STATE OF WEST VIRGINIA

AIR QUALITY BOARD

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TUCKER UNITED, WEST VIRGINIA	*	
HIGHLANDS CONSERVANCY, and	*	Appeal No.
SIERRA CLUB,	*	25-02-AQB
Appellants	*	
vs.	*	
DIRECTOR, DIVISION OF AIR	*	
QUALITY, DEPARTMENT OF	*	
ENVIRONMENTAL PROTECTION,	*	
Appellee	*	
and	*	
FUNDAMENTAL DATA, LLC,	*	
Permittee/Intervenor	*	

* * * * * * * * *

BEFORE: J. MICHAEL KOON, Chair
Grant Bishop, Member
Robert C. Orndorff, Member
R. Thomas Hansen, Member
Leonard Knee, Member

HEARING: Wednesday, December 3, 2025

8:58 a.m.

LOCATION: WV Department of Environmental Protection

601 57th Street, Southeast

Charleston, WV 25304

WITNESSES: James Kotcon, Amy Margolies, Marilyn Shoenfeld, Alan Tomson, Ranajit Sahu

Reporter: Chassidy E. Bays

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KENNA M. DERAIMO

I N D E X

I N D E X (cont.)

I N D E X (cont.)

I N D E X (cont.)

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P R O C E E D I N G S

COURT REPORTER: Do you want the same transcript preferences that I emailed you about after the first part?

ATTORNEY YAUSSY: Yeah, I mean, you're. We may break out the transcripts. There --- there --- there may be a confidential or -

COURT REPORTER: Okay.

ATTORNEY YAUSSY: - transcript. So I guess we would want the same for both.

COURT REPORTER: Okay.

ATTORNEY YAUSSY: Yeah. Yeah.

COURT REPORTER: Because I, I'll go through my notes really quick. I think you just wanted an email copy?

ATTORNEY YAUSSY: Yeah, I think that --- that was it. Oh, that may --- may change around if we do want a confidential. I don't know.

COURT REPORTER: Okay.

ATTORNEY YAUSSY: Yeah.

COURT REPORTER: Well, I will actually. I already have all of your.

ATTORNEY YAUSSY: You have all the

information already?

COURT REPORTER: Contact information. But I will give you this, and if it changes or you want it or something and you can keep it with you. Just to be safe.

ATTORNEY YAUSSY: That'd be great.

COURT REPORTER: Awesome. Michael. I tried to --- I put email, did not reply. So I forgot to give this after our first hearing.

ATTORNEY BECHER: Yeah.

COURT REPORTER: To know transcript preferences for that first one. So this would have count for this hearing.

ATTORNEY BECHER: Okay, yeah.

COURT REPORTER: And if you want the last one, if you didn't get any contact, if you make a note, I can let them know.

ATTORNEY BECHER: Okay, great.

(WHEREUPON, AN OFF RECORD DISCUSSION WAS HELD DURING THE PROCEEDING.)

CHAIR: All right.

Let's come to order, please. I'm Mike Koon. I'm the Chairman of the Air Quality Board, and

members of the Board sitting to my right here, I'm going to ask each one of them to introduce themselves first of all.

MR. HANSEN: I'm Tom Hansen.

MR. BISHOP: Grant Bishop.

MR. ORNDORFF: Bob Orndorff.

CHAIR: And on Zoom, we have Mr. Leonard Knee. Leonard, can you speak up?

MR. KNEE: Hi. It's good to see you all this morning, and hopefully we can go through this efficiently.

CHAIR: Thank you. Let the record show that we do have a quorum present then. We have five of our seven members.

We're here today to hear evidence in Tucker United, West Virginia Highlands Conservancy, and Sierra Club versus the Director, Division of Air Quality, West Virginia Department of Environmental Protection. This is Appeal Number 25-02-AQB.

What I'd like to do right now is have the parties introduce themselves. Before I do this, though, let mention that we do have two, I guess, three with the paralegal. Two of the counselors on Zoom, which we'll have them introduce themselves as well. You already know

Mr. Knee is on there. We're going to at least have one witness on there. So I'm going to ask that when people speak today, witnesses and others, please try to speak up as much as you can so those folks can --- can hear as well, okay? And those of you that are on Zoom, if you can't hear us, the parties that are on Zoom, make sure you let us know.

For those that are on Zoom, that are listening in, that are not part of the legal teams and so forth, make sure that your unit at home or wherever you are is muted. If you make noises, if you're talking, or if you rustle with papers or whatever, that'll come across and cut things out. And if that happens too much, we'll have to cut you off. So make sure that you're on silent, as you will.

With that, Mr. Becher.

ATTORNEY BECHER: Thank you, Mr. Chairman. My name is Mike Becher. I'm with Appalachian Mountain Advocates here representing Appellants Tucker United, West Virginia Highlands Conservancy, and the Sierra Club.

CHAIR: Mr. Driver.

ATTORNEY DRIVER: And Mr. Chairman, this is Scott Driver. I'm counsel for the Appellee, West Virginia Department of Environmental Protection.

ATTORNEY YAUSSY: Mr. Chairman, my name is Dave Yaussy with the law firm of Spilman and Thomas, here on behalf of Fundamental Data, the Intervener. Also with me today on Zoom is Mr. Jim Walls.

CHAIR: Jim, you want to introduce yourself?

ATTORNEY WALLS: I do, Mr. Chairman. I'm Jim Walls. My partner and I, Dave Yaussy, represent the Intervener in this matter. Thank you.

CHAIR: Okay. All right.

The Board is an independent agency from the --- independent of the agency that issued the permit. And we heal --- hear permit appeals de novo, which means that it's not looking at what has been --- not bound by what has been done in the past. It's looking at a fresh view.

We hear all hearings impartially in a manner that's fair to all parties. The rules of the Board are found at 52 CSR1 that govern the conduct of the hearing, as does the West Virginia Code 29-1-5-1 and other additions to that.

The hearing is going to be recorded by a court reporter to our left over here. In order to permit an accurate record, all proper names and technical terms

should be spelled out, and only one person should speak at a time. If the court reporter has a problem hearing anyone, she'll speak up and let us know.

Also related to that, as we go through this process today with people on --- on Zoom especially, if anybody refers to anything in the --- in the certified record, please make sure you list the page number so they can try to find it than flip through things. And we know a couple of the page numbers are not real clear. A couple of pages aren't real clear to be numbered. So you may have to describe what you're looking at as well. So we'll keep that in mind as we go through.

The hearing is conducted under what's known as the shifting burden of proof. The burden of proof was set out in the case before the Circuit Court in Kanawha County, Wetzel County, Solid Waste Authority versus the Chief of the Office of Waste Management back in 1999. And the burden of --- shifting burden of proof means that the Appellant has a burden to raise the issue with sufficient evidence to support a finding that the Appellee's decision was incorrect, that it violated a statute or regulation, or otherwise it shouldn't --- it shouldn't have issued the permit. Then the Appellee must produce evidence demonstrating its reasoning in making

its decision. The Appellant then has the opportunity to show that the evidence produced by the Appellee is deficient or --- or a pretext. So that's the way we run things.

The order of presentation is that we'll start with the Appellant presenting their case. Then the Appellee will respond, and then the Intervener. Should also mention before we get started here that in the prior discussions we've had in sessions and order was --- was entered. There are some issues that are considered confidential. And when we get to those issues, we will have to vacate the room. And also those on --- on zoom that are not part of the parties, what we will do is we will mute you from this location so that you can't hear what's going on in that discussion either, so that we can go through those parts in confidential as.

ATTORNEY DRIVER: And Mr. Chairman, this is Scott Driver. If I could interject real quick. I'd spoken with Mr. Becher, and because of the nature of the hearing, I believe that he had agreed that a client representative for the Appellants would not be in the room during the closed portion and that it would just be him and his expert. And I'd just like to verify that.

ATTORNEY BECHER: I understand that the

protective order issued allowed only the attorneys and experts to --- to review material.

CHAIR: Right.

ATTORNEY DRIVER: Thank you.

CHAIR: Okay.

Are there any preliminary motions which we have before we get started? No? Okay.

Are there any agreements or stipulations that the parties have agreed to that we need to get on the record?

ATTORNEY YAUSSY: Mr. Chairman, there may be at some later point, but at this point, we do not have any.

CHAIR: Okay. Okay.

Any questions before we start?

ATTORNEY BECHER: Did you want to raise your objection and get that out of the way, or do you want to go to openings first?

ATTORNEY YAUSSY: Why don't we do openings first?

CHAIR: All right.

So let's start then with opening statements. Mr. Becher, you're up.

ATTORNEY BECHER: Thank you, Mr. Chairman,

members of the Board.

We're here today to discuss the permit that was issued to Fundamental Data. And as explained in our Notice of Appeal, we have a number of issues with that permit. One of the principal issues is made evident by six or seven points of objection is the confidentiality or the designation of confidentiality of certain materials in that. In that permit application that was reviewed by the DEP and was not available to the public.

In deciding confidentially information, in deciding on that designation, first and foremost, we believe that the DEP failed in its duties to properly evaluate the required showing of harm to the business enterprise of the Intervener. Looking at --- looking at the relevant regulatory section, the determination must be made upon a showing that the person or entity has satisfactorily shown the disclosure of information is likely to cause substantial harm to the business's competitive position or the information is voluntarily submitted to the agency and would be likely to impair the State's ability to obtain necessary information in the future.

We don't believe either of these standards

are met. What we're talking about here is calculations of emissions data, basic information like the manufacturer of turbines, the number of turbines, the amount of shutdowns and startups that will be --- be undertaken by the agencies and were used to predict the emissions. That is very basic data that is integral to any permit application and we cannot believe that this is a voluntary submission. That these are things that DEP needs to evaluate a permit properly and does require.

That leaves a necessary showing that this information is going to competitively harm the --- the Company's business. In the record, there are two positions or there are two portions of the record that seek to justify confidentiality. The first is the cover page to the application itself. You can find that on certified record page two to five. There, categories of redacted information are simply and summarily identified as trade secrets without explanation or without giving a rationale for why the disclosure of that type of information would harm this business.

After the initial submission, as the record shows, the --- the DEP questioned the appropriateness of designating this material confidential business information. In response, Fundamental Data

submitted a letter to the agency and that can be found in certified record page, I believe it's 404. Actually, I believe that letter is in a --- in a few pages throughout.

And if you look at that letter, that letter talks a lot about national security, advanced computing, and artificial intelligence. We've decided, the Board has already decided, that the end user of this gas plant is not an issue in this hearing. The permit application did not seek or identify an end user. There is no information in that letter to justify why turning over basic information like the number of turbines, calculations behind emissions for a gas plant is going to be harmful to the competitor's business practices. In fact, we will show that, through expert testimony, this type of information is --- is commonly made available. That a major producer of turbines would provide any prospective customer with that kind of information.

Moreover, this information does not qualify as a trade secret because it constitutes types and amounts of air pollutants discharged pursuant to 45 CSR31-2A. These calculations, because of the way the permit is set up, are necessary to determine the amount, frequency, and concentrations of emissions and whether or

not the plant is meeting the limitations within the permit.

Permit Section 4.1 lists a number of hourly and annual limitations based on pollutant concentrations. Those, however, are dependent upon the redacted calculations. In other words, it is nearly impossible to tell how compliance is measured without looking at that redacted information.

Now, if you look at, and we will get into this during the presentation of evidence. If you look at what was disclosed, there are total maximum, hourly outputs and total maximum annual outputs that are disclosed, and that's --- that's the information that's available to the public. This, however, assumes that the plant is running at full capacity with all the turbines. That in reality is not how most plants dispatch, and there's no assurance that the --- the plant will dispatch that way. Because we don't have information on how much individual turbines will emit or even the number of turbines, it's nearly impossible to scale down those cumulative emissions to determine if the plant is meeting its limits.

For instance, if this plant is running with say five turbines, the number of turbines isn't

disclosed, I'm just throwing a number out there. Those turbines run half the year on diesel, half the year on natural gas, and that is below the total amount of turbines that are running. We have no way, the public has no way and the director has no way to explain if compliance is being met because the only numbers that are available are the total emissions under full load with the full plant operating.

