: Objection on relevance.

Q. Well, your initial report, this report about the four plants, certainly concluded that exposure to hexavalent chromium resulted in an

increase in deaths from lung cancer, didn't it?

A. Yes. I don't believe you asked me that question. But, yes, the study showed a very clear positive association with hexavalent chromium exposure.

Q. Okay. Isn't it true that the initial report you wrote showed that there was a statistically significant relationship between exposure to hexavalent chromium in two groups of workers, one that had been exposed at higher levels and one that had been exposed at intermediate levels?

A. I'd have to look at the results from that. That, by the way, was a report to the client. It underwent full peer review, including a scientific advisory board that suggested ways of improving it scientifically that included separating the pieces into those that made more sense.

The German study, the German plants had much older plants and much higher exposures, and the exposure metric was urinalysis results. The US plants had nearly no exposures. They only had air monitoring results, and the most important thing is they only had two or three lung cancer deaths rendering that uninformative.

So the enhancement to the analysis at the

advice of the scientific advisory board and peer review -- it was presented at a public meeting with 200 colleagues present. The results of gathering all of that information led to the appropriate and scientifically correct decision to focus on those people who were actually exposed to hexavalent chromium, and we had proof of it. It was in their urine at very high levels, and there we saw an amazing dose-response relationship, amazingly clear.

It was nothing new. It had been known for many years. We did replicate the earlier findings of this relationship and on which the attention should be focused, rather than the earlier report provided to the client before the work was completed.

Q. So as the result of that review, your report was split into two reports, right?

A. Not exactly. The report was large and described the full methodology in great detail. It's, in fact, a study that has been praised by USEPA because of its thoroughness and its methodology.

The results were more appropriately reported in the two publications. In the Journal of Occupational and Environmental Medicine, they both were published there, I believe. The one that's most

important is the German study where the exposures were high and the risks were high.

Q. And the results of which set of plants were submitted to OSHA in 2002?

A. I think that needs some background. What are you talking about, submitted to OSHA? I just described the study I did and the results that I published.

Q. Okay. As a result of the review that you've talked about, where you were advised to revise the report --

A. Are you talking about my scientific advisors, the most senior epidemiologists in the country? Are you talking about that review?

Q. I'm talking about whatever review you just talked about where you said you went to some scientific board and they advised you to change your report.

A. Well, it's a bit of a paraphrase. I mentioned two things. One, it was presented in an international conference of occupational epidemiologists and physicians, at which time there was a lot of discussion about whether it made scientific sense to try to force these two groups like apples and oranges together to get a single

result. So that was one.

Two, we took the same report to our own scientific advisory board, and they're identified in the report itself, and they essentially said the same thing. This is a valiant effort to try to have a continuum of exposure, but there's so many differences between these groups. One I didn't mention was the German plants had no women. The US plants had significant amounts of women.

So it was a methodological mess. We tried our best to make it work because we said we would put all these plants' data together. The scientists, the most trusted, including Harvey Checkoway, he wrote the book on epidemiology -- put his name in, I guarantee it comes right up in Google -- says you have to look at this a different way.

And we don't lose information by reporting information separately. All the results are still there, but the mixing, the confounding of having them together is clarified. It's a little bit like doing a study of all people on a condition that they behave separately, differently, between men and women. You will just get a weird average. But if you separate men and women, you'll see that men have

a stronger association and women have a weaker association. It's comparable to that.

By separating out the high level of older population of Germans from the younger mixed, and you have the whole issue of the exposure measures done with urine in Germany and general air monitoring in the US, they couldn't be harmonized. So in separating them, you actually improve the validity of those two parts.

Now, it appears that Dr. Michaels doesn't like the correction, the scientific corrections made, because they happened to reduce what appeared to be the risk in the middle exposure level. There wasn't a middle exposure level. There was a high exposure level and a low exposure level. The high level had risks. The low level had no risk.

If you artificially blend those together, it is going to look like there is some risk in the middle where there was none observed. So that's the, quote, unquote, report, and the subsequent publications. It was not just simply splitting it, but it was reporting the results stratified by country, US-Germany.

Combine those two reports, cover every single person, every single exposure estimate and the

risks comparing them to the rates of lung cancers in their respective states, in the US and in Germany. It is one of the most detailed epidemiological studies you will find on this or on any topic of occupational exposure if you read the actual papers that were published and not the Washington Post or other uninformed and unscientific sources.

Q. So after all of this occurred, there was a report that was submitted to OSHA during OSHA's rule-making to determine what safety standards should be established for hexavalent chromium in the workplace, correct?

MR. SETTINERRI: I object at this time, your Honor, to the relevancy of this line of questioning. We have gone pretty far into it at this point.

ALJ CHILES: Mr. Van Kley.

MR. VAN KLEY: Your Honor, there are two reasons why this is relevant, and the witness has done his best to prevent me from getting to the point, but we can get to the point with a few more questions.

The first is with respect to this witness' credibility. He's criticizing other people's epidemiological studies, for example,

Dr. Nissenbaum's, yet this witness himself has engaged in practices that have skewed the results of epidemiological studies he's done. That's the first thing.

The second point is with respect to the use of epidemiological studies to evaluate health effects at all and whether it's even appropriate to argue in this case that an epidemiological study has to be done when, as we have already seen in what the witness has been willing to divulge to us so far, that epidemiological studies can be easily skewed to come to the results that the author wants them to. So it's relevant for those two reasons.

Now, the witness and counsel have done their best to prevent me from getting to the point, but the point can be made as long as we can bring these questions to a conclusion.

ALJ CHILES: Mr. Settineri, do you have a response?

MR. SETTINERRI: Your Honor, we have explored this questioning. The witness has answered the questions. At this point just because counsel hasn't gotten the answer to questions he's asked, it doesn't warrant continuing to explore an area that is not relevant.

ALJ CHILES: Thank you.

I will allow the questions at this point. The witness may answer to the extent he holds an opinion or holds knowledge on the subject.

Do you need the question read back to you?

THE WITNESS: Yes.

(Record read.)

A. What report?

Q. I'm asking you whether a report that was developed from your study was submitted to OSHA as part of its rule-making.

A. I didn't submit a study to OSHA. If you are talking about the report that I prepared for my client, I couldn't because I didn't own it. I explained that to Dr. Michaels over several telephone calls when he asked me for it. I directed him to the client. The client owns the work product.

He said, "That's too bad, I've already written about you."

I said, "Well, you can change it. You can correct it if you have the integrity to do so."

I did provide a copy of the report confidentially to the Office of Management and Budget under the Executive Branch that's OSHA's boss. I

went over OSHA's head because, in fact, I was contacted by an epidemiologist at OMB who was writing the Federal Register request for evidence for OSHA to consider in their rule-making.

I explained to the OMB, the Executive Branch overseeing OSHA, that though I had a copy of the report, it would be illegal for me, I would have to violate my contract to give something away that wasn't mine to give away, and they needed to obtain it from the industry. So I think that's the report you're talking about.

So I did give it to the OMB, and they accepted it confidentially. The government had it before OSHA even started their rule-making, but I was trying to protect and trying to stand up, as I would do for any client, on the matter that was of legal importance. I don't think I could be asked to violate a contract, and I think OMB agreed with me, and, therefore, accepted that I did not provide that to the public record.

But they did encourage me to finish the manuscripts that were languishing so that those could be available to OSHA. The first one that was submitted, it was the simplest one, the US workers. It was immediately accepted, although it is hardly

informative.

The second one was submitted a month later, and it was tied up in review for six months. It's highly unusual. It was tied up for six months, the entire period of the OSHA ruling. So you have to ask who the journal reviewers were, why they would sit on it for six months and not give an answer.

As soon as the OSHA ruling period was closed, I got a letter from the editor rejecting the acceptance of that manuscript. Almost without changing it, I submitted it to another journal, and it was accepted without change.

There was clearly something going on that was well beyond my control that held up this German study that actually shows risks and would have been useful to OSHA, but OSHA needs these things once they've been through the peer-review process.

I just followed the advice I was given by OMB, OSHA's boss, instead of David Michaels, who at that time was with some advocacy group at George Mason University -- or had some affiliation with Public Citizen, I'm sorry, not George Mason University. I think he had a faculty appointment there as well, but it had nothing to do with -- I had no opportunity to provide that what was alleged in

various attacks, including Dr. Michaels. I had no opportunity to provide this in a legal manner, and I followed the advice of the folks at OMB, who initiated the request on behalf of OSHA.

Q. So if I'm understanding what you're saying then, just to get the chronology here so the record is clear, the first thing that happened you wrote a study on all four plants collectively, right?

A. Right. That was proposed to the client. I went to the client to do this work because I thought it was interesting and important work. There were other parties interested in doing it. We competitively won the bid, and it was to combine not just four, but six plants, two from the UK, and that was the intent. And that protocol and that proposal all went through peer review, and it was thought to be the best approach.

Q. Okay. Then a new report was created on just the two US plants and just the two German plants?

A. Before that the two UK plants never joined the project. Their industry is struggling. They stepped aside hoping to join the study at some point. They never did. Now we have four plants in two different places, two in Germany, two in the US.

We were pressured to finish up the report because the sponsor was going bankrupt, so they finished paying for what was agreed in doing the work, conducting the research. The report had to be produced to get the final payment before the bankruptcy proceedings went forward, and so the final report became, you know, this focus of attention, was necessary for administrative reasons and to close out the contract.

I never retained ownership of the data or the report. That was the -- that was dealt with by the bankruptcy court. I was encouraged, however, and voluntarily and at my own expense continued to work to move this research into publication.

It was not required for us to close out our relationship with the then bankrupt entity, Industrial Health Foundation. We personally and professionally put in the work effort to get those papers out, hoping that -- and at OMB's request that they would be accepted in time to submit to the OSHA docket.

I mentioned earlier, the first one was immediately, even though it was an uninteresting paper, and the second one, I'm curious to this day why it was held up for six months, whatever, at least

a couple months, at least until the OSHA docket closed. It was beyond my control, again, not my intent.

So it is quite amusing that you and others have made such strong statements without first asking me my side of the story. I appreciate, as you promised earlier, that you at least let me do that after your personal attack on my professional integrity because now I think the record can be a little bit clearer.

Q. Just for clarification, the first study that was submitted to OSHA, which you phrase as "uninteresting," that was on the German plants or US plants?

A. I didn't submit anything to OSHA.

Q. Okay.

A. When it was published in the public record, OSHA can get it for themselves. The first paper published was the US studies.

Q. Okay. So the paper -- and you did that paper? I mean, you revised your original paper to create a second paper on the US plants? That was your work, right?

A. You have to understand, the first report is highly detailed, half an inch thick, completely

documenting everything that was done, and that's why it is not publishable. That's a study archive. That's something that is very important to communicate or to go back to help understand what results you get a year or two later.

From that, the data reflected in these various plants in different parts of the world, statistical analyses are done, and the short report, something like this, is produced that can be accepted by a journal that summarizes the methodology, summarizes the results, but doesn't go into the same detail as the big report. So the two papers that were published are extracted from the big report summarizing the methodology and detailing the specific results.