Because of that, this constitutes types and emissions of air pollutants which are not allowed to be redacted. This is further complicated, as our expert will display --- explain by startup and shutdown information. We have no information on what conditions were assumed for startup and shutdowns. All we have is a total annual shutdown and startup number in the redacted application. There is no information on the assumption of the number of startups or shutdowns or how that number was calculated. Because pollutant emissions are different during startup and shutdown, that again does not provide the public or --- does not provide the public and does not allow the Director to explain whether or not compliance is being achieved.

Furthermore, this --- his plant is being permitted as a synthetic miner source. That means there

are certain limitations that it cannot exceed. Principal among those are it can't emit more than 100 tons per year of any criteria pollutant. It can't emit more than ten tons per year of any hazardous air pollutants or 25 tons per year of any combination of hazardous air pollutants. This --- this was explained by the permit engineer in the permit record.

Nitrogen oxides, for example. If you look at the predicted emissions, they're within one percent of that total tons per year. Again, we don't know the assumptions from the redacted data, the load states, the operating conditions under which those predictions were made. As our expert will explain, emissions are going to vary based on atmospheric conditions, temperature, humidity, as well as the operational state and fuel type. Without knowing that information, it's impossible to say --- say with any assurance that this will meet the minor source limitation.

It also assumes that the pollution reduction systems, the scrubbers, are working perfectly. Again, this is within one percent of the threshold. If there is an upset or disruption to the pollution treatment system, it's difficult or impossible to know that. And because there is no direct emissions

monitoring, it is impossible to know whether more emissions are going out during that period of time. This is significant because we're assuming that there is in fact a 90 percent reduction on pollutants based on that pollutant, that --- that scrubber system.

The other pollutant that we will explain in expert testimony is formaldehyde. You know, you'll hear testimony from our expert that he believes that this plant is likely to emit formaldehyde and hazardous air pollutants cumulatively above minor source thresholds. And this is predominantly due to startup and shutdown states when pollution reduction systems are not going to be working at optimal efficiency. We'll walk the Board through why that is in the evidence, but it is important to say that again, formaldehyde, as well as other pollutants, other VOCs which constitute hazardous air pollutants, are going to be emitted in concentrations higher than what the permit predicts. And in fact, looking at the redacted data, these were not accounted for during startup and shutdown states, even though they do vary and in fact are emitted at higher concentration during those states.

Finally, and perhaps most importantly, the DEP in issuing this has shown a disregard for the purpose

and policy of the West Virginia Air Pollution Control Act. Included in the purpose and policy are considerations that go to promoting the economy of the state and the facilitation and enjoyment of natural areas within the state. Specific regulations, most notably air dispersion --- the decision whether to do air dispersion modeling specifically can take into account the purposes and policies of that act.

Despite that, and despite the fact that this plant is located less than a mile from the towns of Davis and Thomas, which are two small, thriving communities that depend on outdoor recreation and the enjoyment of natural areas for their economy, we believe was an abuse of discretion by the DEP. The DEP could have been more protective, could have helped allay fears in these communities, and could have taken additional steps to ensure the protection of those natural areas and to ensure that the economy of those towns and the purposes and policies of the Act were met. It did not.

For those reasons, we are asking the Board to overturn the Department's decision. First, to order that information sufficient to understand the permit, compliance with the limitations in the permit be made public and require a re-notice of this permit with that

application made public for public comment. And second, that the Board find that this permit was not appropriately issued as a synthetic minor source and remand with orders that the proper evaluation of pollutants likely to exceed those minor source thresholds are taken into account.

Finally, direct the DEP to consider the purpose and the policy of the Act in making discretionary decisions regarding this permit in order to protect the special locations, the economies of the Davis and Thomas area, and the natural resources in those locations. Thank you.

CHAIR: All right.

Thank you. Mister --- Mr. Driver, do you want to go next, please?

ATTORNEY DRIVER: Yes. Mr. Chairman, Board members, DEP is here for one task and that is to defend the issuance of this permit against allegations that our decision to issue the permit was arbitrary and capricious. And central to that defense is the issue of whether DEP's CBI determination was arbitrary and capricious.

We're here today to show that not only was DEP's review of the permit application and subsequent

issuance of the final permit not arbitrary and capricious, but that it was done with a meticulous level of attention and concern for following the mandatory non-optional regulatory requirements. In this case, as the record has shown, the Intervener initially claimed that certain information contained in its permit application was confidential business information, which I'll be referring to as CBI, and accordingly that it qualified for redaction from the public permit application.

DEP again, as the record shows, expressed some concern over whether that information satisfied the regulatory definition of CBI. We reached out to the Intervener and asked them to justify why they were claiming it as CBI. Intervenor replied in lengthy detail providing that justification. After review, the agency determined that there were more than sufficient methods for determining the emissions from the facility without that confidential business information and that that claim accordingly met all regulatory requirements to be considered CBI. Once that determination was made, the confidentiality's non-optional. If the CBI claim meets the relevant regulatory requirements, it must be treated by us as confidential.

And it's vital to note, as the Board has

in the past and as I brought up before, DEP only has that regulatory authority that is expressly granted to us by the legislature. We can't rule by fiat. We can't do more or less than the authority delegated to us demands. Our authority to issue or deny permits is strictly prescribed. The Division of Air Quality is delegated authority only over substantive air quality issues. It can make determinations. It can impose terms and conditions outside of its legal authority, and that authority extends to the protection of air quality.

DAQ is not permitted to consider issues outside of that purview. And if the --- if the permit applicant meets all regulatory requirements, they get a permit. Now, in the past, this very Board's stated, and I'm paraphrasing, but it's close to a direct quote. The permitting program is the sole source of DAQ's authority to regulate air pollution. It cannot do more or less than the rules allow. This Board, and again close to quoting, expressly rejected the proposition that the general policy of the Air Pollution Control Act that Mr. Becher has referred to, 22-5-1, creates any authority for DEP to require information beyond that it is given express authority to require.

Today we're going to show that in making

our CBI determination and in determining the propriety of issuing the permit, we followed the law and regulations that we are non-optionally required to follow and that we did so in a manner that wasn't arbitrary and capricious, but that was in fact meticulous, careful, and appropriate. The evidence will show that. And with that, I will pass over to Mr. Yaussy.

CHAIR: All right.

Thank you. Mr. Yaussy, would you like to make an opening?

ATTORNEY YAUSSY: Yeah.

CHAIR: Okay.

ATTORNEY YAUSSY: Yes, Mr. Chairman.

Appellants are making two primary allegations. That the DAQ should not have allowed Fundamental to claim certain information as a trade secret, and that the permit is somehow deficient because it will allow Fundamental to exceed minor source limits. Neither allegation is correct.

First, the trade secret. We claim CBI because the turbine's configuration and the manner in which they would be deployed are not the industry standard and they represent a competitive advantage for Fundamental here and in other states. The method of

operation and configuration represent a plan, pattern, or process developed by Fundamental's principles that will be used to produce a service, in this case, power production, that gives Fundamental a business advantage. The DAQ agreed that we satisfied the standard which is set out fully in the regulations. And furthermore, we're not aware of anybody who's been proposed who will testify otherwise at this hearing.

Having established that the redacted data is a trade secret, the only issue becomes whether Fundamental has protected that data and prevented its release. We aren't aware of anyone who suggests we have not protected it, and we believe the spirited defense that we put up until the Board entered its order shows that we have concluded continue to meet that obligation to protect our trade secret.

Now, you heard Mr. Becher state that emission data can't be kept confidential as a trade secret. But if you look at the definition of emission data, you see that the relevant rules are referring to actual emissions once the source is operating, not the estimated emissions that were redacted in the permit application. In defining emission data, the --- the rule states that it refers to any data that is any emission

which has been emitted by the source. Has been emitted by the source, 45 CSR31B.

The rule further refers to, quote, emissions which under a standard --- under an applicable standard or limitation the source was authorized to emit, end quote. In other words, it's actual emissions coming out of this project when it's built that can't be hidden. It's not --- it has nothing to do with the redaction of the data that was in the application.

And none of those actual emissions are being kept from the DAQ. That is the most important point I think I have to make to you today. None of the actual emissions that this plant emits are being claimed as confidential. When this plant is up and running, it will be confirming and monitoring its actual emissions and proving that it qualifies as a minor source.

The limits in the permit were based on Fundamental's request to be a synthetic minor source permit. To do that, it has to stay under 100 tons per year for each of the criteria of pollutants. To meet those limits, pollution control equipment has to be installed and proper operation verified. Furthermore, Fundamental has to demonstrate through stack testing for each individual turbine that the turbine meets the hourly

emission limitations imposed for NOx, the limiting pollute as we'll describe later, but also for --- for carbon monoxide, sulfur dioxide, and for formaldehyde. The hours of operation, the method of operation, the type of fuel, the heat input, and other parameters have to be monitored and recorded hourly.

If total hours, and I guess this is where we will be going in large part today. If total hours of operation are below what's allowed in the permit and if the turbine shows through stack testing actual measuring of its output that it is meeting the per hour emission limits, the source is going to stay a minor source. It has to be. It's a simple and transparent calculation that we will be explaining more fully in a little bit.

Appellants have said that the project is too large to operate as a minor source, which is, we believe, a ridiculous claim. Of course, it can limit its operations to stay under major source levels. The whole point of a synthetic minor permit is a limitation on the potential to emit that the permittee commits to abide by. To suggest that Fundamental should be denied a permit because Appellants believe it can't or won't abide by its permit limits calls into question the whole concept of permitting. It would be like saying we couldn't issue

anybody a driver's license because we're concerned they have the ability to speed and therefore be violating the conditions of their permit, their driver's license.

No one could get a significant --- a synthetic minor permit if it could be denied solely because an opponent opined that the permittee wouldn't comply with it. It also leaves the Appellants in the strange situation of arguing that Fundamental should only be issued a permit, a major source permit with potentially much higher major source limits.

Fundamental has demonstrated a need for confidential treatment of certain information in its permit application with limited information. That CBI has not prevented imposition of permit limits that limit this --- this --- this project to minor source status. Appellant's permit appeal should be denied by this --- by this Board. Thank you.

CHAIR: Great, thank you. All right.

Do you have a witness you want to call?

ATTORNEY BECHER: Yes. I believe we are going to call, begin with calling standing witnesses. I understand there may be an objection to the calling of standing witnesses. Don't know if you want to present that now or have any. I'll call Jim Kotcon if there is

no objection.

CHAIR: Okay.

ATTORNEY DRIVER: And Mr. Chairman, before we get to Mr. Kotcon's testimony, we are willing to stipulate that Mr. Kotcon has standing to bring the appeal. We are not willing to concede that beyond the. Beyond the requirement of being potentially affected that Mr. Kotcon or any of the other standing witnesses have suffered any actual injury or harm. We don't believe that that is a component of being entitled to bring the appeal. And additionally, if they are found to have standing insofar as they testify to facts or --- or any other information including that --- that would require speculation or expert opinion or that is irrelevant, we would object to them offering testimony on that. And we'll address those objections whenever, when and if they come up. But we are willing to stipulate to standing to bring the appeal by Mr. Kotcon and by the other standing witnesses offered for the Appellants.

ATTORNEY WALLS: Mr. Chairman, this is Jim Walls on behalf of the Intervener. If I may respond?

CHAIR: Go ahead.

ATTORNEY WALLS: I think there are two things at issue here. First, under the statute, any

person whose interest may be affected by the DEP's action, it can file an appeal. And that includes anyone who participated in the public comment process. And so to the extent that the Appellant showed that --- that they participated in the public comment process, they can --- they can file this appeal. I don't necessarily think that's standing. I think of standing as Article 3 standing under the Constitution, which requires, among other things, an injury in fact.

So we will stipulate, the Intervener will stipulate that to the extent that the Appellants can show that each of them participated in the public comment process, they can --- they can file this appeal under the statute, but we can't stipulate that they have Article 3 standing.

CHAIR: All right.

Thank you. Mr. Yaussy, anything you want to add?

ATTORNEY YAUSSY: No. No, sir.

CHAIR: Okay.

ATTORNEY BECHER: Yeah. And I would just say we are satisfied with the stipulation that we have standing to pursue this appeal. The problem becomes, if this is appealed to an intermediate or Supreme Court

later. If we could get a stipulation that standing will not be raised or challenged in those venues, then we --- we do not believe that we have to establish a factual record to support Article 3 standing. However, if the Intervener and the Appellee are reserving the right to challenge standing at the appellate level, that we believe we need to develop that record here, that is a jurisdictional issue. It is an issue that the court can dismiss the case on. And if that record is not developed, we risk losing that argument on appeal.

ATTORNEY GRAY: If you're going to go forward --- this is John Gray, counsel. I'm hearing two types of standing. Standing to bring the appeal, Article 3 standing. If you're going to get witnesses, make sure you separate and put in the proper box because I think standing to bring the appeal has been agreed to.

Correct?

ATTORNEY YAUSSY: If I could just clarify? The right to bring an appeal.

ATTORNEY GRAY: The right to bring an appeal.

ATTORNEY YAUSSY: The right to appeal.

ATTORNEY DRIVER: And I --- and Mr. Gray, this is Scott. I --- I --- well, I wouldn't say

mischaracterized it, but I should clarify that I agree with the Interveners that we are talking about the right to bring the appeal. Standing, I think, might be another issue. So I needed to clarify that, as Mr. Walls had brought up.

ATTORNEY GRAY: So I'm just making sure that the record is clear that all we're going to be talking about with regard to standing during any testimony will be the equivalent of Article 3 standing.

Correct?

ATTORNEY BECHER: I believe there is the issue that Mr. Walls said, if our witnesses have filed comments or if the organizations have comments, I --- I think that standard needs to be met. Unless the --- the Appellee and Intervener are willing to stipulate that those comments have been made.

ATTORNEY YAUSSY: I guess we're looking for a representation by Mr. Becher that comments have been filed on behalf of all three organizations, in which case we would accept that.

ATTORNEY BECHER: I've been informed by my clients that they each had comments submitted by members and on behalf of the organization.

ATTORNEY GRAY: Okay.

So for purposes of the record, when we're talking about standing with these witnesses, we're solely limiting it to an argument over Article 3 standing. So that if we talk standing any, a court of competent jurisdiction will understand the basis for the argument.

Correct? Agreed?

ATTORNEY YAUSSY: Yes, agreed.

ATTORNEY GRAY: Scott?

CHAIR: Scott, are you there?

ATTORNEY DRIVER: Sorry, John, I was on mute. Yes, agreed.

ATTORNEY GRAY: Okay.

With that, let's proceed.

ATTORNEY BECHER: I'm going to call, and actually I misspoke, Dr. Jim Kotcon.

CHAIR: We need to swear him in, please.

COURT REPORTER: Can you raise your right hand?

JAMES KOTCON,

CALLED AS A WITNESS IN THE FOLLOWING PROCEEDING, AND HAVING FIRST BEEN DULY SWORN, TESTIFIED AND SAID AS FOLLOWS:

CHAIR: Mr. Kotcon, you sound like you have a low voice, so please make sure you talk loudly so people can hear you.

Okay?

THE WITNESS: I will do my best. I do.

CHAIR: Go ahead.

DIRECT EXAMINATION

BY ATTORNEY BECHER:

Q. Good morning, Dr. Kotcon. Can --- can you state and spell your last name for the record, please?

A. My name is James Kotcon, K-O-T-C-O-N.

Q. Thank you. And can you tell the Board where you currently live?

A. I currently reside at 414 Tyrone Avery-Road in Morgantown.

Q. How far you is that from this proposed gas plant?

A. It is approximately 65 miles as the crow flies.

Q. Do you use any areas within closer proximity to the gas plant regularly?

A. Yes. I first arrived in Morgantown in 1985, and at that time my wife and I would frequently travel

the area to learn more about the state. One of my most significant memories was coming over the ridge into Canaan Valley. And that striking beauty has impressed me ever since. I visit that area regularly, several times a year for both recreational purposes as well as attending meetings. Led a number of service outings through those areas doing trail work and tree planting. It is one of my favorite places in the state.

Q. And can you explain why it is one of your favorite areas in the state?

A. It is botanically a very interesting area. It is a high elevation wetland, it is scenically very beautiful. It is a center of recreational opportunities, both hiking, camping, cross country skiing. I'm not a big fan of downhill skiing, but. So my preference is for White Grass rather than the state parks. But beyond that, I'm frequently there for a wide variety of activities.

Q. And how do you believe the plant will affect your use of the area?

A. One of my big concerns is the potential for haze increases in scenic areas such as Dolly Sods, Bear Rocks, Canaan Valley. Haze is contributed by a wide variety of pollutants. Particularly aerosols from

nitrous oxides and sulfur dioxide, fine particulates of all types. The area is already heavily impacted.

ATTORNEY WALLS: Mr. Chairman, I hate to object and interrupt, but --- but this witness is testifying about expert opinion testimony. He's not been qualified as an expert. This is ---.

ATTORNEY BECHER: I believe this testimony ---.

ATTORNEY WALLS: This is scientific. This is scientific, specialized knowledge that requires an expert, and I object. Move to strike his answer.

ATTORNEY BECHER: In order to have ---.

ATTORNEY DRIVER: Mr. Chairman, this --- this is Scott. DEP joins that objection.

CHAIR: All right.

ATTORNEY BECHER: In order to have a recreational injury based upon an apprehension of something like haze, there needs to be a reasonable belief that that will occur. And I believe Mr. Kotcon's explaining his understanding, his basis for that belief.

THE WITNESS: As a lay witness.

ATTORNEY WALLS: He ---.

ATTORNEY DRIVER: I'm sorry, Mike. I didn't know if you were done. I apologize, Mike. I

didn't mean to interrupt you. Mr. Chairman, he is unbelievably unqualified to give this opinion.

CHAIR: This is a personal opinion here he's given based on his?

ATTORNEY BECHER: He's testifying to his understanding of the factual basis for haze.

CHAIR: Okay.

So it's not --- this is not an expert witness. It's not testimony based upon the facts as an expert would do it. Is it based on his personal opinion?

ATTORNEY BECHER: It's based on his personal knowledge.

CHAIR: So we --- the Board understands that, and will allow him to go ahead and continue. Although try to keep things restricted if we can, please.

ATTORNEY BECHER: Sure.

CHAIR: Okay.

BY ATTORNEY BECHER:

Q. Just to be clear with that objection, one of your principal --- one of the ways this will principally affect you is --- is haze? Your concerns about haze?

A. Yes. The scenic beauty of that area is only able to be enjoyed if, in fact, we can see it.

Q. And it's your understanding, based upon your

personal knowledge, that this plant may contribute to haze?

A. Yes.

Q. Are you a member of any organizations involved in this appeal?

A. I've been a longtime member of the Sierra Club.

Q. Okay.

What's your role within the Sierra Club?

A. I have been a member for almost 40 years. I've had a number of roles. I'm currently serving as Chair for the West Virginia Chapter. And have been active in a number of different committees.

Q. Let me --- let me actually go back because I'm not sure we got a full answer. How would haze, or even the fear of haze, affect your recreational uses of the areas near this plant?

A. On behalf of the Sierra Club, I've led a number of outings through that area. Hikes, camping trips, et cetera. The scenic beauty is one of the things that we really prize during those trips. It's one of the reasons why the Sierra Club has been actively involved in protection of the Canaan Valley area and the wilderness areas such as Dolly Sods and the state parks in that area. And that would be a way to degrade the experience

that we're trying to promote.

Q. And how does the challenge of this appeal --- appeal align with the Sierra Club's mission and purpose?

A. The Sierra Club's mission statement is to preserve, protect, and enjoy the natural places of the earth. And there's a much longer paragraph if you want to read that, but our goal is to protect these areas for our own enjoyment and for that of future generations. This is a special place in West Virginia and needs to be protected as such.

Q. Now, I understand we represented that --- that our standing witnesses have submitted comments on behalf of the organizations. Was that, in fact, you that drafted comments or assisted drafting comments for the Sierra Club?

A. I did the initial review of the air permit and wrote a first draft of the comments. I circulated that to other members and leaders within the Sierra Club, incorporated their comments, and submitted the final draft to the DEP.

Q. Okay.

And is one of the ways that you were affected by the issuance of this permit the --- the ability to write your comments?

A. Yes. I am very concerned about the amount of information that was redacted in the original application. It became very difficult to evaluate whether the emissions were going to be achievable. A big concern I have was that even the location and height of the smokestack was redacted. It's very difficult to determine how a plume disperses if we don't know where it originates from.

Q. Okay.

ATTORNEY BECHER: I'd like --- to assist the witness, I have a portion of the certified record. I also have copies, if --- if anyone else would like to see it, but I'll.

ATTORNEY GRAY: What page numbers are they?

ATTORNEY BECHER: It's 584 to 590.

CHAIR: Give us a second to find it, okay?

ATTORNEY BECHER: Sure.

CHAIR: Mr. Knee, are you okay with those pages?

MR. KNEE: Yes, I am.

CHAIR: Okay. All right.

Mr. Becher, go ahead.

BY ATTORNEY BECHER:

Q. Great. And first, do you recognize this? This section of the certified record?

A. Yes. This is the response to comments submitted from West Virginia DEP after they issued the permit. The Sierra Club comments start at the bottom of this first page, the question redacting basic information.

Q. So the bottom of 584?

A. Correct.

Q. Okay.

And --- and how far do they extend?

A. They extend through. These extend through the end of this document, page 590. There I think were a couple extra pages of comments that were --- at least a couple of other comments that we'd submitted, but these are the major ones.

Q. Okay.

And I'd like to draw your attention to page 587. And I believe this represents a comment where you are indicating inconsistencies among --- amongst emission factors.

Do you see that?

A. Yes, that's about the middle of the page.

Q. Can you explain to the Board your concern with

this? With this comment?

A. As we reviewed the application and the permit --- the draft permit, there are a number of times when the original draft permit talked about emissions factors and other information that contradicted later information in those documents. For example, as was stated, the emissions of hazardous air pollutants had one limit in one section, which when I multiply that times 24 hours a day at 365 days a year, it comes up to just over 13 tons per year. But a different level was established in the permit. There's no clear basis as to how that information was achieved and whether that's actually reliable and something that we can rely on.

Similar problems occurred with the use of the EPA's AP42 documents for emissions factors. It is not clear how they calculated emissions of hazardous pollutants such as formaldehyde because the data that I saw suggested the potential to emit was much higher than was limited. Would have exceeded the major source threshold, but it was also not clear whether they were accounting for the use of pollution control such as the oxidative catalyst, in which case the potential to emit should have been much lower than what was permitted. So those kinds of ---.

ATTORNEY DRIVER: Mr. Chairman, this is Scott. We're going to --- we're going to renew our objection as to where Dr. Kotcon seems to be going on this. I think we're getting into the realm again of speculation and expert testimony.

ATTORNEY BECHER: And we'll move on.

ATTORNEY WALLS: Mr. Chairman, we --- we join in that objection and move to strike this. This is all clearly expert testimony, and he's not qualified to give this opinion. And he wasn't disclosed as an expert to testify about these issues.

ATTORNEY BECHER: Again, I think he's basing his information on his factual understanding of this permit. I mean, I think all he's essentially said is that he understands the pollution control devices are going to reduce the pollution. He's testified ---.

ATTORNEY DRIVER: And Mr. Chairman, he's also testifying as what, to the --- what the speculative consequences of that might be. And again, he has not been qualified or identified as an expert. As a non-expert, he does not have the --- the ability to give speculative --- speculative testimony on the likely results of any technical issues.

ATTORNEY BECHER: He had the opportunity

to draft ---

CHAIR: Right.

ATTORNEY BECHER: --- technical comments for this permit, and he's explaining the factual basis on his drafts and how he was hindered by the redacted information.

CHAIR: Your objection's been noted. We're going to give the testimony the weight that it deserves as we go forward. Again, it's not --- he's not testifying as an expert and we understand that. He is testifying as to what he commented on or what the Sierra Club commented on within the document on their --- their belief at the time. It's not based on factual evidence. That obviously will come later, supposedly.