Q. And you wrote both of those reports?

A. Yes.

Q. So you wrote a report about the US plants, and that was submitted to OSHA for the rule-making docket, right?

MR. SETTINERRI: Object, asked and answered. We have been through this. He gave -- the witness gave a very thorough explanation of the chronological events. At this time that question has been asked and answered.

ALJ CHILES: Mr. Van Kley.

MR. VAN KLEY: I think he's right. I wanted to make sure it is clear for the record. I think it was a little garbled. I just wanted to make it clear. It's a clarification thing.

ALJ CHILES: Overruled.

A. The first paper, the US plant paper, was published. Presumably, it was made available or OSHA obtained it because it was not published publicly. It came before the German study, which was delayed by the review process for some reason, but quickly accepted upon resubmission to a different journal. It wasn't that it was inherently unpublishable.

Q. The fact that the results of the study on the German plants was not submitted to OSHA during its rule-making later became the subject of an OSHA enforcement action, didn't it?

A. It didn't become -- it wasn't submitted to OSHA as it wasn't published yet. It was stuck in the review process, and one can only guess why it would have been tied up. You have to believe or think, at least, they didn't like the results of that. But certainly anyone interested in having that information moved into the OSHA docket would have moved along in their reviews and not held it up.

Q. Isn't it true that OSHA actually took an enforcement against Elementis Chromium because the results of the German study were not submitted to OSHA earlier?

A. I don't know about that.

Q. Well, you stated that you testified at an EPA hearing recently, right?

A. EPA is a different animal.

Q. I'm just changing topics on you. EPA sent out a notice of violation to Elementis Chromium as a result of that company's failure to submit the German -- the results of the German study to EPA earlier; isn't that correct?

A. I don't know the basis for it, but they certainly did file an action against Elementis, and it was that action which I testified in in the EPA trial. Keep in mind, Elementis was one member of the IHF that commissioned the work, so it was not directly involving me, other than that was my work product that I prepared on behalf of the IHF.

Q. By the way, do you know what position David Michaels is today?

A. Yes. He's the head of OSHA, Assistant Secretary of Labor.

MR. VAN KLEY: May I approach the witness

with another exhibit, your Honors.

Your Honor, we would like to mark this as UNU Exhibit 41.

(EXHIBIT MARKED FOR IDENTIFICATION.)

ALJ CHILES: Can we go off the record for a moment.

(Discussion off record.)

Q. I've handed you what has been marked as UNU Exhibit 41, which is an article from the Houston Chronicle archives entitled "In strictest confidence, Second opinion in an 'extremely unusual' event, a doctor under industry contract reversed his damaging conclusions in a study of worker deaths involving vinyl chloride."

Have you seen the article before today?

A. Not that I recall.

Q. Okay. Well, let me just ask you based on your independent memory then about some events regarding your involvement with a study that you did on vinyl chloride. And I think the point here is twofold. I guess the main point is to illustrate some of the principles that you've described in your testimony concerning how an epidemiological study should be performed. We already established you have done some studies on the health effects of exposure

to vinyl chloride. You were not the first person to perform those studies, were you?

A. No. We, again, competitively bid, not only on cost but on quality, for that work, and it's ongoing. This study is now going to be probably next year published for -- what would be the final update of the mortality of this cohort.

Q. And in fairness to you, you have found that exposure to vinyl chloride does cause cancer, right?

A. Yeah. That's no surprise.

Q. Right.

A. That was known in the first study. In fact, this study was the result of some concerns of some unusual cancers occurring in one plant and were appropriately followed by an epidemiological study that was properly conducted and quickly confirmed that cancer association, leading to the strict reduction of exposure limits to vinyl chloride in the workplace and are still upheld today. That was in 1974, I believe.

Q. Okay. You did a report in 1996 on three plants that used vinyl chloride materials or produced them; is that right?

A. I published about a half dozen studies on

vinyl chloride. I have to know which one you're referring to.

Q. Let me see if page 4 of this article will refresh your independent recollection of that study. Tell me when you get --

A. I'm on page 4.

Q. Go down about halfway on the page. You'll see there is a paragraph saying that you "began a separate study for a company called Vista in 1994 reviewing cancer deaths at the company's vinyl chloride plant in Lake Charles and its PVC plants in Aberdeen, Mississippi." Do you see that?

A. Yes.

Q. Do you recall doing that study?

A. Yes.

Q. And the next paragraph refers to a final report that you prepared and produced in 1996. Do you recall that report?

A. That is the report. Is it not the same?

Q. Isn't that the report you did on the study that -- didn't you do a final report in 1996 on the study you started in 1994?

A. Yes.

Q. Okay. And the results of that study showed elevations of brain and pancreatic cancer for

the workers, and then for white workers only, it showed lung cancer. Do you recall that?

A. Yes.

Q. Okay. The article says, "None of the elevations was so striking that it pointed to a workplace problem, Mundt said." Do you recall what you concluded in that report with regard to whether there was a workplace problem?

MR. SETTINERRI: At this time I will object to the first part of the question where he directly cited the article. Again, it's hearsay.

The latter part of the question I have no objection to that, but, again, reading the article into the record is hearsay and can be used on brief and go before the Board.

MR. VAN KLEY: It is impossible to impeach a witness on the contents of a document without reading portions of it into the record. What counsel is trying to do is prevent me from impeaching him.

ALJ TAUBER: Mr. Settineri.

MR. SETTINERRI: Yes, your Honor. Under Rule 809, to attack the credibility of a witness, the hearsay statement has to be admitted into the record. This is not in evidence. Moreover, it was used to

refresh his memory. Now we've switched to reading it into the record as hearsay. It is one thing to ask a witness, Do you recall doing this? Do you recall the report? Do you recall the findings? That was done for a few questions. Now we've changed to reading into the record what the article says, which is hearsay.

ALJ TAUBER: Mr. Van Kley.

MR. VAN KLEY: Rule of evidence 616 says, Factors contradicting a witness' testimony may be shown for purposes of impeaching a witness' testimony. If offered for the sole purpose of impeaching a witness' testimony, intrinsic evidence of contradiction is inadmissible unless the evidence is one of following, et cetera, et cetera.

That doesn't say, however, that you don't read the statement into the record so that the reviewing court or the trial court in this case has a record of what it was that was used to impeach the witness. You got to have -- since the document itself is not going to be admitted into evidence, per the rule that Mr. Settineri just cited, I got to read the statements so that the record shows what was used to impeach the witness' testimony. That's the first purpose.

The second purpose, as stated, is to refresh the witness' memory, and in order to do that, you got to read the sentence to him so he has something -- so you have something in the record showing that was used to refresh the memory of the witness.

ALJ TAUBER: Consistent with the Bench's previous ruling, we will allow the question, but we will ask you to rephrase it, Mr. Van Kley.

MR. VAN KLEY: Sure.

Q. (By Mr. Van Kley) Do you recall what the conclusions of your report in 1996 were with respect to whether the results of that study showed there was a workplace problem?

A. No, I don't. It was an awful long time ago, about 100 studies ago.

Q. Let's look further down on the page and see if we can jar your memory a little bit more.

A. Why don't we look at the report itself?

Q. Because I don't have the report.

A. We found in the earlier memory-jarring piece that there were a lot of inaccuracies. I'm not sure I would want to trust a newspaper article over a scientific paper.

Q. Well I'm not asking you to accept the

statements in this article. I'm using it in an attachment to refresh your memory as to what you believe you concluded.

A. I think I answered that I don't remember a 25-year-old paper.

Q. Pardon?

A. I do not remember the details of a 25-year-old report.

Q. Okay. Let's go further down in the article and see if that refreshes your memory then. You will see further down on the same page it is stated that three mortalities were left out, were excluded from the study. Do you recall excluding three mortalities from the study?

MR. SETTINERRI: Same objection, your Honors. He read into the record again. All he had to do was ask "do you recall?"

MR. VAN KLEY: I didn't even read from the document this time.

ALJ TAUBER: I'll allow the question.

A. I think you have to understand how this study is done in the first place. This is a little bit silly. It's a cohort study, so we identify -- a cohort study is described in my rebuttal testimony so you know what that means. A cohort, or group of

people, is identified as comprehensively as possible. In this case it was all of the workers at all of those plants, Vista plants I believe they were at the time, and they are then followed over time.

So in these plants, as we do in most mortality studies, we start with an entire roster of everyone who ever worked there. The only way we get that information is what companies give us. We go pretty deeply into files. We put teams of people with computers for weeks into some of these plants to extract information.

Those people are then followed through social security and through the National Center of Health Statistics' National Death Index. We identify everybody through public records that we can who is deceased. For every decedent, we then go to the state in which they died and get a copy of the death certificate and have it professionally coded for cause of death.

Since 1979 the National Cancer and Death Index provides us -- well, they've always collected cause of death, but only since the middle '80s, maybe close to '90, they now give us that information, legitimate investigators, after going through a lot of applications and assurances, are allowed to access

this information.

We can access any death in the US and cause of death of any individual in any of these studies, once we put the appropriate assurances in place. We have done this many, many times, and we are doing this again for the larger group of vinyl chloride workers. This was just the beginning of a much larger study, which is now being updated, following those workers for up to 60 years.

Now, can someone say in a newspaper article, Oh, somebody should have been in that study? Well, sure. Show me the evidence that they should have been in the study and we can put them into the study.

As I recall, these folks didn't meet the definition of the group that was studied. They had to be employed for a year, I recall, between some time period of operation, and they had to have been at that plant or had to have been involved in the operations where vinyl chloride exposures were likely. They could have been employed in some other part of the plant and otherwise excluded.

That's where also in my report the quality of epidemiology study will specify the inclusion criteria. So the first question would be

to anyone, a newspaper article writer or lawyer alleging that an employee should have been in the study is say, All right, why wasn't he in the human resources record or database?

The second thing that is quite preposterous is the accusation that a person or persons that might have eventually died of brain cancer was someone known by the plant when they were still working at the plant that someday they would have a brain cancer, because the allegations have been made against the plants that they didn't provide us the basic information to track that individual.

So I don't understand these things because I don't believe them for a minute, and I know the thoroughness with which we have gone through the records at all these plants, and I know the assistance we were provided to make sure everything was found and record systems were triangulated to include as many people as possible for purposes of the study.

Q. Well, there were?

A. Without facts, I can't respond scientifically to the things that are not even scientific. They don't even have a scientific paper that it is referring to.

Q. Well, let's look at the fifth page of UNU Exhibit 41. You will see the second paragraph refers to an employee that died after 18 years at the plant but yet was omitted from the study. Do you recall that?

A. Again, you're reading from a newspaper article. I would like to see the personnel records. If somebody presented the personnel records from that plant, the basic raw materials of doing an epidemiology study is that, yeah, you can claim someone should have been in that study, but if they weren't in those records and we have no record of that person, then who knows? Maybe it was a contractor.