ATTORNEY BECHER: Thank you, Mr. Chairman.

BY ATTORNEY BECHER:

Q. Let me just ask. Did the redaction of information make it more difficult for you to clear up and understand these inconsistencies?

A. Yes. Yes. The fact that key parts of the technical information were redacted is what led to my confusion and my concern about the inconsistencies in the DEP's response. I don't know where they got those numbers. It is not clear from the documents in the

application or from the engineering evaluation or from the draft permit how those numbers were achieved. And when I do simple arithmetic, I can come up with a wide variety of other numbers which would make this a much different permit.

Q. Did the DEP's response to your comments clear up your understanding of those inconsistencies?

A. No. To a very large extent, the DEP's response to comments was very generalized, did not address the specific concerns that we had, and omitted any significant response to those comments.

Q. You had, I believe, a couple of comments related to startups and shutdowns. Can you explain your --- your comments there and your concerns writing those comments for the Board?

A. Our concern is that emissions of various pollutants such as nitrogen oxides and others. During a steady state operation when all of the equipment is operating at full temperature is a much lower emissions rate than when things are just starting up and they're getting things up to temperature and the heat has to come through there. When I reviewed other such permits, the emissions can be as much as half of the annual permission --- emissions from startups and shutdowns.

In this particular permit, we don't know how many startups and shutdowns were proposed because that information is redacted. The emissions for --- assigned to startups and shutdowns is very low. It seems unrealistic to me, not that I'm an expert on it, but this does not match what I've seen in other permits. And ---.

ATTORNEY DRIVER: Mr. Chairman, at the risk of poking the bear, just --- just consider our objection ongoing to this.

CHAIR: All right, thank you.

ATTORNEY WALLS: Mr. Chairman, could I have a continuing objection to this entire line of questioning? Everything he's testified to, it's --- it's opinion testimony. And I --- I won't --- I won't interrupt again if the Chairman will give me a continued objection on the basis of the fact that this is expert testimony and he's not qualified, nor has he been designated as an expert.

CHAIR: Noted. We will --- we will go along with your --- your stipulation. Thank you.

ATTORNEY WALLS: Thank you.

CHAIR: Go ahead.

THE WITNESS: Basically, my concern is that without knowing the number of startups and

shutdowns, without knowing even the number of turbines that might be starting up and shutting down, it is very difficult for the public to make any kind of informed comments. And the whole goal of public comment is for the agency to accept an informed comment from others who might have an opinion.

That has been one of the reasons why we raised a lot of objections. It is also my understanding that an air permit is supposed to be based on the maximum potential to emit. We've reviewed a number of these permits, and that potential to emit should make some conservative assumptions about what is the maximum potential pollution. We did not see that when we reviewed this permit, and that raised a lot of questions for us.

BY ATTORNEY BECHER:

Q. And was that due to the redacted information when you were reviewing this permit?

A. That was due almost entirely to the amount of information that was redacted.

Q. Let me ask. If --- if you and the rest of the public had access to confidential information contained in this application, would that have increased your confidence that this permit was adequately reviewed and

issued?

A. Yes.

Q. If the DEP, you had mentioned a --- a concern about haze. If the DEP had undertaken dispersion modeling to look at the effects of the pollutants on areas where this plant, near where this plant is located, would that have increased your confidence that this permit was adequately issued and reviewed?

A. Yes.

Q. Okay.

Do you have --- I know you're not a lawyer, but do you have a basic understanding of the difference between a minor and a major stationary source, the permitting that's required?

A. Yes. We've reviewed quite a number of air pollution permits over the last 25 years. That major source threshold has been an issue in several of them.

Q. Okay.

And is there, is one permitting process more rigorous than the other?

A. The requirements for a major pollution source include much more extensive air dispersion modeling. It requires an analysis of what's the best available control technology. It typically requires a continuous emissions

monitoring system, CEMS. There are a number of other issues that would make this permit much more protective.

Q. Okay.

And would you feel confident that this plant would not affect your recreational use of the areas if it were, in fact, permitted as a major and not a minor source?

A. Confident is ---.

Q. Would it alleviate your concerns in regard ---?

A. It would certainly help to protect those areas, and that would be a major goal that we were trying to achieve.

Q. Okay.

In your use of the area, would you feel more confident in going to use those areas that the laws in place to protect air quality would be enforced and would be protective?

A. Yes.

Q. Okay.

Would that make you enjoy your recreation in those areas more?

A. I do believe so, yes.

ATTORNEY BECHER: Okay.

Nothing further.

CHAIR: Mr. Driver.

ATTORNEY DRIVER: Thank you, Mr. Chairman. Given that our ongoing objection has been overruled as to the entire line of questioning or the overwhelming majority of it from Dr. Kotcon, we will go ahead and pass over to the Intervener at this time.

CHAIR: All right.

Mr. Yaussy, do you have?

ATTORNEY YAUSSY: It'd be Mr. Walls.

CHAIR: Oh, Mr. Walls?

ATTORNEY YAUSSY: Yes, sir.

ATTORNEY WALLS: Thank you, Mr. Chairman.

CROSS EXAMINATION

BY ATTORNEY WALLS:

Q. Dr. Kosin, I just have a few questions. So as I understand it, your testimony is that as a result of the DEP issuing this permit, you're going to be harmed because the facility will cause haze that will affect the aesthetics of the valley.

Is that right, daresay?

A. This facility will contribute to the haze that affects the valley and it moves away from our goal of

trying to clean up that pollution.

Q. All right.

And that's the injury that --- that you foresee coming from the DEP's actions here.

Right?

A. That is one of the issues. There are other issues related to exposure to hazardous air pollutants such as formaldehyde. There are general concerns about the nitrous oxide emissions, which is a precursor to ozone which has direct health effects. We are concerned about any incremental increase in the amount of air pollution in that very pristine area.

Q. Let's focus on haze for a minute. Can you tell us everything you personally did to determine that Ridgeline facility will cause haze or increase the haze factor in the valley to the extent that it's going to affect you?

A. On behalf of Sierra Club, I have been participating with various haze rules and regulations, comment periods, et cetera. We have reviewed emissions data from other surrounding power plants and its contributions to haze. And while there is no direct dispersion modeling because this facility is being permitted as a minor source currently, we know that every

additional emission of nitrous oxides and other aerosols contributes to that haze.

Q. How do you know that?

A. Because that's what haze is. It's the particulates, the aerosols, the fine particles that come from those major pollution sources.

Q. So I'm just a dumb lawyer, and --- and I can tell you that I'm certainly not qualified to look at any data and determine --- make the determinations you just made. Would you agree that to make the opinion, to give the opinion you just gave, you have to have specialized knowledge and training?

A. Not necessarily. Anybody who stood on a ridge top and looked across at the horizon and seen hazes recognizes that.

Q. But you have to look at the data from --- you have to look at --- you have to somehow come up with a hypothesis, a guess as to what this facility will generate in terms of haze.

Right?

A. Yes.

Q. Okay.

And are you telling me that in your opinion, you don't have to have specialized knowledge, training,

or education to do that?

A. Certainly to predict the amount of haze that would be produced, yes. That would require specialized modeling and a lot more precise emissions data than we currently have, as well as meteorological information. But in terms of knowing that given the current background of haze, adding more pollution is going to contribute to that, that doesn't require specialized knowledge.

Q. How about the other injuries that you contend may, you may suffer as a result of this permit being issued? For example, the formaldehyde? I mean, is it your opinion that anybody like a, I don't know, an auto mechanic, a lawyer with no specialized training can look at all the data and come up with a cogent opinion on that?

A. Certainly anybody who is familiar with formaldehyde would recognize that it's a potent carcinogen. It irritates the eyes and the lungs. More formaldehyde does not make it better.

ATTORNEY WALLS: I have no further questions, Mr. Chairman.

ATTORNEY YAUSSY: Mr. Chairman, could I --- could I ask just a quick question?

CHAIR: Sure, absolutely.

CROSS EXAMINATION

BY ATTORNEY YAUSSY:

Q. Mr. Kotcon, are you claiming you have any current harm or damage from the operation of this plant as you sit here today?

A. The plant does not exist, so there's not current damage. The debate that we're having is whether we should allow additional damage sometime in the future.

Q. But no current damage to you?

A. Not currently, because the plant is not there.

Q. Same thing with the permit. The issuance of the permit itself does not damage you?

A. The issuance of the permit is the critical step in authorizing the construction of that plant. It is the only opportunity we have to object to that, and that's why we're here today.

Q. But its issuance does not create haze. That requires the project to be completed.

Correct?

A. That's correct. Yes.

ATTORNEY YAUSSY: Nothing further. Thank you.

CHAIR: Redirect?

ATTORNEY BECHER: Just very quickly.

REDIRECT EXAMINATION

BY ATTORNEY BECHER:

Q. Mr. Kotcon, were you affected in any way in drafting your comments by the way the application of this permit was put out to the public?

A. Certainly. The information redacted made it very difficult to understand how much formaldehyde is being emitted, where the emission sources are, how a plume might move, which way the wind blows. None of that information that would be associated with a major source was present here today in this application or the permit. And that makes it very difficult to have any confidence that the emissions estimates are something that are achievable.

Q. And did that harm your ability to fulfill your right to comment on this permit?

A. Yes.

ATTORNEY BECHER: Nothing further.

ATTORNEY DRIVER: And Mr. Chairman, I have a quick follow up. This is Scott. I'm sorry that I'm

not on video today.

CROSS EXAMINATION

BY ATTORNEY DRIVER:

Q. Dr. Kotcon, a couple of times you have said that we determined or we drafted, we looked at. Who is the we?

A. The people that I circulated to were other members of our conservation committee as well as people with the National Sierra Club staff.

Q. And would members of that we have been the people who actually analyzed the emissions data and came to these conclusions?

A. At least a couple of them were. They also had copies of the application, the draft permit, the engineering evaluation. They had the same information that I had.

Q. So you personally are not responsible for the technical review of the data that you're referring to.

Is that correct?

A. I drafted the initial comments. There were some modifications from some of our team, but I wrote the final draft so I would be responsible for those.

Q. Did you perform the technical analysis used to reach these conclusions?

A. I did the review on the initial permit for our comments. Yes.

Q. Did you do the technical review?

A. I did the technical review, yes.

Q. And what expertise do you have that allowed you to make that technical review?

A. On behalf of the Sierra Club and other environmental organizations, I've reviewed probably 20 or 30 different air pollution permits. I've been involved in several appeals of those and had discussions with the attorneys over the years. I've commented on DAQ rules and have had the chance to review those in depth over the years. I have a PhD ---.

Q. But I'm asking about your technical qualifications to perform technical reviews.

CHAIR: Mr. Driver, I'm going to cut you off right there. You've already stipulated he's not an expert witness, and now you're trying to make him an expert witness.

ATTORNEY DRIVER: If I may.

CHAIR: If you want to be ---.

ATTORNEY DRIVER: Actually, Mr. Chairman,

quite the opposite. I'm trying to demonstrate that he is not qualified to render the opinions and did not perform the analysis. Somebody else did who has not been offered as a witness.

CHAIR: But that's already been stipulated. So we don't need to go there unless --- unless you're trying to make him an expert witness. I have to stop your line of questioning.

ATTORNEY DRIVER: Understood, Mr. Chairman.

ATTORNEY BECHER: Nothing further.

CHAIR: Okay.

You can step down. Thank you.

THE WITNESS: Thank you.

CHAIR: What's your next?

ATTORNEY BECHER: Next we will call Ms. Amy Margolies.

COURT REPORTER: Can you raise your right hand?

AMY MARGOLIES,

CALLED AS A WITNESS IN THE FOLLOWING PROCEEDING, AND HAVING FIRST BEEN DULY SWORN, TESTIFIED AND SAID AS FOLLOWS:

DIRECT EXAMINATION

BY ATTORNEY BECHER:

Q. Good morning, Ms. Margolies.

A. Morning.

Q. Can you state and spell your last name for the record, please?

A. My name's Amy Elliot Margolies. Last name is spelled M-A-R-G-O-L-I-E-S.

Q. And can you tell the Board where you currently live?

A. I currently live on Cortland Road in Canaan Valley in Tucker County.

Q. How far is that from the --- the proposed gas plant at issue in this appeal?

A. It's maybe an eight minute drive.

Q. Okay.

A. But depends on the weather.

Q. Do you use any area --- any areas that that are closer to the plant as well?

A. I do. So I'm a mom of two small children, a five-year-old and a two-year-old. My five-year-old attends school about less than a mile and a half from

this proposed facility. I also am a soccer coach for his U6 Cardinals team, and we practice on the field right next to where this site would be. I also like to hike and bike and walk in the area right around there. I spend a lot of time in Davis and Thomas.

Q. How long have you lived in the area?

A. I originally moved to the area with my husband in 2016. We got married at Blackwater Falls. So I believe the date was, we moved there June 13th, 2016.

Q. Okay.

And do you like living in the area?

A. I love it.

Q. And why do you like living in the area?

A. Well, we decided to move to the area because we wanted to be closer to the outdoors. My husband grew up on the Eastern shore of Maryland. He spent most of his childhood playing outside. I grew up in a city. I didn't have that opportunity in my childhood, and we wanted to be closer, to have that opportunity to be able to hike and camp and raise a family in a place where our kids could be outside instead of inside playing video games like a lot of kids these days.

Q. And is the quality of the natural environment, including air quality, an important factor in --- in your

enjoyment?

A. Absolutely. I mean, I think anyone who's been to Canaan or, you know, Blackwater Falls, Davis, or Thomas knows how much of a gem this area is. It's really special. You know, in the United States and it's, even within the State of West Virginia, we all know it's a really special place that I think all West Virginians can be proud of.

Q. And do you believe you will be affected personally by the issuance of this permit?

A. I do. I think, you know, it really comes down to me for the reasons why I moved to West Virginia. I'm not a West Virginia native, although I've lived here for a while. You know, I moved here to be in the outdoors, in this great area in a small community. With tight relationships, a place where you don't have to lock your car, which is not something I could experience in DC in the '80s. And I'm really just concerned about my children.

My professional background is in public health. I have a PhD in public health from Johns Hopkins. And I'm aware of, you know, just everyone calm down. I'm not here as an expert witness. But, you know, it's. There's information in my brain, from my education and my

experience that makes me legitimately concerned for my children, for my family. My area was really focused on maternal and child health, so it's particularly personal to me.

I have health issues in my family that provide certain vulnerabilities. We all know that comorbidities can be a concern for many people, for children, the elderly. Air quality is a huge part of that. And exposure over a period of time is really a concern, you know. And very recently, my husband had a medical event, a pulmonary embolism. He's in his early '40s. This was a real emergency. He's otherwise been very healthy. And the issue of exposure to fine particulates can raise risks for blood clots to happen again. So that's something I can't stop thinking about.

I also will say, I don't know if any of you in the room are parents, but you never stop worrying as a parent. It's always there.

Q. Have you reviewed --- have you reviewed this permit application?

A. I have.

Q. Do you know from this permit application if the amount of particulate will? Well, do you know if this plant will emit particulate into the air?

A. From what I can tell, yes.

Q. Okay.

And your concerns about your family stem from the knowledge that that plant is going to be emitting more particulate into the air?

A. Absolutely. So I think there's, you know, like I said, it's kind of. Your knowledge is in your head, and whether, you know, whatever the setting is, let's say you're an engineer and you see a playground. You see a piece of playground equipment, and the person who built the playground said, it's totally safe. Go ahead. And you see that that playground is in disrepair. Would you let your children play on it? You're not going to take their word for it.

And that's basically what we're being told here as the public, is that we should take someone. Someone else's word for it. I don't even know this person. We've invited this person to our community, and they won't come. And I'm just really concerned. Why should I take someone else's word for it when they won't even tell us, in plain words, basic information?

How tall will the smokestacks be? Why is that business information? There's smokestacks existing all over the United States. I think as a mom, we deserve to

know those basic things because I coach soccer right there. And the tangible difference in my child's life, I moved here for my child to play soccer in front of a forest, not in the shadow of a smokestack. And I think we deserve the minimum amount of information to understand how that will impact our lives.

I transplanted my family to come there, to have that lifestyle. And if this happens, I really will reconsider being in that area. And it would break my heart, but I can't allow my children to be exposed to that risk.

Q. And did you review the permit application?

A. Yes.

Q. And what was your reaction to --- to viewing that permit application?

A. Well, first I had to do a lot of reading. You know, I'm not an expert in some of these areas, and I think it is challenging for the public to understand a lot of this information. And, you know, I do have a technical background, but it's in a very specific area. So I spent a lot of time looking at it. And I think, yeah, it's really challenging to be able to understand what's in there because of the redactions.

Q. And does --- do those redactions contribute to

your concerns about your family?

A. Absolutely. And like I said, there's also. Like anyone else, there are things that you learn in life that are not in school. And one is that when you get a gut sense that something is not right, there's something you should be suspicious of. Why can't we just know what's going on? If this was a legitimate --- if this was a situation that I shouldn't be worried about, then someone would have come to our community like they have in other communities and say, hey, we've got a great project. Come and work with us. We want your kids to work at this place. We want to help you. We want to contribute to your community.

And we've invited Fundamental Data to come and talk to us. And they will not come and talk to us. We just want to have a conversation. We want to understand how this will impact our lives. That is the basic dignity that the public deserves.

Q. Let me ask you, are you a member of any of the organizations involved in this appeal?

A. Yes, sir.

Q. Okay.

Which one?

A. Tucker United.

Q. Okay.

And what is Tucker United's mission and purpose?

A. Well, so before April, Tucker United didn't exist. We were just people living in the county. Enjoying our lives. And then, you know, like I said, no one came to us and presented this project. We had to find out because someone managed to spot it in the paper and say, what is this? And the first meeting about over 300 people showed up and we all said, what is going on? And the county commission didn't know what was going on because they didn't know either. No one had talked to them.

Why is that? And so I think we all had a lot of questions. And so initially, we weren't an organization. We were just people asking questions. And that's what the public does. We ask questions to try and understand how will these things affect our lives? So we were just getting information. And I think from there, we came together as a group to say, hey, we're concerned about this as a community. We want to understand how this will impact our lives.

And since then, it's basically been an extra job on top of my job and my, having two little kids.

This is not --- this is not my job. This is --- this is just me trying to protect my family, like everyone else in Tucker United. We're just people who live there, and we're trying to understand how this'll impact our lives.

And we do. This is, we're --- we're not opposed to economic development in the county. We want things that are good for our community. We have children who are growing up in this county. We want them to have jobs. The key question is at what cost?

Q. Let me ask, is the filing of this appeal consistent with the mission and purpose of Tucker United as you understand it?

A. Yes, sir.

Q. Okay.

And what's your role in that organization? What's your role in Tucker United?

A. I'm on the coordinating committee of Tucker United.

Q. And just to confirm the accuracy of my representation before, did you submit comments on this permit application?

A. Yes, sir.

Q. And did Tucker United submit comments?

A. Yes, sir.

Q. Okay.

Let me ask you. If the public had access to confidential information in the application, would that have increased your confidence in the review of this permit and alleviated your concerns?

A. Absolutely. I just, I think from the beginning, all we just wanted was information. And I think that's the least, is kind of the least we can ask for is just information. You know.

Q. And if the DEP had undertaken dispersion modeling to further examine how pollutants were going to move away from this plant, would that have increased your confidence the product --- that the project was adequately reviewed?

A. Definitely. I think something that, you know, anyone who lives in Canaan Valley or who visits there might be aware of is that we have a lot of temperature inversions. So we're to going kind of like a bowl. And so we, what locals say, we hold our weather, right? And so that's not something you need to be an expert to understand. You see it when we had wildfire smoke coming down from Canada just very recently. You could smell it, it smelled like burning plastic everywhere. It was hanging in the air. You couldn't see clearly. It was

very obvious what was going on.

And that's an effect that happens, you, like in Canaan, if you live there, you know it. And when I read up on understanding temperature inversions, you know, this is like the key case that caused the national air quality standards was in Donora, Pennsylvania, which was a temperature inversion, right? And so it's not just thinking about, okay, well, we checked the boxes, we're able to tweak the numbers to make sure we don't emit this much pollution or that much pollution.

But Canaan Valley is a very unique topography. Like I said, it's a beautiful, unique place. But it also has these unique weather phenomena. So what happened in Donora could happen here. And that's basically that there was a temperature inversion, people died. And if you go to Donora, Pennsylvania, there's still a museum there. That community is still scarred to this day. And that history led to the creation of these regulations. Because I've spent a lot of my career working in other countries where they don't have regulations like this. And I can tell you, it's not a place we want to go.

Q. Let me just ask. If --- if this modeling was done, would that alleviate your --- your concerns about the plant's effects on your family?

A. It would definitely --- it would provide me with information to better understand. How are these pollutants, are they just going to, we're being told, oh, they're just going to blow away. They're not going to bother you. It's not very much. We've been told they're basically insignificant and not something we should worry about. But, you know, as a mom, I'm not going to take someone else's word for it.

Q. Okay.

And I know you're not a lawyer, but you've --- you've looked into this issue and you've been learning. Do you have a basic understanding of the difference between a minor source and a major source from the Clean Air Act?

A. I've come to understand basically.

Q. What is your basic understanding?

A. My understanding is for the synthetic minor, it's basically that you are artificially maintaining the levels of pollution below the federal threshold that would trigger further regulations for a major source.

Q. Okay.

And do you know if the permitting of a minor source or a major source has a more rigorous review?

A. From my understanding, a major source review

triggers this federal threshold and is subject to much more rigorous standards.

Q. And if this plant were permitted as a major or rather than a minor source, would that alleviate your concerns about ---?

A. Absolutely. Absolutely. And in the end, we want to make sure that our community is safe. And like I said, we want to make sure that that information --- I mean, if we were able to even see the information, I mean like was said earlier, if --- there are headers that are redacted. I mean, what's the justification for that? How is that confidential business information of headings on a table?

If I ever did something like that in my doctoral work, I would have been laughed out of the room. You know, I --- I just, it's hard for me. And I understand that, you know, I'm not an expert in this area. I'm not a lawyer. But I think as the public, you know, to put yourselves in our shoes. We're going to live with this forever. We will see the impacts of this project. This is a permit for everyone else. It's a permit business proposition for someone else, but we live with this. Our children live with this forever.

ATTORNEY BECHER: Nothing further.

CHAIR: Mr. Driver.

ATTORNEY DRIVER: Thanks, Mr. Chairman, I'm aware of the Board's previous rulings. I understand that I do have to make a record. I'm going to lodge a separate objection for this witness. To the extent her testimony went to speculation, opinion, or legal conclusions, we'll object to its admission. And other than that, I'll pass over to the Intervenor.

CHAIR: Mr. Walls.

ATTORNEY WALLS: Thank you, Mr. Chairman.

CROSS EXAMINATION

BY ATTORNEY WALLS:

Q. Ma'am, are you familiar with the confidential business information statute under which the DEP reviewed Fundamental's claim for confidential or trade secret status with respect to its permit application?

A. As, yes, in a general sense. As much as a non-lawyer can.

Q. Okay.

And where --- where do you go to find that statute?

A. That, off the top of my head, I can't recall,

sir.

Q. How did --- have you reviewed the statute?

A. Have I reviewed the statute in detail? I've looked over it in the past, yeah. It's been a long nine months of learning a lot about this whole process.

Q. Okay.

And just so the record is clear, I didn't hear you contend or allege or assert that the DEP violated the statute, the --- the confidential business information statute when it approved Fundamental's request for trade secret status with respect to certain of its information.

Correct?

A. In this current testimony, I didn't have --- I didn't mention that specifically. I believe it was in my comments, but I can't remember.

Q. Okay.

And which parts of the? Well, do you believe that the DEP violated the confidential business information statute information?

ATTORNEY BECHER: I'm going to object. I mean, that calls for a legal opinion.

THE WITNESS: I guess I'm confused because you're saying I can't be a lawyer, but I am a lawyer. I feel like we're back at this you're an expert, you're not

an expert.