People believe they worked for a company when, in fact, they worked for a contractor and were on site for 18 years. These are things that show, you know, the carefulness of epidemiologic inquiry can't be taken lightly. It's very easy for lay people to see something that they think is funny without producing the basis for that, and it stays in the record forever.

I would like to say that this has now been rolled into a study of all plants that have vinyl chloride producing workers that were formed

back in the '70s and is being updated, as I said before, through almost 60 years.

That study is one of the pillars for all of the regulations having to do with vinyl chloride today. That study was combined with a European study in a review done by the International Agency for Research on Cancer, pooling the results to list all of the associations with vinyl chloride.

You know, any bit of scholarly research will show what role these studies have had in the literature on this topic and in which occupational health, medical, and regulatory decisions are made. I don't refer to the Houston Chronicle or the Washington Post when I'm doing a scientific study.

Q. Well, let's talk about your own statements then. It says here that "Mundt said that he learned of Stark too late to add him." Do you recall making such a statement?

A. Not at all. When was this and with whom was this? I do recall having spoken to a reporter from the Houston Chronicle and then seeing what was written, and I was like, "Really?" Things that I really didn't say are attributed to me or things I would have said very differently. So I would say I wouldn't rely on a newspaper article for any

scientific conclusion.

Q. When you were doing your work in 1994 to 1996, or even now, were you aware of an earlier study that had been done by a person named Otto Wong?

A. Not only was I aware of it, but I acquired all of the data from Dr. Wong's study because he was unable to follow up some thousand-plus people. They were able to identify them, but they didn't have sufficient information, like social security number and date of birth and whatever, to follow them through the public records to determine their mortality.

Not only did we acquire Dr. Wong's data, but we were able to restore almost all of those that he was not able to do through somewhat heroic efforts, but with a lot more modern techniques for identifying, tracking, following people. We replicated all his results. We made corrections to the database. All of it is documented in our report to the client, which -- and from it, the fairly monumental report published in Occupational and Environmental Medicine.

Q. Earlier Dr. Wong had concluded that perhaps his results showing an excess of brain cancer deaths among workers might be the result of

diagnostic bias; is that correct?

A. You're saying this is what Dr. Wong thought?

Q. Yes.

A. I can accept that if you have some reliable source for that information. I don't know what Dr. Wong thought.

Q. I guess maybe I should rephrase the question and ask you, do you know that Dr. Wong said that his earlier results might have been the result of a diagnostic bias?

A. Well, I know that when we bid for this work, we put a lot of effort into it because we were a new consulting company, and this was, in my mind, an important question, brain cancer question. It was of personal interest to me. By the way, Dr. Wong was also bidding for this work at the same time. What his view on the actual brain cancer is I don't know. What I was interested in was producing the science so it would be answered. You wouldn't have to rely on beliefs or newspaper article statements.

By the way, yes, we found excessive brain cancers. If you read the report, the scientific paper, not the newspaper article, we reported an excess of brain cancers in that group attributed to

the group that had worked at the earliest time period, and that excess actually attenuated over time through a period of fairly high exposure, so it remains ambiguous if it was a result of the vinyl chloride exposure or some other chemicals in the facilities in the '30s and '40s where conditions were largely uncontrolled.

The parallel study to ours done by the International Agency for Research on Cancer in Europe didn't find an excess of brain cancers, and those studies are roughly the same size. When we pooled our results and published what's called a meta-analysis of all of the studies on vinyl chloride, it was concluded that there was little support for that hypothesis that brain cancer was caused by vinyl chloride, despite the positive finding that is in my report from the US study.

Q. Let's go back to your testimony, your written testimony. Please go to page 27 and then page 28 of your direct testimony. I'm interested in your comments about blinding. And you state that Dr. Nissenbaum's questionnaire did not engage in blinding the participants to the main study hypothesis.

If you were going to perform an

epidemiological study to determine whether turbines caused adverse health affects, how would you go about blinding the participants to the hypothesis?

A. I recall that there was a -- sorry, I'm hesitating here. Several of the published studies described those methods. Shepherd, if I remember, describes those in fair detail. And that Shepherd study, though it is not strong, it only has 30 people or so, at least made a reasonable effort to -- I think they call it masking the hypothesis from the participants.

Q. Okay.

A. Since I can't find it, you can look at it in your spare time.

Q. I'd be happy to do that.

A. The surveys are often, I'd say mostly, done where there are both efforts to mask the participants or blind, and ways that that's done, first of all, is not title your questionnaire with the underlying hypothesis. I think Shepherd does and others call it a community health study where they then have what are called decoy or distracting questions, questions that are mixed in with the questions you really want to know about wind turbine things, like traffic and animal noises and the noise

from the air handling system in your house, or whatever, so the participant views it as a general health study and doesn't rivet on any one or another of the exposures.

I also go on in my rebuttal testimony to describe double blinding. That's a term taken from -- there's also triple blinding, but double blinding is where the investigator himself doesn't know, say, in a clinical setting whether he's prescribing or giving the participant the treatment or the placebo.

So great and painstaking care is made in research, especially experimental research, but we use it as a model for observational research. Great care is taken that the investigation itself doesn't influence the results. So masking, blinding, decoy questions, administering it through a person who doesn't also understand what the hypothesis is, so, say, the nurse helping out a participant doesn't interpret a question -- excuse me. I apologize -- a nurse doesn't inadvertently lead the respondent to an answer that's unacceptable.

So there are numerous techniques for achieving this. I think Pedersen does a pretty good job of it and describes this concept in several of her papers as well.

Q. We will revisit that, so we will look at some of the papers in light of your comments on those papers in your testimony.

MR. VAN KLEY: Your Honor, could I approach the witness with Exhibit 42?

ALJ TAUBER: Yes.

(EXHIBIT MARKED FOR IDENTIFICATION.)

ALJ TAUBER: Before we do that, let's take a quick five- or ten-minute break.

(Recess taken.)

ALJ TAUBER: Back on the record.

Mr. van Kley.

Q. (By Mr. Van Kley) Before we get to the next exhibit, I'd like to ask you more questions about your testimony generally. Would you go to page 32 of your testimony, please. About halfway down that page you make a couple statements about serious harm. The one sentence states that none of these studies provides sufficiently strong evidence to validly inform a conclusion that industrial wind turbines cause serious harm to human health.

The next sentence says, "This is particularly true when the study specifically defined 'annoyance' as the primarily outcome, and not any condition that can be considered a disease or a form

of serious harm."

Could you give us a definition of "serious harm" as you've used it in your testimony?

A. I've used it here as a lay term, not as a technical term of art, to differentiate disease, a commodity that we normally are dealing with when we are talking about threats to human health to differentiate from annoyance.

Q. So any disease would be serious harm, in your opinion?

A. Yes.

Q. And how do you define "disease," as you've used it here?

A. Well, I can't say any disease constitutes serious harm, but I'm trying to draw a line where it is quite ambiguous, and the terms, unfortunately, have been used interchangeably, and some, including Pedersen, have stated that annoyance has to do with human health.

So let's say that, again, not because this is something that I'm often asked to do, but to draw the line on what constitutes a disease or harm to human health, would probably say that something that could be reflected in a -- I take that back. I guess I don't have a definition for that.

I would reflect that it is an effort to distinguish those things that are not considered threats to health, that are not considered diseases. I think harm is not clearly defined, and one of the problems across some of this literature is a lack of standardization of terms

Q. As you used the term "serious harm" in your testimony, would that include chronic headaches?

A. I have to clarify whether we are talking about a serious condition or serious harm? For me there's a difference. Chronic headaches, migraine is a serious condition. Is it the result of some specific cause is when we are talking about harm. Harm implies a cause. So I don't know if you're asking -- I know what you're asking, but I don't know what you are intending to ask because they're slightly related, closely related concepts.

Q. I guess I'm just trying to find out what your opinion means. You stated that none of the studies provide sufficiently strong evidence to validly inform a conclusion that wind turbines cause serious harm to human health, and I'm trying to figure out what that includes. What are you saying does --

A. I think you could carry the same meaning

if you strike "serious." You are really trying to figure out whether wind turbines harm human health. Maybe it was an inelegant choice to differentiate things like annoyance, which are not -- which I don't consider harm to human health.

Q. What about nausea, is that harm or serious harm?

A. Nausea can be a serious health condition. Again, the harm part of it implies there is a known cause, so without trying to complicate this, I would say things that are definable, measurable, and have been classified as diseases could constitute harm to health.

There are, although, degrees of this. A mild transient condition may be of no consequence in one's functioning, but if one happens to be nauseous, you may, you know, need to reduce your activity. Do we attribute the nausea to a specific cause? I don't know. I mean, that's where the element of harm comes in.

I'm sure this is not terribly clear. I guess a serious harm would be a condition that was not reversible.

Q. Go to page 33 of your testimony. Your answer to question 28 discusses "human disease or

other serious harm to human health." Do you define those terms in the same way?

A. The disease is the easy one, and I think that may be one of the better, more straightforward ways of trying to agree on a terminology, where one draws the line. If something constitutes a disease, well, you can measure it and you can evaluate what causes it, and it may have some importance societally to identify the causes in order to prevent it.

Q. But how do you define "disease" in your testimony?

A. Disease I defined previously as the conditions for which there is a disease code in the International Classification of Diseases.

Q. I have handed you what has been marked as UNU 4.

ALJ TAUBER: 42?

MR. VAN KLEY: 42, I'm sorry, your Honor.

Q. UNU Exhibit 42 is what you refer to in your testimony as Pedersen 2004B; is that correct?

A. Yes. It's just 2004.

Q. Okay. Would you go to page 34 in your testimony, please. And you refer to Exhibit 42 on the bottom half of page 34 of your testimony, correct?

A. I refer to Pedersen and Persson Waye 2004, yes.

Q. And that's UNU Exhibit 42?

A. Yes.

Q. You wrote a sentence here which says, "Despite the association between increased sound pressure levels and greater annoyance from wind turbine noise, no differences in health or well-being outcomes, (e.g., tinnitus, cardiovascular disease, headaches, irritability) were observed." See that sentence?

A. Yes.

Q. Now, looking at UNU Exhibit 42, the title of Pedersen's paper is "Perception of annoyance due to wind turbine noise - a dose-response relationship." Correct?

A. Yes.

Q. And then if you look at the abstract, on the first page of that document, the third sentence states, "The aims of this study were to evaluate the prevalence of annoyance due to wind turbine noise and to study dose-response relationships." Do you see that?

A. Yes.

Q. Now, would you agree with me that the

purpose of this paper is to evaluate the association between wind turbine noise and annoyance?

A. That's what they say.

Q. Okay. Did you see anything in this paper that indicates that its purpose or that one of its purposes was to determine whether health impacts were being caused by the wind turbine noise?

A. No. It appears this is focused on annoyance and not the health responses that they collected in the survey.

Q. Okay. And, in fact, the paper doesn't even reveal what responses they received to any questions about health; is that right?

A. That's right. I believe there's six Pedersen papers, and this may have inadvertently been cited as '04 instead of one of the others.

Q. Just to be clear for the record, there's nothing in UNU Exhibit 42 that describes the health effects of wind turbine noise?