I, my --- look. I'm a member of the public and I'm speaking as such. I'm speaking as a mom. I have information from my, you know, prior education, but I'm not a lawyer. I'm not a confidential business information specialist. So I mean, I'm just trying to work with what we've seen and my understanding. And I may be wrong, because again, I'm not a lawyer. Is that for confidential business information, the concern is about other businesses taking that information and using it for a competitive advantage, right?

So I guess I would question, why would the height of a smokestack be confidential business information? Or why would the headings on a table be confidential business information? And as a member of the public, why can't I know how this will affect my family? I just, and so I think what you are asking is, do I think that the DEP did its due diligence in terms of examining whether or not this was CBI? And so I'd say no, I don't think so.

BY ATTORNEY WALLS:

Q. But you can't point to any portion of this --- of the CBI statute, confidential business information statute.

Do you agree?

A. Am I required to do so?

ATTORNEY BECHER: Objection, calls for a legal conclusion.

THE WITNESS: I don't think I'm required to do that, sir.

CHAIR: Okay.

You're doing ---

THE WITNESS: I'm not a lawyer.

CHAIR: --- just what Mr. Driver did earlier. You're trying to --- to make her some kind of an expert witness. She's already said she's not an expert. So unless you have something else, I'll just stop this line of questioning.

THE WITNESS: My expertise is protecting my family, and I will continue to do so, sir. That is why I am here.

ATTORNEY WALLS: Mr. Chairman, I would appreciate the ability to finish my question before being interrupted by the witness or opposing counsel, whatever. My problem is the Appellant can --- has been permitted to ask her questions about this issue, but --- but I'm not for the same ---?

CHAIR: You're allowed to ask the

question, but you've asked it three times and you've got an answer. You've asked --- you've asked if she's looked at the statute. She has said she's looked at it. She's not an expert. There's really no reason to keep it --- keep pounding on that issue.

ATTORNEY WALLS: Thank you, Your Honor. Thank you.

CHAIR: That's all right, you got it.

BY ATTORNEY WALLS:

Q. So ma'am, do you understand we're here today to determine whether or not the DEP errored in granting the permit to Fundamental?

Correct?

A. Yes, sir.

Q. Have you been injured, damaged, harmed in any way by the DEP's granting of that permit?

A. I believe I am here because I am concerned about the implications for my family. And also I am concerned that I have not been given sufficient information as a member of the public. This information, key information, was redacted that affects my ability to understand how this would affect my family and my community. So I do believe that the DEP errored in approving this permit because I don't think it has been

given --- the public has been given sufficient and adequate opportunity to understand the implications of this project.

Q. And I apologize. Maybe my question was a little misleading or confusing. My question was, have you been harmed? Have you personally been harmed by the fact that the DEP has issued this permit to Fundamental?

ATTORNEY BECHER: Objection, asked and answered.

CHAIR: Objection sustained.

BY ATTORNEY WALLS:

Q. How have you been armed by the DEP's issuance of the permit to Fundamental?

ATTORNEY BECHER: Same objection, asked and answered.

CHAIR: This is --- I'm going to sustain it as well. You --- you're going over the same thing over and over. We've got your point.

BY ATTORNEY WALLS:

Q. So ---

A. I guess ---.

Q. --- ma'am, I understand you moved to Canaan Valley about nine years ago.

Right?

A. Can I just ask a clarifying question?

CHAIR: Yes, ma'am.

THE WITNESS: So I --- I guess I'm a little confused because you're saying whether I was harmed. But my understanding is the purpose of this process is to go through a process that ensures that a project aligns to the regulatory boundaries that are to protect the public. But if the only opportunity for the public to be harmed is after a project has been completed and then harms them, that seems to defeat the purpose of regulations that have been designed to protect the public in the first place.

So then you're saying, well, we can't really have you admit that you've been harmed until something like Chernobyl happens. And then you say, oh, okay, I was harmed. I don't think that's the intention of this process, but I may be wrong. I'm not an expert, but can you clarify that to me? Why I would not be able to have the ability to have consideration as a member of the public to say I'm concerned about the implications for my family until the project was on top of my son's school?

ATTORNEY WALLS: Mr. Chairman, I move to strike this as non-responsive. There was no question

presented to this witness. It's only appropriate for ---.

THE WITNESS: My question is, when would you consider harm to ---?

ATTORNEY WALLS: And I would ask --- I'm going to ask the Chairman to --- to ask the witness not to interrupt me again. But there was no question on the table. I moved to strike the soliloquy.

CHAIR: We could strike it.

ATTORNEY WALLS: Thank you.

BY ATTORNEY WALLS:

Q. Ma'am, I understand that you moved here nine years ago.

Is that right?

A. In 2016, sir.

Q. Okay.

And were you married at that time?

A. As I stated, I moved here when I was unmarried, which was June 13th. And then I got --- oh, no, sorry. We got married on June 11th. So I moved here a couple days before I was married.

Q. Okay.

A. Not sure why that's relevant.

Q. And, I'm sorry. I didn't mean to interrupt

you. Go ahead. Were you finished?

A. Oh, yeah, I'm done.

Q. Okay.

And when you moved to the Canaan Valley in 2016, were you aware that the Mount Storm Power Station burns millions of tons of high sulfur coal per year?

A. Sir, I --- I'm not sure where you're going with that.

Q. Yeah. Can you answer the question?

A. Yes, I'm aware of Mount Storm. Yeah.

Q. Okay.

A. Which is in a completely different location on a ridge where the air blows in an eastern direction.

ATTORNEY WALLS: Your Honor, I would --- Mr. Chairman, I would ask --- I would ask the Board to ask the witness to respond to my question. If she wants to make a speech, her lawyer can Cross her or Redirect her.

THE WITNESS: With all due respect, sir.

ATTORNEY WALLS: We're getting a little off the rails here.

CHAIR: Just --- just say yes.

BY ATTORNEY WALLS:

Q. My question was --- was whether or not I knew

that mount --- about Mount Storm Power station being in the area where she lives at.

A. Of course I am. You see it when you drive into town. Of course.

Q. Okay.

A. It's far out corridor H. But you are, as anyone who drives into Canaan Valley can see, they are not driving to Canaan Valley to go to Mount Storm. They're driving past it to get away from it.

Q. Okay.

When you moved --- my question was, when you moved here in 2016, were you aware that Mount Storm Power Station burned millions of tons of high sulfur coal per year?

A. Yes.

Q. In your direct exam, you talked about, and I'm paraphrasing and I'm sure you'll correct me if I'm wrong, but you talked about something being a --- a hunch. Do you remember that?

A. Gut feeling I believe I said.

Q. Gut feeling, yes. And I apologize, a was taking notes and I didn't --- what was that gut feeling about?

A. I was saying I was concerned about the way this

process has worked in terms of the Applicant, Fundamental Data, that there was not any information given to the community up front. That the county commission was not contacted or made aware of this rather large project in our county. That no one approached us in the community to talk to us about the implications. I was saying I have a --- I had a feeling that when you see that someone is not being transparent, that it raises concerns.

ATTORNEY WALLS: No further questions. Mr. Chairman.

CHAIR: Redirect.

ATTORNEY BECHER: Just one, Mr. Chairman.

REDIRECT EXAMINATION

BY ATTORNEY BECHER:

Q. Ms. Margolies, would you explain why, despite the presence of Mount Storm, you have concerns about this plant?

A. Well, sure. I mean, you know it's not apples and apples, right? So if anyone is familiar with the area, Mount Storm is not right next to the Town of Davis. It is not right next to the town of Thomas. It is not on top of Canaan Valley. Mount Storm is much farther out.

Actually, not even in Tucker County. It is outside of our county boundaries. It is also on a ridgeline. The prevailing winds blow away from Canaan Valley. As I've said, I am concerned about this specific project. I'm not interested in conjecture about other power plants in other places. We are here to speak of this particular proposal. And this is the proposal I'm concerned about.

I'm fully aware that there are other power plants out there in the world. The one I'm concerned about is the one on top of my kids' school.

Q. Thank you.

CHAIR: You can step down.

THE WITNESS: Thank you.

CHAIR: Thank you. All right.

We're going to take a ten minute recess so we can get a break, stretch your legs, okay? Go back in ten minutes.

(WHEREUPON, A SHORT BREAK WAS TAKEN DURING THE PROCEEDING.)

CHAIR: All right.

Back in session. Becher, do you have another witness to call?

ATTORNEY BECHER: Yes, we'd call our third and final standing witness, Ms. Marilyn Shoenfeld. And I believe she's on Zoom.

CHAIR: Okay.

And we've agreed to try to keep questioning close on this one.

Right?

ATTORNEY BECHER: Yes. And --- and Marilyn, we have been requested by the Board to keep this succinct and efficient.

MS. SHOENFELD: Do what?

ATTORNEY BECHER: To --- to keep it short.

MS. SHOENFELD: Oh, okay.

I'm not good at that.

ATTORNEY BECHER: We'll --- we'll do our best.

CHAIR: We have to swear her in first?

ATTORNEY BECHER: Yes.

COURT REPORTER: Can you please raise your right hand, ma'am?

MS. SHOENFELD: Yes.

MARILYN SHOENFELD,

CALLED AS A WITNESS IN THE FOLLOWING PROCEEDING, AND

HAVING FIRST BEEN DULY SWORN, TESTIFIED AND SAID AS FOLLOWS:

DIRECT EXAMINATION

BY ATTORNEY BECHER:

Q. Okay.

Ms. Shoenfeld, can you, just --- just so the record's clear, state and spell your last name for the Board?

A. My name is Marilyn Shoenfeld, and it's S-H-O-E-N-F-E-L-D.

Q. Okay.

And --- and where do you live, Ms. Shoenfeld?

A. I live in, at 167 Balsam Way in Davis in Canaan Valley, in Timberline.

Q. Okay.

And do you like where you live?

A. I love where I live. We moved here, bought the house in 2001. I lived here permanently as a permanent voting resident of Tucker County since 2007.

Q. Okay.

Why do you like living there?

A. We moved here because of clean air, removed

from the city, the healthy environment, the natural resources, the protected public lands, the availability of hiking, of access to Dolly Sods, and the wonderful small towns of Davis and Thomas.

Q. Okay.

And are Davis and Thomas closer to the plant than --- than your actual residence?

A. Oh, yes, much closer. My house is about eight miles from where the plant is, and Davis and Thomas are less than a mile.

Q. Okay.

How frequently do you visit Davis and Thomas?

A. I would say the three to four times a week. And I go there, my church is there, I shop there, I socialize there, and I volunteer there.

Q. All right.

And why do you believe that you'll be affected by --- by the permitting of this Fundamental Data gas plant?

A. In looking at the permit, even the permit as written and as approved emits an immense amount of pollutants into the air. And my concern is that the air quality will be deteriorated. And that it will affect various habitats, environments, including the Canaan

Valley National Wildlife Refuge and, which has 19,000 acres, and Dolly Sods, which is a Class 1 protected area under the Clean Air Act.

Q. Will ---?

A. As well as the Towns of Davis and Thomas.

Q. Will it affect your enjoyment of the area?

A. Oh, yes.

Q. How so?

A. It would affect, I'm elderly, as you can see. It would affect my health. It would affect my ability to enjoy the areas that I love. I think it would affect primarily the health of the people who live in Davis and Thomas, particularly the school, the library, the food pantry, and the new affordable housing development are all eight tenths of a mile from the gas plant. So those emissions are going to affect that area. And I'm not testifying as an expert because I'm not, so.

Q. Okay.

Thank you. Thank you for that. Will this --- this affect your enjoyment of living in the area knowing that this gas plant is permanently allowed to be built?

A. Yes, I think it will. I think it will come cause a lot of harm with the deterioration of the air quality.

Q. Are you a member of the organization, any of the organizations involved in this appeal?

A. I am involved with the West Virginia Highlands Conservancy.

Q. And what is your role in the organization?

A. I'm president.

Q. Did the Highlands Conservancy submit comments challenging this permit?

A. We did.

Q. Okay.

How does this --- this challenge to the permit align with the --- the mission and values of the Highlands Conservancy?