A. I believe that's correct, based on my quick scanning of it.

Q. Incidentally, on page 3462 under part C, Questionnaire, it says in the first sentence, "The purpose of the study was masked in the questionnaire." Do you see that?

A. Yes.

Q. So this was one of those studies where blinding was employed?

A. That appears to be their intent, yes. You see the third paragraph of this section C is where they identify the health pinpoints that are cited in my testimony document, page 34.

Q. Where are you referring?

A. It's the last paragraph of section C, Questionnaire.

Q. Oh, yes. There it's stated that the questionnaire asked questions about health, right?

A. That's right.

Q. But the paper doesn't reveal what the answers were.

A. This paper doesn't deal with those. It's one or more of the other Pedersen papers.

Q. Go to page 35 of your testimony. The sentence on the bottom of page 34 of your testimony, which goes to the top of page 35 of your testimony, states that authors found that the risk of annoyance from wind turbine noise exposure increased significantly with each increase of 2.5 dBA. Do you see that in your testimony?

A. Yes.

Q. Would you go to UNU Exhibit 42, page 3464. With respect to the increases of annoyance that occurred with each increase of 2.5 dBA, the Pedersen report on page 3464 states that the proportion of respondents who noticed noise from wind turbines outdoors increased sharply from 39 percent at sound category 30.0 to 32.5 dBA, is that right, to 85 percent at sound category 35 to 37.5 dBA. Am I stating that correctly from the Pedersen report?

A. I'm sorry, where are you in this report?

Q. 3464 under B, Main Results. Let me start over so you can follow me.

A. I see that.

Q. Going to the next sentence it says, "The proportion of those annoyed by wind turbine noise outdoors also increased with higher sound category at sound categories exceeding 35 dBA." Do you see that?

A. Yes.

Q. And then skip the next sentence and you'll see it says, "No respondent self-reported as annoyed at sound categories below 32.5 dBA, but at sound category 37.5 to 40 dBA, 20% of the 40 respondents living within this exposure were very annoyed and above 40 dBA, 36% of the 25 respondents."

Do you see that?

A. Yes.

Q. Is that what you were referring to in your sentence at the bottom of page 34 and top of page 35 of your testimony?

A. The first part of that phrase, yes. The second doesn't directly address. The second part says, "They also reported those with a negative attitude towards the visual impact of wind turbines were more likely to report annoyance with the wind turbine noise."

Q. Right. Let's go to page 3468 of UNU Exhibit 42, and here you will see some discussion of the point that you just raised, the visual impact of wind turbines. Take a look at the left column on that page, specifically the first sentence of the third paragraph. You see a sentence that says, "Data obtained in this study also suggest that visual and/or aesthetic interference influenced noise annoyance."

A. Yes.

Q. That's consistent with what you said at the top of page 35 of your testimony, right?

A. Yes.

Q. Now, go to the right-hand column of that

same page in UNU Exhibit 42. Directing you to the second paragraph on this side of the page, you will see language stating, "Most respondents who were annoyed by wind turbine noise stated that they were annoyed often, i.e., every day or almost every day. The high occurrence of noise annoyance indicates that the noise intrudes on people's daily life."

Continuing with that thought, go to the bottom of that column, the last paragraph, the second sentence, do you see the sentence which says, "Attitude to the visual impact of wind turbines on the landscape scenery was more strongly correlated to annoyance than the general attitude to wind turbines."

A. Yes.

Q. I've read that correctly?

A. Yes.

Q. So when you state on top of page 35 of your report that those with a negative attitude towards the visual impact of the wind turbines were more likely to report annoyance with wind turbine noise, you were referring to the respondents' attitude towards the visual impacts of the wind turbines rather than by the respondents' general attitude in opposition to wind turbines; is that

correct?

A. Well, my next sentence says almost that. "These results suggest an attitude towards visual impact is a predictor of risk factor for reporting annoyance with wind turbine noise."

Q. Where are you looking at?

A. It was the very next sentence following the one you read from my report.

Q. Okay. You can put that report aside for now.

MR. VAN KLEY: Your Honor, I'd like to approach the witness with another document.

ALJ CHILES: You may.

MR. VAN KLEY: This will be marked as UNU Exhibit 43.

(EXHIBIT MARKED FOR IDENTIFICATION.)

Q. Do you recognize UNU Exhibit 43 as a copy of what you refer to in your written testimony as Pedersen 2008B?

A. Yes.

Q. Would you go to page 36 of your written testimony, please. I'd like to direct your attention to the first paragraph on that page of your written direct testimony. Look at the sentence in your written direct testimony which states, "Self-reported

stress was found to be higher among those who were fairly or very annoyed compared to those not annoyed, but these could not be attributed to wind turbine noise." Do you see that in your testimony?

A. Yes.

Q. Would you go to page 4 of UNU Exhibit 43?

A. Which page?

Q. Page 4. Actually, why don't we start on page 3 of UNU Exhibit 43. The very bottom of the page, the last sentence starts off with "No differences," and the sentence says, "No differences as regards self-reported hearing impairment, diabetes or cardiovascular diseases were found between respondents that were fairly or very annoyed versus other respondents."

The next sentence states, "However, respondents who were fairly or very annoyed by wind turbine noise were under more strain and reported stress symptoms; the mean stress scores were statistically significantly higher in this group than among the other respondents."

Now, are the two sentences that I've just read from UNU Exhibit 43 the source of the statement in your testimony that this report says that the self-reported stress could not be attributed to wind

turbine noise?

A. In part, yes.

Q. Where do you get that out of the two sentences I have just read to you?

A. Well, it's in part. They make a number of points here that raise the possibility. Let's even look at the title. This is all talking about raising opportunities, raising possibilities, their hypothesis. So they're not directly able to link it to the stress.

Q. Well, it says in the Pedersen report, marked as UNU Exhibit 43, there is an association between the stress symptoms and being fairly or very annoyed by wind turbine noise, doesn't it?

A. That's correct, yes.

Q. Okay. Looking at the last sentence in the first paragraph of page 36 of your testimony, you state, "No differences in actual health effects such as hearing impairment, diabetes, or cardiovascular diseases were reported."

You took that out of the first sentence that I quoted on pages 3 and 4 of UNU Exhibit 43, correct?

A. Well, I would say no. I said earlier in my previous response, which I'll add to, if I may, my

statements in the report aren't quotes from this but rather syntheses, paraphrases. For instance, where you are riveted on two sentences in the first column of page 4, the second column of page 4, second paragraph, the first full paragraph, it says, "Respondents who were fairly or very annoyed by wind turbine noise," so the group we were talking about in the first column, "were under more strain and reported more stress symptoms." It's exactly what we are talking about in the first column. So to say that I wrote a sentence in my report based on the sentence you read can only be true in part.

Further, it says, "Whether this finding was a result of noise annoyance, poor restoration or due to a general high stress level cannot be concluded from this study as no questions on daily 'hassle' or daily stressors in general were included."

So my report is a synthesis of what is in here, not simply a simplistic reaction to one or another sentence.

Q. With regard to the sentence in your testimony that I've just mentioned, which says, "No differences in actual health effects such as hearing impairment, diabetes, or cardiovascular diseases were

reported," that's not exactly what the sentence on the bottom of page 3 and the top of page 4 of UNU Exhibit 43 says, is it?

A. Right. They're more narrowly contrasting among those who were annoyed, presumably those who were more highly exposed, and if there were an association, where you would most likely see health associations.

Q. Getting to the point, isn't it true that the sentence on the bottom of page 3 and the top of page 4 talks about only whether there were differences as regarding self-reported hearing impairment, diabetes, or cardiovascular diseases and it doesn't mention any other types of diseases?

A. Sure. It says what it says.

Q. Yes. So going back to your sentence, no differences in actual health effects such as those three were reported, was that an attempt to expand what Pedersen was saying, or is it meant to say the same thing as what she says in this sentence where she says only that those three health effects were evaluated?

A. Well, I'd say, yes, that's correct. The three that were reported here, obviously, showed no effect. I would imagine if there were other effects

seen, I mean, they would have been mentioned here. But I'm not trying to expand what is actually stated here. It was those three that were stated.

Q. You have no evidence that she actually looked at any other type of health effects, do you?

A. Based on what is reported here, at least in that sentence, without looking more carefully at the rest of it, no, that's correct.

Q. Well, you're welcome to look at the rest of the documents to be sure if you would like to.

A. No, I can't see the point. It says what it says.

Q. Okay.

A. I said I was not trying to expand on what it was saying. I think I used the same terms in the report. I don't understand the --

Q. Well, isn't it true your sentence would have been more accurate had you removed the words "such as"; it would have been a more accurate statement of what Pedersen found?

A. Perhaps.

Q. Since we are on page 4 of the Pedersen report, identified as UNU Exhibit 43, let me just point out another sentence in the right-hand column on that page that I believe also discusses what you

talked about earlier in your written testimony about attitude towards visual impacts of turbines. Do you see in the first paragraph on that page about two-thirds of the way down a sentence that starts with the words "Even though the study design"?

A. Yes.

Q. Okay. That sentence states, "Even though the study design did not allow conclusions as regards cause and effect (does a negative attitude lead to noise annoyance or vice versa?), this indicates the visual properties of wind turbines play an important role in how the annoyance is perceived."

Did I read that right?

A. Yes.

Q. And that's consistent with your written testimony, isn't it?

A. Yeah. I think there are two main points here. One is you can't draw causation from these kinds of cross-sectional observations. That's true throughout these surveys.

Second, there appears to be a visual component that somehow plays a role in how sounds are perceived.

Q. Now, the purpose of the paper marked UNU Exhibit 43 was to evaluate whether there was an

effect on restoration from wind turbine noise. Is that a fair characterization of what this report is generally about?

A. I believe that, indeed, is the question posed by the title, "Wind turbines - low level noise sources interfering with restoration?"

Q. Okay. But "restoration," you'll see that the author defines that term on the first page of UNU Exhibit 43 in the right-hand column, directing your attention to the first paragraph, about half the way down, starting with the words "Inhibited restoration."

A. Okay.

Q. Okay. And there it says, "Inhibited restoration or hindrance of psychological stress recovery due to disturbance from noise sources is today believed to have an important impact not only on mood but also more long term health consequences."

Did I read that right?

A. Yes. There's a citation referring to a prior work.

Q. And so by "restoration," the author is talking about the ability of a person to recover from psychological stress in one's home. Would you agree with that?

A. I believe so.

Q. Some of us more lay people would simply refer to it as unwinding at home after a hard day's work, right?

A. That's how I take it. I'm not an expert in restoration. In fact, I don't get much of it myself.

Q. The conclusion you will find on page 5 of that document where in the upper left-hand corner of the page it states, "In this article we have put forward the hypothesis, and some support for the possibility, that low and moderate stressors such as wind turbine noise could have impact on health. The risk seems to be higher if restoration is, or is perceived to be, impaired and also for certain groups of individuals. There are though many questions still to be answered before conclusions can be drawn."

Would you agree that is a fair summary of the findings of this article?