A. The Highlands Conservancy's mission statement states that we promote, encourage, and work for the conservation, including both preservation and wise management and appreciation of the natural resources of West Virginia and the nation. We also preserve, advocate, and protect these areas. We have been in existence for 60 years. We have 1,781 members of whom 556 live in Tucker County.

Q. Thank you. Now, in the interest of keeping this short, if I asked you about your concerns concerning haze, for example, would your testimony be substantially

similar to that of Dr. Kotcon, who testified earlier?

A. It would, it would. It would be not necessarily haze, but the quantity of pollutants that are being emitted into the air and how they're carried and how they're dispersed and how they're going to affect Dolly Sods and the other protected areas and the people in the town.

Q. And would --- would the permitting of this plant detract from your enjoyment of Dolly science?

A. Oh, definitely. Yeah. Yeah, I think it would.

Q. Let me ask you if --- are some of your concerns? Do they stem from or are they exacerbated by the redactions of the information department application?

A. Yes. That was one of the main thrusts of our comments were, is that the permit was so thoroughly redacted that you really could not tell what was going on. And as other people have said, the height of the turbines, the redaction of the calculations of the emissions, and then in the permit itself, how all the level --- the emission levels were just under the level of it having to qualify for a major source permit.

Q. Okay.

And you had said the height of the turbines. Do you mean the height of the smokestacks?

A. Yes.

Q. If this permit were, or if the redacted data in this permit were made public, would that alleviate some of your concerns?

A. Yes, it would.

Q. Okay.

If the DEP had undertaken dispersion modeling to, for example, see how this would affect Dolly Sods, would that alleviate your concerns?

A. It would have. And we asked for that at the public meeting at Canaan, and it was refused. We offered to do dispersion modeling on our own and pay for it, and that was also refused.

Q. Okay.

Do you have any basic understanding between the difference between a minor and a major source under the Clean Air Act?

A. I have a very basic understanding of it. And the minor source has much less monitoring requirements and restrictions and gives the company much more flexibility in what they're going to do with their emissions. Whereas a major source would require air monitoring and POC approval and various other protections that would be afforded to the public.

Q. Would your concerns be alleviated if this were permitted as a major source rather than a minor source?

A. Yes, it would.

Q. Okay.

And would those alleviations of your concerns, would that increase your enjoyment of your activities in the area in Dolly Sods?

A. It would that I would --- I would have knowledge of what the air quality actually was if there was monitoring going on. And so it would make me more comfortable going up there. Yes.

Q. Thank you.

ATTORNEY BECHER: Nothing further.

CHAIR: Mr. Driver.

ATTORNEY DRIVER: Thank you. Mr. Chairman. I think I only have one question.

CROSS EXAMINATION

BY ATTORNEY DRIVER:

Q. Ms. Shoenfeld, you said that it would make you more comfortable if you knew that there was monitoring going on.

Is that correct?

A. Yes, I did. Yeah.

ATTORNEY DRIVER: I'll pass to the Intervener --- oh, actually, before I do, Mr. Chairman, just to make the record, the same objection I made about to the extent that the witness's testimony goes to speculation, opinion, or legal conclusions, I enter an objection. And I'll go ahead and pass it to the Intervener.

ATTORNEY WALLS: Mr. Chairman, we join in the DEP's objection.

CROSS EXAMINATION

BY ATTORNEY WALLS:

Q. I just have one question, Ms. Shoenfeld. Have you or have the Highlands Conservancy been injured or damaged by the DEP's decision to issue the permit itself?

A. It has caused me personally emotional distress, and it has caused a lot of our staff to spend an immense amount of time researching the permit and coming up with our response. So I don't know if you'd call that harm, but it was definitely not positive. I think the harm is in the future when the plant is actually built, there would be physical harm to people's health.

Q. Thank you.

ATTORNEY WALLS: No further questions, Mr. Chairman.

CHAIR: Any Redirect?

ATTORNEY BECHER: Yes.

REDIRECT EXAMINATION

BY ATTORNEY BECHER:

Q. That --- that emotional stress you mentioned I think is self-evident. Let me ask you about the attention of your staff. Did that incur --- did that cause the Highlands Conservancy to expend resources in --- in challenging this plant?

A. Yes, we spent resources in researching the permit and writing our comments.

ATTORNEY BECHER: Nothing further.

CHAIR: All right.

Thank you, Ms. Shoenfeld. We appreciate your testimony.

THE WITNESS: Thank you.

CHAIR: Next witness.

ATTORNEY BECHER: Next we will call Mayor Al Davis. Excuse me, Mayor Al Tomson, the --- the mayor

of Davis.

MR. TOMSON: I was confused if that was me or not.

COURT REPORTER: Can you raise your right hand?

ALAN TOMSON,

CALLED AS A WITNESS IN THE FOLLOWING PROCEEDING, AND HAVING FIRST BEEN DULY SWORN, TESTIFIED AND SAID AS FOLLOWS:

DIRECT EXAMINATION

BY ATTORNEY BECHER:

Q. Mayor Tomson, will you state your name and spell your last name for the record?

A. Sure. My name is Alan Tomson. Tomson is spelled T-O-M-S-O-N. There's no H and there's no P.

Q. And Mayor Tomson, it may be self-evident at this point, but can you tell the Board your current profession?

A. I'm the mayor of the Town of Davis, and I work with the town council, and I act as the CEO for the organization.

Q. How long have you been in that position?

A. I've been the mayor for five years. Right now I'm in my third of two year terms. And before that, I was on town council for six years.

Q. Can you briefly describe your education and work background?

A. Sure. I graduated from West Point and then spent 32 years as an army officer. I started as an infantry paratrooper, picked up a secondary specialty as a financial controller. I then morphed into special operations, and I ended my career with military and national intelligence in the Washington DC area.

I have an engineering degree, I have an MBA, and I have a doctorate in organizational leadership. In my fiscal responsibilities in the military, I had a combined resource responsibility exceeding $32 billion. I was responsible for 45,000 positions, and I served as a commander for a special operations airborne brigade. So that's kind of my background.

Q. As mayor of Davis, and given your background in managing economies, is it part of your role to understand economic drivers for the community?

A. I think it is. We're in a tourist based economy, and the drivers for that are critical for me to

understand and ascertain how different things affect those --- those drivers and conditions.

Q. What --- what attracts people to the Town of Davis?

A. Well, I think it's, as you've heard already, it's the outdoor environment. It's the, I guess the opportunities for recreation that are all focused on the outdoors. Whether it's skiing in the winter, world class mountain biking in the spring, summer, and fall. We have hiking trails, cross country skiing trails. We have opportunity for people to partake in the area. And I think it goes back to the late Senator Robert Byrd described the area as the crown jewel of West Virginia with Blackwater Falls and Canaan Valley in particular.

Q. Thank you.

ATTORNEY YAUSSY: Mr. Chairman, we're going to object at this point. If this testimony's going to be about the beauty of Canaan Valley or its effect on tourism of the plant, I mean, all that is irrelevant to the permit itself or the confidential business information that was redacted. It's all irrelevant.

ATTORNEY BECHER: And we would argue --- go ahead. Go ahead, Scott.

ATTORNEY DRIVER: Mr. Chairman, we join

and if it's, if the objection's overruled, just please consider it an ongoing objection.

ATTORNEY BECHER: Yes, and --- and we had argued about this a little bit previously at the --- the prior session of the hearing, but there are certain regulations, again, most specifically regarding air dispersion modeling, which specifically direct and allow the DEP to take into account the purposes and policies of the West Virginia Air Pollution Control Act, which include promoting the economies of the state as well as facilitating enjoyment of natural areas.

And Mr. Tomson is here to talk about the economies of these towns which contribute to the overall state economy as well as how that economy is based on the enjoyment of natural attractions.

ATTORNEY YAUSSY: And to the extent he's going to be doing that, offering opinion testimony on the economy and its effect, it's again, expert testimony. He's not qualified to give testimony on that --- on that score or anything else.

ATTORNEY BECHER: I believe as the mayor of Davis, and he has already testified that he has a duty to understand the economies. He will express his understanding, his factual knowledge of what those

drivers are.

ATTORNEY GRAY: He was not designated as an expert?

ATTORNEY BECHER: He was not designated as an expert.

ATTORNEY GRAY: Okay.

So the Board will give it the appropriate weight.

ATTORNEY BECHER: Thank you.

ATTORNEY GRAY: The Board, but not as an expert.

ATTORNEY YAUSSY: Note our continuing objection.

CHAIR: Right. We'll note it.

ATTORNEY YAUSSY: Thank you, Mr. Chair.

CHAIR: And ask to keep the questioning and answers short. We already, we all understand the beauty of the area and so forth. So try to keep it.

BY ATTORNEY BECHER:

Q. All right.

In addition to the beauty, can you describe the economic base of Davis and Thomas?

A. Well, I think it all focuses on outdoor recreation. We have outfitters there. We have ski

areas, we have bike shops, we have restaurants, distilleries, breweries, all things that support a tourist-based economy.

Q. And what --- what is the view of the community based on your understanding of this proposed gas plant?

A. Well, I think if you take into consideration the community as being defined as the City of Thomas, the Town of Davis, and Canaan valley, the majority of the people, from my appreciation in interacting with the community, object to this proposed power plant.

Q. Okay.

Based on your understanding of the communities and its values, do you think the gas plant threatens the economic basis of --- of these towns?

A. I think it does. I think people have voiced their concern with regards to. First, would they themselves, as residents, continue to live there? And other people have expressed concerns as to whether they want to come and visit the area. And I receive phone calls and --- and other contacts from people that express those.

Q. Okay.

Is the economy in Davis, in --- in the other areas in the vicinity more susceptible to disruption from

a gas plant than in other communities?

A. Well, I think as far as the gas plant and the backup diesel power for the plant, that does threaten the area. What we realized during COVID was that we had an economic boom in tourism because people from other areas wanted to find spaces where they had room to be away from other people and they had clean air to breathe. So we had an upsurge in tourism that continues to this day. And that's reported from the convention and visitor's bureau.

Q. Great. And so your factual understanding of that is based on your role as mayor in understanding the information from the visitor's bureau?

A. That is correct.

Q. Do you share the values of the community or do you believe that your values are consistent with --- with the majority of the community?

A. Well, I think my values are I serve at the pleasure of the community. If --- if they don't agree with me, then they can vote me out office, which they haven't done three times. So I think that our values are in sync. And again, interacting with the community. I hear the same things expressed by people that I have concerns myself with regards to the proposed power plant.

Q. Okay.

And what --- what are your concerns about the proposed power plant?

A. Well, for me, the biggest concern is the toxic emissions and the close proximity of the power plant. I've gone on record before in saying I don't oppose data centers, I don't oppose the power plant if they are put in the proper location. And I disagree with this proposed location because it's less than a mile from the two municipalities, and because of prevailing winds and also the temperature inversions, it threatens Canaan Valley. And those are things that trouble me both as a mayor and trouble me as a private citizen.

Q. If this gas plant is ultimately built, will that affect your desire to remain in --- in the town of Davis?

A. I think it would. I'm a 26-year cancer survivor. And what I've learned from the toxic emissions and EPA documents that talk about the fact that people are more prone to disease and other factors when they live closer as opposed to further away from the source of emission, that would probably have me and my family move away. And I wouldn't want my family and my sons and grandkids to come and visit the area because I wouldn't

want them exposed to those toxins.

Q. Did the --- did the presentation of this permit, the way that this permit process was undertaken, do you think that --- that contributed to negative feelings in the community?

A. I think as far as the permit being a surprise, I had a call from an individual that said, was I aware of this permit for a power plant? And I said, no, I wasn't. I called the mayor of the City of Thomas. I asked him if he was aware of the power plant. He said no. I called the president of the county commission and asked them if they were aware of the power plant, and they said this is the first they've heard of it. And I called the executive director for the Development Authority for Tucker County, asked the same question and I got the same response. They were totally unaware.

So the local community was totally blindsided by the effort to build a proposed power plant in the area. And there was no local discussion or consideration where I think, it's very disingenuous, both to the area and to the citizens. And I think if we had that dialogue early on, probably a better solution could have been found and would have avoided all this angst.

Q. Thank you. And --- and Mayor Tomson, is there

anything else you'd like to say in your capacity as mayor or as mayor personally to help this Board make their decision?