A. It's their summary.

Q. Do you agree that's what they conclude?

A. It's not really a conclusion. They're reiterating the hypothesis and suggesting they came up with some support for this hypothesis. The rest

of that paragraph points out how important it would be to do real studies and that they believe that based on their experience here, that it's feasible to do such studies, including "better measures of daily 'hassle' or daily stress in general and to study the restoration experience more closely."

I think right off the bat that it is quite fair putting their title as a question raising a hypothesis, and in this section you read they're interpreting what they found here to conclude that it would be feasible to do a proper study.

Q. Directing your attention back to page 4 of UNU Exhibit 43, the right-hand column, first paragraph, I believe you already quoted one of the sentences in this paragraph in your testimony today. I would like to pick up right after that sentence. You see a sentence starting with the words "The large impact of visual," which is about 12 or so lines from the bottom -- no, about eight lines from the bottom of that paragraph?

A. I see it.

Q. Where it says, "The large impact of visual aspects in studies as regards resistance to local wind turbine projects (Wolsink 2005) shows that not only the noise, but also the prominent appearance

of a wind turbine could be perceived as intrusive. The rotor blades of a wind turbine are furthermore almost constantly moving, attracting attention and making it difficult to ignore seeing the wind turbine. Inability to disregard visual and audible intrusion possibly adds to the impression that the environment is unsuitable for restoration."

Do you see that?

A. Yes.

Q. And that's also part of the hypothesis in this paper, is it not?

A. It is. It's in the discussion where one's opinions and interpretations and additional hypotheses should be described.

Q. Okay. Going to page 2 of that document, the right-hand column, first sentence, that sentence also indicates that this is a blind study, correct?

A. Second column?

Q. Yes, the right-hand column on page 2, first sentence.

A. Yes.

Q. All right.

A. The questionnaire was "masked to give the impression of investigating general living conditions in the countryside."

Q. Then going to page 3, there's another sentence which I believe has a bearing on your written direct testimony. In the right-hand column of that page, you see the first partial paragraph on the top of that right column on page 3?

Well, let's just start, to be fair, on the bottom of the left-hand column. The last sentence states, "Response to wind turbine noise was correlated with attitude towards wind turbines in general and with attitude towards the impact of wind turbines on the landscape scenary; i.e., annoyance with wind turbine noise was associated with a negative attitude towards wind turbines in general and towards their visual impact. When these two attitudinal variables were exposed in a linear multiple regression, also adjusting for A-weighted SPL, attitude towards the visual impact of the wind turbines was found to be strongly associated with response to wind turbine noise while the general attitude had no statistically significant impact (table 3)."

Do you see that?

A. Yes.

Q. Okay. So this study found that there was no association between general attitude towards wind

turbines and annoyance at wind turbine noise, correct?

A. That's what they're suggesting, yes.

Q. But they did find an association between a negative attitude towards the visual impacts of wind turbines and annoyance with wind turbine noise, correct?

A. That's what they say.

Q. Okay. I think you can set that document aside.

Do you find a document on your bench labeled as Company Exhibit 23, which should be another article by Pedersen? Do you have that in front of you?

A. Yes.

Q. This is also referred to as Pedersen 2007 in your written direct testimony?

A. Yes.

Q. Would you go to page 484 of Company Exhibit 23, and keeping your finger there, also go back to page 35 of your written direct testimony.

MR. SETTINERRI: What page was that, sir?

MR. VAN KLEY: Page 35 of the written direct testimony.

MR. SETTINERRI: Thank you.

Q. And I'd like to have you specifically look at the second paragraph, which is the first full paragraph on page 35 of your written direct testimony there, the middle of that paragraph with the sentence starting "Those annoyed." Tell me when you found that sentence.

A. I have.

Q. That sentence says, "Those annoyed by wind turbine noise reported a higher prevalence of sleep disturbance than those not annoyed by noise."

Did I read that right?

A. Yes.

Q. Now, going back to Pedersen 2007 marked as Company Exhibit 23, would you take a look at the right-hand column of that page under the heading "Subjective ratings of health and well-being." Just to recap here, we are looking at a sentence on page 35 of the written direct testimony, the one in the middle of the first full paragraph on that page which states, "Those annoyed by wind turbine noise reported a higher prevalence of sleep disturbance than those not annoyed by noise." Then we're also looking at page 484 of Company Exhibit 23, the right-hand column, and looking at the paragraph under the heading, "Subjective ratings of health and

well-being." Now, this is the source of your information for the sentence on page 35 on your written direct testimony that we just quoted, right?

A. At least in part.

Q. And there it is stated that "36% reported that their sleep was disturbed by a noise source, compared with 9% among those 733 not noise annoyed."

A. Right. But you are starting in the middle of the sentence. The first clause went along with that, "Of those 31 respondents who were annoyed by wind turbine noise" --

Q. Yes.

A. -- "36% of those reported that their sleep was disturbed," and so forth.

Q. Let's read the whole sentence to make sure the record is clear. It says, "Of those 31 respondents who were annoyed by wind turbine noise, 36% reported that their sleep was disturbed by a noise source, compared with 9% among those 733 not noise annoyed."

Did I read that correctly?

A. Yes, you did.

Q. Okay. So going back to your written testimony where you state, "Those annoyed by wind turbine noise reported a higher prevalence of sleep

disturbance," that refers to the 36 percent in the sentence from Company Exhibit 23 that I just quoted, right?

A. It's consistent with that, yes.

Q. Okay. And those not annoyed by noise refers to the 9 percent that is referred to in the sentence I just quoted from Company Exhibit 23; is that right?

A. Well, unfortunately, their sentence is -- has a mixed comparison. The first phrase, "Of those respondents who were annoyed by wind turbine noise," wind turbine emphasized, versus 9 percent among those not noise annoyed. So I just point out a discrepancy that it may not be an entirely fair comparison.

But I would say the spirit of your question, yes, this suggests there's a higher prevalence of sleep disturbance among those that have been identified as annoyed by wind turbine noise specifically versus general background.

Q. Now, going back to your testimony on page 35, the last sentence of that same paragraph that we've been discussing states, "Nevertheless, objectively measured sound pressure levels were not associated with any of the health effects or well-being factors evaluated."

See that sentence?

A. Yes.

Q. Go to page 481 of Company Exhibit 23. I'd like to refer you to the first sentence under the heading labeled in the left column as "Subjective variables assessed by the questionnaire," and you'll see a sentence which says, "The questionnaire consisted of questions on living conditions, reaction to possible sources of annoyance in the living environment, sensitivity to environmental factors, health and well-being."

Did I read that right?

A. Yes.

Q. Okay. Now, if you go to the second column of that same page, the last sentence of the first full paragraph reads, "Respondents were also asked about their emotions when thinking about wind turbines, their set of values of their living environment, and their status of health (chronic disease, e.g., diabetes or cardiovascular disease), well-being and sleep."

Did I read that right?

A. Yes.

Q. Now, do you see any indications in the paper as to specifically what health conditions the

respondents were asked about, other than diabetes or cardiovascular disease?

A. This is just a paraphrase of theirs, of what they had. You would have to go to their questionnaire.

Q. Did you go to their questionnaire?

A. No.

Q. Okay. So can you tell me then other than diabetes or cardiovascular disease, what other, if any, health effects the researchers for this paper inquired into?

A. It sounds like there were quite a few based on what you just read from the section on the subjective variables assessed by the questionnaire.

Q. Are you referring to the term "chronic disease"?

A. It was saying it included emotions when thinking about wind turbines, values, living environment, their status of health, chronic disease, for example, diabetes, cardiovascular. It's sort of, like, for example, or it suggests it's exemplary rather than comprehensive.

My statement, I would take you back to the first paragraph that you almost read in its entirety but not the first sentence. "A-weighted SPL

was not correlated to any of the health factors or factors of well-being asked for in the questionnaire." Whatever is in the questionnaire, they found no positive association with any of those markers.

Q. Right. But since we haven't seen the questionnaire, we don't know what diseases or health effects they were asked about, do we?

A. That's fair. Unless it was reported somewhere else in this paper or in any of the other seven papers in this group, we can't speculate.

Q. This is another study that used a blinding technique; is that right?

A. You should keep in mind it's the same study. There are three studies, two in Sweden and one in the Netherlands, and there are eight papers based on those three studies. The methods that hold for one I would hope hold for all of them.

Q. Okay.

A. I believe all three of them on which the eight papers were based attempted to mask the intention of the survey.

Q. Okay, very good. Now, the conclusion of the study is summarized in the abstract on the front page, right?

A. There is a conclusion section in the abstract, yes.

Q. And it says, "There is a need to take the unique environment into account when planning a new wind farm so that adverse health effects are avoided. The influence of area-related factors should also be considered in future community noise research."

That is the conclusion that the researchers made, right?

A. It's a bit more of an opinion than a conclusion of their study.

Q. Directing your attention to page 483 of Company Exhibit 23, and then also comparing that to your written direct testimony on the bottom of page 34 and the top of page 35, here on your direct testimony you're referring to the Pedersen 2004 paper, correct?

A. Yes.

Q. Okay.

A. We recited this a few minutes ago.

Q. And we already have talked about the authors in that paper finding that the risk of annoyance from wind turbine noise exposure increased significantly with each increase of 2.5 dBA.

Let me point you to another statement on

page 483 of Pedersen 2007, which is marked as Company Exhibit 23. Look at the right-hand column of that page, the last paragraph where it states, "Table 22 shows the association between SPL and perception of noise from wind turbines; the odds of noticing sound increased by 30% for each dB(A) increase."

Do you see that?

A. Yes.

Q. And that's not inconsistent with what you were saying on pages 34 and 35 of your written direct testimony, is it?

A. It is.

Q. It is inconsistent?

A. It's a different measure.

Q. Pardon?

A. It's a different measure.

Q. They talk about different things?

A. The papers are full of language on perception versus annoyance. You just combined the two.

Q. Okay. So what you're saying, I should not compare those two sentences, that they are talking about something different.

A. There is a threshold upon which they begin to hear it, they think. That's a subjective

determination. The other was the point at which or dose-response describing a modeled annoyance relationship with sound.

Q. Okay.

A. They're completely different.

Q. Fair enough. You can set that paper aside. Go back to your written testimony on page 34. Earlier you stated that perhaps one of the sentences at the bottom of this page came out of another Pedersen paper, talking about the sentence that reads, "Despite the association between increased sound pressure levels and greater annoyance from wind turbine noise, no differences in health or well-being outcomes, (e.g., tinnitus, cardiovascular disease, headaches, irritability) were observed."

Based on the other papers we have gone through in this testimony so far or any other Pedersen papers within your knowledge, can you tell me whether you believe any of those papers support the statement in your written testimony that I've just quoted?

A. Yeah, I'm pretty certain it does. It is misquoted, but I don't recall which of the others might have produced that.

Q. None of the papers we have gone through

today have that information, do they?

A. I don't recall.

Q. If you need to look at those papers, feel free to do so.

A. You are saying the three we already looked at?

Q. Well, whatever documents you think has this information in it, you are free to look at, whether it's anything I've given you or any references you took with you to the stand today. I noticed you took a stack of papers with you today. You're free to look at any of that information and tell me whether any of those documents support that statement.

A. I can't offhand place that statement.

Q. All right. Let's move on then. Let's go to page 37 of your direct testimony.

MR. VAN KLEY: Your Honor, may I approach the witness?

ALJ TAUBER: You may.

MR. VAN KLEY: Your Honor, I would like to mark this as UNU Exhibit 44.

ALJ TAUBER: So marked.

(EXHIBIT MARKED FOR IDENTIFICATION.)

Q. Do you recognize UNU Exhibit 44 as the

Janssen 2011 study that you cited on page 37 of your direct testimony?

A. Yes.

Q. Would you go to page 3751 of Exhibit 44. Under the heading Discussion, the first part of that paragraph under the heading of Discussion states, "The present study shows that in comparison to other sources of noise, annoyance due to wind turbine noise is found at relatively low noise exposure levels. In the overlapping exposure range, the percentage of annoyed persons indoors by wind turbine noise is higher than that due to other stationary sources of industrial noise and also increases faster with increasing noise levels. Furthermore, the expected percentage of annoyed or highly annoyed persons due to wind turbine noise across the exposure range resembles the expected percentages due to each of the three modes of transportation at much higher exposure levels."

Did I read that right?

A. Yes.

Q. Now, going to your testimony on page 37, that is page 37 of your direct testimony, I'd like to clarify some of the statements you've made in the second paragraph on that page. In the third sentence

of that paragraph you state, "The authors compared their modeled results with other modeled relationships for industrial and transportation noise claiming that annoyance from wind turbine noise is higher than annoyance from other noise sources (in the overlapping noise range, >45 dB(A) (Janssen 2011), which indicates that there are likely other factors than just sound pressure that influence reporting of annoyance, as the sound pressures were the same."

Now, the overlapping noise range to which you refer on page 37 of your written testimony is also referred to in the paragraph under Discussion on page 3751 of UNU Exhibit 44, correct?

A. Yes.

Q. And according to this paragraph, the authors of the study found that wind turbine noise became annoying to people at lower levels than noise from the other industrial sources they reviewed. Is that correct?

A. That's generally true, yes.

Q. Okay. Then there was a noise level for both wind turbine and the other industrial sources they analyzed in which the respondents stated that they were more annoyed by the same levels of noise

from the wind turbines than they were from the other industrial sources. Did I state that fairly?

A. Yes.

Q. Now, you stated in your testimony that there's an indication "there are likely other factors than just sound pressure influencing reporting of annoyance as the sound pressures were the same."

Let me refer you to another part of that study on page 3752. In the left-hand column and in the first full paragraph, I'd like to direct your attention to a sentence that appears after the citation from Miedema and Vos.

A. All right.

Q. And that sentence says, "Also, visibility from the home (e.g., living room, bedroom) has been reported earlier to affect annoyance from stationary sources Miedema and Vos, 2004) and may exert its influence in different ways such as visual intrusion, increased salience, or enhanced identification of the source of the noise."

Now, that could be one of the factors other than just sound pressure that influence the reporting of annoyance; is that right?

A. Sure.

Q. Okay. Moving down further on that same

column, look at the last sentence of that same paragraph, which states, "Hence response to wind turbine noise is influenced by similar situational and individual factors of which the strong influence of visibility on annoyance due to wind turbine noise may partly explain the unexpectedly high annoyance percentages."

Did I read that right?

A. Yes.

Q. And that essentially says the same thing as the prior sentence I read, right?

A. Yes.

Q. And moving further down on that column, the next sentence says, "Another factor that could possibly explain part of the relatively large noise response is the sound character of wind turbine noise. The noise is emitted from a level above the receiver, actually at several heights as the main source is the turbulence around the rotor blades at the outer part (Oerlemans, et al., 2007); for modern wind turbines typically varying between 50 and 130 meters over the ground as the rotor blades move. This gives an amplitude modulated sound, for example, with an amplitude of 5 dB (van den Berg 2009) and a modulation frequency of 0.5-1 Hz. The sound power

levels depend on the wind velocity, meaning that the immission levels also vary irregularly and unpredictably. Amplitude modulated sound is known to be easily perceived."

Did I read all that correctly?

A. Yes.

Q. Okay. And the last sentence of that paragraph, "This means that wind turbine sound may particularly be heard in otherwise quiet areas, where people do not expect to hear industrial noise."

Do you see that?

A. Yes.

Q. So the topics of the sentences that I've just read are other factors that could possibly explain the higher annoyance of wind turbine at the same decibel levels as the noise from the other industrial sources that were analyzed in this report, correct?

A. They do raise those as possibilities.

Q. Then you see the next sentence of that same column on page 3752 of Exhibit 44. It states, "Furthermore, the mostly rural position of wind turbines may contribute to the heightened annoyance response."

Did I read that right?

A. Yes.

Q. So that's another factor that the authors postulate may increase the annoyance from the wind turbines, correct?

A. You read it.

Q. You can set that one aside.

MR. VAN KLEY: May I approach the witness, your Honor?

ALJ TAUBER: You may.

MR. VAN KLEY: I'd like to mark the next exhibit as UNU Exhibit 45.

ALJ TAUBER: The exhibit is so marked.

(EXHIBIT MARKED FOR IDENTIFICATION.)

Q. Exhibit 45 is the report that you refer to at the bottom of page 37 of your written direct testimony as Shepherd, et al, 2011, correct?

A. Yes.

Q. Please go to page 336 of UNU Exhibit 45 -- I'm sorry, that's the wrong page. Go to page 337. I'd like to direct your attention to the right-hand column, specifically the second full paragraph in that column, and I'd like you to look at the third sentence, which states, "It should be noted that, in contemporary medicine, annoyance exists as a precise technical term describing a mental state

characterized by distress and aversion, which if maintained, can lead to a deterioration of health and well-being."

Did I read that right?

A. Yes.

Q. Okay. Now, earlier I think you indicated that you weren't sure in your own mind as to how to define annoyance. Do you agree that this is a reasonable definition of the term "annoyance"?

A. Well, it's Shepherd. See at the end of the sentence you read? He cites himself, so he's invented and now cites it as -- how did he say? That it's a precise technical term. So I'm just noting that he's not citing the World Health Organization dictionary or anything else. It's his own invention. Now we can look at it for what it's worth.

Q. Well, he also indicates this is how the term is regarded in contemporary medicine, does he not?

A. Citing himself. If he's contemporary medicine, then that's fair. It might be. I would say because this is not a mainstream reference and I was unable to find the medical definition of annoyance, other than what we would understand as lay people, I can't say one way or the other whether this

is a professional improvement over what I may state as a layperson.

Q. Would you go to page 338 of the Shepherd report, which is labeled as UNU Exhibit 45. Look at the left-hand column on that page, specifically the second full paragraph where it is stated, "Another finding emerging from our data is that living close to wind turbines is associated with degraded amenity. This is consistent with previous research showing that wind turbine noise was judged incongruent with the natural soundscape of the area. Amenity values are based upon what people feel about an area, its pleasantness, or some other value that makes it a desirable place to live. There is an expectation of 'peace and quiet' when living in a rural area, and most choose to live in rural areas for this reason."

Do you see that?

A. Yes.

Q. I read that correctly?

A. Yes.

Q. So that is one of the findings of Shepherd's paper with regard to his evaluation of the impact of wind turbine noise on the quality of life of people living nearby. Is that correct?

A. That's what he says. He also cites

himself again on that statement. But it's not my area of expertise. I'm an epidemiologist.

Q. All right. Then if you go back to the first page of his report, which is page 333, you'll see that he has an abstract there, and the last two sentences refer to HRQOL, which is defined as health-related quality of life. Do you see that?

A. I'm following.

Q. Okay. And it's stated there -- actually, the last three sentences. It states, "Statistically significant differences were noted in some HRQOL domain scores with residents living within 2 km of a turbine installation reporting lower overall quality of life, physical quality of life, and environmental quality of life. Those exposed to turbine noise also reported significantly lower sleep quality, and rated their environment as less restful. Our data suggest that wind farm noise can negatively impact facets of HRQOL."

Did I read that right?

A. Yes.

Q. And that was the conclusion of the report, was it not?

A. Yes.

Q. You can set that document aside.

A. I would note, however, that they have no exposure measures and they had a miserable response rate. Only one-third of the people that they approached actually participated.

Q. When you talk about "no exposure levels," you're talking about whether they actually measured the noise levels at the time they --

A. At any time.

Q. Instead, this report measured the quality of life or measured responses from the respondents based on distance from the turbines, correct?

A. Yes, once again.

Q. Okay. Let's go back to your testimony on page 38. The last sentence states, "The only epidemiological studies directly assessing audible wind turbine noise lead to the conclusion that self-reported annoyance is highly correlated to a negative attitude toward wind turbines."

Do you see that?

A. Yes.

Q. And what you're actually meaning there is that annoyance at wind turbine noise is highly correlated to a negative attitude about the visual impact of wind turbines, correct?

A. A visual component is a strong one, yes.

Q. We already established through at least one of the other studies that we reviewed in today's testimony that there has been no correlation found between annoyance and general attitude towards wind turbines, have we not?

A. That study came to that -- or presented that finding, yes.

Q. Okay. So looking at your conclusion then, which you stated in various ways throughout your written testimony, is it your conclusion then that wind turbines do not cause health effects, that is, wind turbines do not cause health problems, or that there has not been a proper epidemiological study or studies proving that wind turbines cause health problems?

A. Well, as an epidemiologist, I need epidemiological evidence of a causal association before I can draw that conclusion. If we don't have that affirmative evidence, then it's invalid to draw that conclusion. It doesn't mean that it can prove the negative. I think we went through that in great detail earlier.

Q. Yes. Now, sleep deprivation can cause health problems, can't it?

A. Yes. And when people are -- people have

any of these things in their extreme, can be seen and have been experienced by us all as influencing our health and well-being.

Q. And, in fact, restricting sleep below an individual's optimal time in bed can cause a range of neurobehavioral deficits, including lapses in attention, slowed working memory, reduced cognitive throughput, depressed mood, and perseveration of thought, correct?

A. I've not evaluated that. It seems plausible, but I'm not going to testify to that as being a product of my research.

Q. Okay. You remember testifying in Buckeye I in Ohio, right?

A. Yes.

Q. And do you recall testifying in response to that same question where you stated that it was, correct?

A. I'm sorry, you lost me.

Q. Let me show it to you to be fair.

MR. VAN KLEY: Your Honors, we would like to mark this as UNU Exhibit 46.

ALJ CHILES: So marked.

(EXHIBIT MARKED FOR IDENTIFICATION.)

Q. As you see, this is some pages from the

transcript from the hearing in Buckeye I, correct?

A. Yes.

Q. Would you go to page 472, and go to line 6 where the question is asked of you, "Now, just skipping the next sentence and go to the third sentence where it says, "Restricting sleep below an individual's optimal time in bed can cause a range of neurobehavioral deficits, including lapses of attention, slowed working memory, reduced cognitive throughput, depressed mood, and preservation of thought.

"Do you agree with that sentence?

"Answer: "Didn't say 'preservation.'

"Question: "'Perseveration of thought,' my apologies."

I made the same mistake.

A. Three strikes you're out.

Q. And then you said, "Yes, that's correct." Do you see that?

A. Yes, that is correct that you read it.

Q. Well, the question was, do you agree with that sentence?

MR. SETTINERRI: I'd like to note to let the witness finish his answer before he is cut off.

A. I thought that you might have culled that

out, but I think the distraction of the mispronunciation, deja vu. Then my answer said, yes, that it's correct that you corrected the mispronunciation.

Then you say, "That sentence is expressed in terms of causation, is it not? Where it says it can cause a range of these things?

"That's right. It's the word that they use."

I think in all fairness to the interpretation of this is that I was agreeing with your correction of the perseveration and then agreeing that you had read that in terms of causation.

Q. All right.

A. Not my opinion.

Q. Well, let me ask you this. Do you agree that "Neurobehavioral deficits accumulate during days of partial sleep loss to levels equivalent to those found after one to three nights of total sleep loss"?

A. Again, it's not my area of expertise, but I have no reason to disagree with it. I think what I stated -- I'm sorry, no. "I have no reason to doubt that."

Q. And do you agree that "Recent experiments

reveal that following days of chronic restriction of sleep duration below seven hours per night significant daytime cognitive dysfunction accumulates at levels comparable to that found after severe acute total sleep deprivation"?

A. I think the record is crystal clear. I said even then and say it again, that's their conclusion from their review of the literature.

Q. You have no reason to doubt it, do you?

A. Well, I have had no reason to evaluate it. I might doubt it if I evaluated.

MR. SETTINERRI: At this time for the record I'll just note there was no identification of what sentences have been lifted from an article read into the prior record from 08-666, where those sentences are coming from.

ALJ TAUBER: We'll note that for the record.

Q. With respect to your point that you don't believe there have been sufficient epidemiological studies to show that wind turbines cause health problems, are you stating that given the state of your knowledge, that you can opine that wind turbine noise or wind turbines generally do not cause negative health effects?

A. We have covered that on a number of occasions throughout the afternoon. It all comes down to principles of scientific method. Until there's affirmative and good quality evidence that there are causal effects, it's inappropriate to conclude that there are.

Q. Isn't that the same argument that was made for decades by tobacco companies, who claimed there were no demonstrated adverse health effects caused by smoking tobacco that had been evaluated in the epidemiological studies?

A. I'm not exactly sure that was the conclusion drawn. There were certainly questions raised about the validity of the scientific evidence that was published in an open literature for decades on which public health officials, including the US Surgeon General in the Report to the Surgeon General in 1964, concluded that smoking caused lung cancer.

It is really irrelevant what the tobacco industry thought at the time when you had authoritative conclusion based on good epidemiologic science.

Q. Even then tobacco companies claimed there was no valid epidemiological science showing that tobacco smoking caused health problems; isn't that

right?

A. I don't think that's accurate. No, it was more complicated than that. There were challenges made to some of the conclusions, obviously wrong, but, again, what authority does the tobacco industry have on the science of tobacco smoking when they never connected a study.

MR. VAN KLEY: Can I approach the witness with UNU Exhibit 46, your Honor?

ALJ TAUBER: You may.

ALJ CHILES: I believe it is Exhibit 47. The deposition is Exhibit 46.

MR. VAN KLEY: Thank you.

(EXHIBIT MARKED FOR IDENTIFICATION.)

Q. Now, you testified about this document in the first hearing on Buckeye Wind I, did you not?

A. I don't recall. Is it in this same exhibit?

Q. Well, yes. You will see it referred to in Exhibit 46 at the very end where it states, "I'm going to hand you what has been marked Exhibit 52."

MR. SETTINERRI: Do you have a page number, please?

MR. VAN KLEY: It's page 549 of UNU Exhibit 46.

Q. Let me just hand you the entire transcript so you can see the next page as well. I am handing you the next four pages of the transcript. I only have one copy with me.

Would you look down those pages and tell me whether you see that Exhibit 52 in the Buckeye Wind I proceeding is the same document that has been marked now as UNU Exhibit 47 as shown by the quoted material from that document?

MR. SETTINERRI: What pages of the deposition transcript are we looking at?

MR. VAN KLEY: This is in the hearing transcript, pages 550, 551, maybe 552.

MR. SETTINERRI: Which pages have been given to the witness?

MR. VAN KLEY: 550 through 553.

MR. SETTINERRI: Thank you.

A. I'm sorry, I lost track of your question. Do you know where this came from or what year it was published?

Q. Well, I don't know, but you recognized it the first time around.

A. It's famous. I don't remember when it was published.

Q. All right. I don't think it's important

to know when it was published for purposes of answering my questions, but you did recognize that document when you testified in Buckeye Wind I, did you not?

A. Yes.

Q. Okay.

A. I think so. I mean, I recognize that you gave it to me and asked me questions about it. I don't know if I said anything specific here that I was familiar with it.

Q. Now, if you look at UNU Exhibit 47 --

A. I said it's not on wind turbines.

MR. SETTINERRI: At that time I had objected, which is in the transcript, and the objection was sustained as not being related to the proceeding as it relates to the tobacco industry.

We are going down the same path again. It is a document with no publication date, no authentication, so I move that the line of questioning not be permitted on this document, UNU Exhibit 47.

ALJ CHILES: Mr. Van Kley.

MR. VAN KLEY: What page of the transcript are you looking at?

MR. SETTINERRI: Page 553, "ALJ SEE: The

objection is sustained."

For the Bench, I presented my objections verbally.

MR. VAN KLEY: Well, he was asked, and I was allowed to ask several questions about this document before Mr. Settineri's objection cut me off. I'd like to ask him just a couple of questions about this and link it to the general principle that I started to develop.

ALJ TAUBER: I'm not sure there's an outstanding question now, so I'll allow the question, and then if there is an objection raised, I will address that and have arguments.

Q. (By Mr. Van Kley) I believe we kind of lost track where we were in your questioning, so let me backtrack a little bit. I had asked you some questions about whether the tobacco industry had, despite the existence of epidemiological studies, still claimed that there was no proof that tobacco smoking caused adverse health effects.

I've just handed you what has been marked as UNU Exhibit 47 in which you will note that the title is "A Frank Statement to Cigarette Smokers," and you'll see at the bottom there is cited Tobacco Industry Research Committee and a number of sponsors

that are some tobacco companies.

Then you will see in the text of the document where it says on the top, "Recent reports on experiments with mice have given wide publicity to a theory that cigarette smoking is in some way linked with lung cancer in human beings."

And then three paragraphs down you'll see where it says "Distinguished authorities point out.

"1. That medical research of recent years indicates many possible causes of lung cancer.

"2. That there is no agreement among the authorities regarding what the cause is.

"3. That there is no proof that cigarette smoking is one of the causes.

"4. That statistics purporting to link cigarette smoking with the disease could apply with equal force to any one of many other aspects of modern life. Indeed, the validity of the statistics themselves is questioned by numerous scientists."

Did I read that correctly?

A. Yes.

Q. Now, are you familiar with a statement like this that was provided by tobacco companies in 1954?

MR. SETTINERRI: At this time I'm going

to object on the grounds of the basis of relevancy. This is an application for a wind turbine facility in this proceeding. The studies Dr. Mundt testified on today, his testimony is on studies that relate to wind turbines. We are now going into the tobacco industry, which is not relevant. Those studies are not relevant to this proceeding.

ALJ TAUBER: Mr. Van Kley.

MR. VAN KLEY: Yes, your Honor. They are directly relevant. This witness is claiming simply by virtue of the fact that he dismisses the existing studies on the health effects of wind turbines that, therefore, there's no proof that wind turbines cause health problems.

I am showing him this statement to demonstrate that exactly the same argument was made a long time ago by tobacco companies, which I am sure this witness will say is inaccurate; that is, he will admit that tobacco smoking does cause health problems, and that is exactly the same ploy that the tobacco industry used for many years, in fact, many decades, to do the same thing that Champaign Wind is trying to do in this proceeding today. So it is directly relevant to the credibility of epidemiology with respect to this question.

ALJ TAUBER: Before we rule on that, I would like to point out there was some discussion earlier about what the past administrative law judges ruled on, and that has no relevance to what is before us in this proceeding, however they ruled one way or the other.

Having said that, at this point we will sustain the objection. I think we've drifted a little bit away from what the focus is.

MR. VAN KLEY: Then I have no further questions.

ALJ TAUBER: Thank you.

Mr. Margard.

MR. MARGARD: May I have a moment, your Honor.

ALJ TAUBER: Sure.

(Discussion off record.)

ALJ TAUBER: Back on the record.

MR. MARGARD: No questions. Thank you.

ALJ TAUBER: Thank you, Mr. Margard.

Mr. Settineri, redirect.

MR. SETTINERRI: Thank you, your Honor.

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REDIRECT EXAMINATION

By Mr. Settinerri:

Q. If you could turn to UNU 42, the Pedersen 2004 study.

A. I have it.

Q. Do you recall being asked a question on page 34 of your testimony about the sentence that reads, "Despite the association between increased sound pressure levels and greater annoyance from wind turbine noise, no differences in health or well-being outcomes, (e.g., tinnitus, cardiovascular disease, headaches, irritability) were observed."

Do you recall questions about the origin of that sentence?

A. Yes.

Q. Start first on UNU 42, if you would turn to page 3462 for me, the right-hand column, first full paragraph. The right-hand column of 3462, first full paragraph starts, "The third section of the questionnaire concerned health aspects such as chronic illness, diabetes, cardiovascular disease, hearing impairment, and general well-being (headache, undue tiredness, pain and stiffness in back, neck, or shoulders, feeling tense/stressed, irritable). Do you see that sentence?

A. Yes.

Q. So am I correct that the questionnaire

did concern questions related to health aspects, correct?

A. Yes.

Q. If you turn to page 3464, starting at the bottom of the left-hand column, starting with the word "No," 3464, again, UNU Exhibit 42, you see the sentence "No statistically significant differences in variables related to noise sensitivity, attitude, or health were found between the different sound categories."

A. Yes.

Q. Having seen what I have just read from UNU Exhibit 42, does that help you identify the source of your statement on page 34 that you just read previously?

A. Yes. Thank you.

Q. And for the record, that would be UNU Exhibit 42 of the Pedersen 2004 study, correct?

A. Yes. The reference is indeed correct. Thank you.

Q. Turning to UNU Exhibit 43, do you recall being asked questions regarding page 2 of this exhibit, which is the Pedersen published in 2008 article titled "Wind turbines - low level noise sources interfering with restoration?"

Do you recall the questions related to the masking of the questionnaire?

A. Yes.

Q. If you look at the right-hand column on page 2, half middle of the first full paragraph, there is a sentence that reads as follows: "The subjects were also asked which of following terms they thought described wind turbines: efficient, inefficient, environmentally friendly, harmful to the environment, unnecessary, necessary, ugly, beautiful, inviting, threatening, unnatural, annoying, blends in."

Do you see that sentence?

A. Yes.

Q. Am I correct that their questionnaire did have specific questions related to wind turbines?

A. Yes.

MR. SETTINERRI: No further questions, your Honors.

ALJ TAUBER: Recross, Ms. Parcels.

MS. PARCELS: Very briefly.

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RECROSS-EXAMINATION

By Ms. Parcels:

Q. Mr. Settineri asked you about your direct

testimony on page 34, your response to question 29, and you indicate that you don't believe that there is any convincing and consistent evidence to support the claim that noise from wind turbines causes adverse health effects.

You're an epidemiologist, not an attorney, correct?

A. Thankfully, yes, no offense to the attorneys.

Q. Do you believe, in your opinion as an epidemiologist, evidence has a different definition than what a legal definition would be to a lawyer --

A. That's correct.

Q. -- of evidence?

A. That's correct. We do use the same term "weight of evidence," and it's a similar approach. Taking all things into consideration, some forms of scientific evidence carry more weight than others, and when that's synthesized, it literally either satisfies or falls short of supporting a cause -- a conclusion of causation.

Q. Again, I understand that you're not an attorney, but would you agree that you evaluate evidence and make your conclusions based on a reasonable degree of scientific certainty?

A. That's right.

Q. Okay.

A. We actually have a higher standard than that in weighing evidence.

Q. What is that higher standard?

A. Well, a reasonable degree, I think there's been some attempts to quantify that. I think it's a simple preponderance, but a scientific standard has statistical significance. You hear that term often in discussing scientific papers. It's set at a 95 percent level rather than a 50 percent level.

Q. You did use the term "preponderance." I was going to ask you what your understanding is of the term "preponderance of the evidence"?

A. We don't use that term but --

Q. But attorneys do. I understand you are not an attorney.

A. I think you can relate to it, and I understand the definition well enough that we communicated.

Q. Okay. So would your understanding of a preponderance of the evidence, just from your perspective as an epidemiologist, be just a little bit greater than 50 percent?

MR. SETTINERRI: I object, outside the

scope of redirect.

MS. PARCELS: He addressed in the redirect in response to question 29, and I'm trying to pin down that convincing or consistent evidence phraseology.

ALJ CHILES: I agree at this point we have gone beyond the scope of recross. I will sustain the objection.

Q. Dr. Mundt, you also indicated that you had some dispute with a quote attributed to -- I can't even really say it was a quote -- the Houston Chronicle article that you did not believe that the reporter was accurate in what they communicated in the article. Why wouldn't you have requested a correction if you don't believe that you said what the reporter attributed to you?

MR. SETTINERRI: Object, beyond the scope of redirect.

ALJ TAUBER: Ms. Parcels, do you care to respond?

MS. PARCELS: I believe that goes to his credibility.

ALJ CHILES: I will sustain the objection.

MS. PARCELS: Nothing further.

ALJ TAUBER: Ms. Napier.

MS. NAPIER: The county has no recross.

ALJ TAUBER: Mr. Van Kley.

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RECROSS-EXAMINATION

By Mr. Van Kley:

Q. With respect to your observations about the health findings of UNU Exhibit 42, it's true, isn't it, that findings from one study are not adequate to disprove that wind turbines cause adverse health effects?

A. I'm sorry, it's not possible to answer the question. You're assuming they do, and I've repeatedly tried to help the Court understand how science and scientific evidence is used in decision-making, and that it is the accumulation of affirmative evidence that causes one to reject the null hypothesis, that of being no association, that leads to at some point a sufficient quantity and consistency of that evidence to allow a valid step to the next judgment of a causal conclusion.

Q. And it takes more than one study to come to that conclusion, doesn't it?

A. We've covered that as well, yes.

Q. Pardon?

A. We have covered that as well. I recall specifically a question you asked me that causation cannot be based on a single study.

MR. VAN KLEY: Thank you. No further questions.

ALJ TAUBER: Staff.

MR. MARGARD: No, thank you, your Honor.

ALJ CHILES: I have no further questions. You are excused. Thank you.

THE WITNESS: Thank you.

ALJ CHILES: Mr. Settineri.

MR. SETTINERRI: Thank you, your Honor. At this time the company moves to admit Company Exhibit 29, the Rebuttal Testimony of Kenneth A. Mundt into the record.

ALJ CHILES: Any objection to the admission of Company Exhibit 29?

MR. VAN KLEY: No.

ALJ CHILES: Hearing none, Company Exhibit 29 will be admitted.

(EXHIBIT ADMITTED INTO EVIDENCE.)

ALJ CHILES: Mr. Van Kley.

MR. VAN KLEY: Let me just check what I did.

I don't think we are offering any of

ours, your Honor.

ALJ CHILES: Thank you.

Anything further to come before us today? We will talk about briefing schedules. Anything before we talk about that?

MR. VAN KLEY: I have one more housekeeping motion that I'd like to raise before we go off the record.

Now that the evidentiary part of this proceeding has concluded, I think it's time to revisit the earlier decision by the Bench to admit all of the Application into evidence. Several parties indicated, including us, towards the beginning of the case that we thought at that time it was premature to admit the entirety of the Application into evidence because the witnesses who were supposed to testify in support of the information in the Application had not yet testified.

Now they have testified, and we believe that it is time for the Bench to reconsider the admission of at least some of the Application that has been submitted.

In particular, we would note that the information in the Application about ice throw, blade shear, and shadow flicker were not properly supported

by witnesses with personal knowledge concerning how that information had been obtained. The witnesses relied solely on hearsay to support their statements as well as to support their statements that the information in the Application was accurate.

So we believe that at this time it would be appropriate for the Board to strike those provisions of the Application since they have not properly been submitted and supported by the evidence in the case.

ALJ TAUBER: Those provisions represented by ice throw, blade shear, and shadow flicker?

MR. VAN KLEY: That's correct, your Honor.

MS. NAPIER: Yes, as counsel for UNU has brought this up, we would certainly like to renew our motion to strike the exhibits that we had previously also set forth when the Application had first come up for admission.

ALJ CHILES: Can you tell us what those exhibits are?

MS. NAPIER: One is E.

ALJ CHILES: Ms. Nappier, would you like to make a motion to strike as to specific subject matters, as Mr. Van Kley has, rather than referring

to specific exhibits?

MS. NAPIER: I believe the transportation, specifically that would be E, and Exhibit G, the economic impact.

MR. VAN KLEY: And we would also join that portion of the county's motion.

MS. PARCELS: The city would join on Exhibit G, the economic impact assessment, as well as part of Exhibit F relating to groundwater, but not the surface water.

ALJ CHILES: Only the portion of Exhibit F relating to groundwater?

MS. PARCELS: Yes, that Mr. Rostofer testified he was unable to speak to, and Mr. Crowell, he was unable to speak to it, too.

ALJ CHILES: Thank you for that clarification. Is that the entirety of the motion to strike?

Mr. Settineri.

MR. SETTINERRI: Yes, your Honor. The Application has already been admitted into evidence. These are motions for reconsideration that should be denied. We have had a number of the company witnesses. Mr. Speerschneider, Mr. Shears provided detailed testimony. Mr. Speerschneider provided

detailed testimony on shadow flicker, the ice throw, the controls around turbines. In addition to blade throw, Mr. Robert Poore as well as Mr. Shears testified to their personal experience on the rarity of blade throw.

As to the remainder of the exhibits, Mr. Crowell gave testimony on the exhibits, and it is a long-standing tradition of the Board to allow sponsorship of an Application

These motions for reconsideration should be denied as the initial motions to strike were denied.

MR. VAN KLEY: For clarification, your Honor, you can call our motions, motions for reconsideration or motions to strike. I don't care what we call them. Nomenclature aside, I would characterize our motions as both, I guess, to cover all my bases.

MS. NAPIER: We would concur. And I think, frankly, we have been, at least for the last two weeks, ruling on exhibits based on the rules of evidence, and I don't believe that in the rules of evidence it allows an expert who does not have expertise in the specific topic that we have discussed.

And I believe for at least the two exhibits that the county has addressed, Exhibit G and Exhibit E, the people who have testified on those have shown, one, as Mr. Crowell, he did not testify that he was a keeper of the records. He testified that he had no expertise as an engineer. Frankly, I think calling him a sponsor basically just means he isn't an expert, and I think he needs to be an expert to actually talk about what is set forth in the transportation routes survey.

MS. PARCELS: The city would join that with relation to the groundwater, which he testified he did not qualify and someone else did that study.

ALJ CHILES: Mr. Settineri, do you care to respond?

MR. SETTINERRI: Well, the arguments as to that motion to strike were made a week and a half ago and remain as made at that time. Mr. Crowell presented the studies that his firm performed. At the time he testified, the Application was already in the record.

Mr. Speerschneider also presented testimony as well on the entire Application, so, again, we stand by our arguments as previously made. The Application has been admitted into evidence. We

have provided sufficient witnesses to allow cross-examination, and the motions for reconsideration should be denied

ALJ CHILES: The motions to strike and/or the motions for reconsideration are noted for the record; however, they are denied consistent with the Bench's prior ruling.

Any other motions to come before us?

With that, we will discuss our briefing schedule on the record. The Bench has determined that initial briefs will be due on January 16 and that reply briefs will be due on January 28. That was January 16 for initial briefs and January 28 for replies.

The Bench would also be putting page limits on briefs. The page limits are 75 pages for initial briefs and 50 pages for reply briefs.

MS. NAPIER: Is that excluding any appendix or exhibits, attachments other than the text?

MR. VAN KLEY: Yes. But with that notation, we are also requesting that the briefs contain no procedural history. We have been here for three weeks. We know what has gone on. I'm sure you don't want to revisit it in your briefs either.

That was 75 for initials, excluding appendices and attachments, and 50 for reply briefs.

MR. VAN KLEY: Does that exclude the certificate of service and the signature block?

ALJ CHILES: I suppose it's been quite long here.

Anything further to come before us?

MR. VAN KLEY: Did you say yes or no to that question?

ALJ CHILES: Yes, we will exclude the certificate of service.

MR. VAN KLEY: Okay.

ALJ CHILES: All right. If there is nothing further to come before us, we are finally adjourned. Thank you.

(The hearing adjourned at 7:10 p.m.)

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CERTIFICATE

I do hereby certify that the foregoing is a true and correct transcript of the proceedings taken by me in this matter on Thursday, December 6, 2012, and carefully compared with my original stenographic notes.

_____

Rosemary Foster Anderson,
Professional Reporter and
Notary Public in and for
the State of Ohio.

My commission expires April 5, 2014.

(RFA-8858)

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Summary: Transcript of Champaign Wind, LLC hearing held on 12/06/12 - Volume XII electronically filed by Mrs. Jennifer Duffer on behalf of Armstrong & Okey, Inc. and Anderson, Rosemary Foster Mrs.