A. Well, I think there's --- there's a couple of things. I think the DEP hearing that we had was --- was very effective, very professionally run. It was scheduled for two and a half hours. They went past 11:00 p.m. that evening. Gave everybody that wanted to talk an opportunity to express their opinions, their concerns, and ask their questions.

What also came to light in that hearing was that the Air Quality Division gets about 300 applications a year, and they approve 300 applications a year. So that was a little bit of a surprise. And the takeaway from many people that I talked to at that hearing was that they had concerns that the Air Quality Division was more concerned with helping business get to an approved permit as opposed to the health concerns of the public and the community.

The other concern that I have is that the DEP Air Quality Division process is very formulaic. It's a --- it's a number of steps. You check the box, you get a permit. There was not, as best I can tell, a real challenge of the synthetic minor permit designation by

Fundamental Data. If you go to open source information and you look at about 30 of the largest power plants in the region, this one, based on people's estimates of the power output, would be in the top quarter of those 30. And of those 29 other power plants, they're all major source. So it begs the question of a layperson why this one is allowed to be a synthetic minor with less. Less analysis, less determination.

And the final concern that I have is, is one kind of common sense. And this is again a question to the Air Quality Division. You have a power plant that's not going to be connected to the grid. It's going to produce power for specific customers. Fundamental Data in a Wall Street Journal article said that they would be supporting power to data centers. Data centers operate with continuous power as an absolute requirement.

How can Fundamental Data say that we will stay within the limits of a minor source permit and we will ramp down when we get close to those limits when they have to provide non-interrupted power to support data centers? To me it's illogical.

And the final point that I would make is everybody keeps saying this is a natural gas fired power plant. There's going to be stored 30 million gallons of

diesel fuel as a backup source of power. Which again supports the concept that they want to produce power without interruption because the diesel fuel is there as a contingency if there's a break in the natural gas supply. So again, from a layman's perspective, there's still more questions that --- that need to be answered. And we don't feel that through the permitting process that those necessarily received the due diligence that they should have been afforded. That's all I have.

ATTORNEY BECHER: I have nothing further.

CHAIR: Mr. Driver.

ATTORNEY DRIVER: Thank you, Mr. Chairman. I've just got a couple of questions.

CROSS EXAMINATION

BY ATTORNEY DRIVER:

Q. Mayor Tomson, have you always opposed the implementation of this facility in Tucker County?

A. I did not. My initial reaction was I wanted to find out more information. I requested and had a public meeting to glean the --- the feeling of the community as well as to share all the information that was known at the time. This was back in April. We had 300 people

attend that public meeting and we had 100 people video conference. So 400 people were interested in the subject. And I publicly stated in that meeting that I was neutral to the proposal. Doing my due diligence, talking to operators of power plants, talking to environmentalists, talking to experts in the scientific community, and talking to experts on data centers as recently as two weeks ago, I formed a different opinion that this was dangerous to the community, harmful to the public, and it threatened the wellbeing of the economics of --- of the area.

Q. Have you ever gone on record stating that you vocally opposed the construction of this facility anywhere in Tucker County?

A. I have.

Q. Could you tell me when that was?

A. I did it at the public meeting that the DEP had. I've done it at council meetings. I sponsored a resolution for the Town of Davis that's opposed to the building of the power plant. So those are just a couple of the things. And I've gone on public record on the media as saying the same thing.

Q. Would you say then that it's not a matter of being a short distance from anywhere in Tucker County,

but being anywhere in Tucker County whatsoever?

A. I think the problem is Davis, Thomas, and Canaan Valley, and it's the proximity that concerns people with regards to their health. There are other areas of Tucker County that would not be affected by the power plant, such as the county seat, the City of Parsons. So, you know, my focus is on top of the mountain where I live and where I'm the mayor.

Q. If there are areas in Tucker County where it would not have impacted it or impacted the communities, then why do you oppose it everywhere in Tucker County?

A. I don't. I would be very happy if they move the power plant next to Mount Storm, keeping it in Tucker County, but 15 miles away from the populous municipalities, and it wouldn't be in the prevailing winds that go over Canaan Valley.

Q. So I might be misunderstanding what you said about --- about statements you have made. You've never said that you oppose the building of the facility anywhere in Tucker County?

A. I basically have said I want it to be built in a proper location.

Q. And I'm sorry if this gets into asked and answer territory, but I just want clarification. So you

are not opposed to it being built anywhere in Tucker County at this time.

Correct?

A. Again, I would focus on a specific location, and that's an industrial setting that's already established in the Mount Storm area, which is on the Tucker County and Grant County line.

Q. So somewhere in Tucker County, you'd now be okay with it.

Is that correct?

A. Somewhere is too general of a statement for me.

Q. Would you be okay with it anywhere in Tucker County?

A. Yes, if it were properly located.

Q. But you've made contrary statements.

Is that correct? In the past?

A. I've made statements that have evolved as my knowledge and my education to this particular subject has allowed me to better informed. So I came out neutral in the very beginning because I had no basis to be opposed to the power plant. But as I learned more about it and informed myself, I became --- I became an opponent of the power plant.

Q. Okay.

ATTORNEY DRIVER: Mr. Chair, I won't belabor this line of questioning. I'll pass over to the Intervener.

CHAIR: Mr. Walls.

ATTORNEY WALLS: Thank you, Mr. Chairman.

CROSS EXAMINATION

BY ATTORNEY WALLS:

Q. Mayor, isn't this plant going to be built right next to or behind a landfill?

A. It will be built right next to a landfill, which is apples and oranges, because the landfill doesn't does not emit the toxic emissions that you're talking about a major power plant emitting.

Q. Okay.

Is it fair for the record to reflect that you believe this power plant will affect tourism in the valley even if it never, ever, ever violates its air permit?

A. I think that the location that's being proposed is a deterrent for people that want to come and visit and be tourists in our area. I also feel that it is the basis for people not investing in the area. I've had

numerous phone calls from people out of the area that have said they want to buy property or houses in the area of Davis, and they're waiting to see what happens with the power plant. If the power plant gets built in the proposed location, they will not buy. They will not come to the area.

Q. And in addition to this plant being built next to the landfill, is it also --- is that old strip line property?

A. That strip mine property is absolutely the case. It's right next to the landfill, and it's less than a mile from the Town of Davis and the closest residence.

Q. I --- I understand that. And do you know how long ago that strip mine was --- was reclaimed?

A. I want to say it's probably been 30 or 40 years.

Q. And the Towns of Davis and Thomas were where they were now when that strip mine was in operation.

Right?

A. Correct.

Q. Yeah. In, I'm not --- I haven't been to the site. I'll be telling you, I've been to Davis and Thomas many times, and I've seen the site from aerial

photographs. But it sure seems pretty industrial to me. You know, you're on an old strip mine next to a landfill. Right?

A. That would be a true statement from the sense that a landfill is industrial. However, it's again, it's a focus on the emissions, not the aesthetics. It's the emissions that have people concerned.

Q. Yeah. And I want to go back to my earlier question, because I don't think I answered it, but maybe you did. Is it fair for the record to reflect that you believe the power plant will negatively affect tourism and economics in the valley even if it never, ever violates its air permit?

A. I think it would from the sense that it is a negative perceived facility operating in our tourist environment.

Q. And sir, you believe you're qualified to opine on whether or not Fundamental is going to violate its air permit in the future?

A. I would opine from the standpoint of, as I said earlier, just common sense, given their customer, given the need for 100 percent reliability of power production, that if they needed to throttle back, they wouldn't be in a position where they could do that.

Q. Have you had any experience in analyzing, evaluating power plants?

A. No, that's not in my wheelhouse.

ATTORNEY WALLS: I have no further questions, Mr. Chairman.

CHAIR: Any Redirect?

ATTORNEY BECHER: Nothing further.

CHAIR: You can step down. Thank you.

THE WITNESS: Okay, thank you.

CHAIR: What's Your next witness?

ATTORNEY BECHER: Dr. Ranajit Sahu.

CHAIR: Okay.

We are coming up close to noon. We'll probably want to break at noon. So I don't know how you want to structure your testimony with him since he's remote.

ATTORNEY BECHER: Yeah. Mr. Sahu --- Dr. Sahu is probably the longest witness.

CHAIR: yeah.

ATTORNEY BECHER: That --- that we have. I would suggest maybe we see how long it takes to get through voir dire and then considering break for lunch before we get into the --- the more substantive portions of his testimony.

CHAIR: All right.

Just be ware we're going to break when we're ready, so.

ATTORNEY BECHER: Yeah.

CHAIR: Okay.

ATTORNEY BECHER: And if, I mean if the Board would like to go further than that, certainly. All right.

Dr. Sahu, are you on?

MR. SAHU: Yes. Can you hear me? I'm on Zoom.

ATTORNEY BECHER: Thank you.

COURT REPORTER: Yes. Can you raise your right hand for me please?

RANAJIT SAHU,

CALLED AS A WITNESS IN THE FOLLOWING PROCEEDING, AND HAVING FIRST BEEN DULY SWORN, TESTIFIED AND SAID AS FOLLOWS:

THE WITNESS: I just want to make sure everybody can hear me. My --- my microphone is working, I want the confirmation of that.

EXAMINATION ON QUALIFICATIONS

BY ATTORNEY BECHER:

Q. We --- we can hear you just fine, Dr. Sahu. Thank you.

A. Yeah, thank you.

Q. And before we --- we get started, Dr. Sahu, can you state and spell your name for the record, please?

A. Sure. My first name is spelled Ranajit, I'm from India, R-A-N-A-J-I-T. I go by Ron. And the last name is spelled S-A-H-U, Sahu.

Q. Before we get to your testimony, I'd like to ask you a bit about your qualifications. Do you have a copy of the CV that was disclosed as an exhibit in this case with you?

A. Yes.

Q. Okay.

ATTORNEY BECHER: And if I may approach?

ATTORNEY GRAY: Is there an extra copy for the member that's on Zoom? Or can it be?

ATTORNEY BECHER: On Zoom? We submitted these through --- through Kenna yesterday to --- to give to Mr. Knee.

ATTORNEY GRAY: Okay.

ATTORNEY BECHER: Mr. Knee, can I confirm that you have the exhibits, including I believe it was labeled as prospective Appellant's exhibit, to Dr. Sahu's CV.

MR. KNEE: Is the mic on? I have them electronically.

ATTORNEY BECHER: Okay, thanks.

BY ATTORNEY BECHER:

Q. Dr. Sahu, I'd like to start with your educational background. Can you describe for me briefly your undergraduate studies?

A. Sure. I have a Bachelor of Technology from the Indian Institute of Technology, the IIT, in mechanical engineering. And that was in 1983.

Q. Did --- did that degree involve at all the study of power plants or air emissions?

A. It involved substantially the study of power plants and how power plants operate and how power plants generate power and the various types of power plants, turbines, engines, the more conventional steam power plants, all of that. At that time, it did not involve a substantial amount of issues dealing with the emissions from combusting fuels in power plants. But as a mechanical engineer, bachelor's degree involved, you

know, heat transfer and thermodynamics and combustion and how power plants operate.

Q. Okay.

And then did you go on after your undergraduate studies to pursue further education?

A. Yes, that's when I came to the United States. I came to a school called the California Institute of Technology, or Caltech, in Pasadena, California. I got my master's first in, it was --- it was in more aerodynamics and controls. And then I stayed on to get my PhD. That was in combustion, and specifically actually coal combustion, and dealing with the emissions and related issues from combustion. And I got that and graduated in 1988.

Q. Okay.

And during those degrees, your graduate degrees, did you have the chance to study air emissions?

A. Yes, substantially so in doing my graduate work. I had --- Caltech is a small school. You get to choose your area of expertise and your subject matter and your advisors. I had a couple of advisors. One was in the chemical engineering department and specifically on the chemistry and sort of the chemical related issues of air pollution. And then I had another professor who was

in the environmental science department who was my direct thesis advisor. And those almost all entirely air pollution related. And not just the formation of air pollution, but also the --- the impact and fate and transport of the pollutants that are emitted into the ambient air. And so that was a lot of my PhD or graduate work when I was at Caltech.

Q. And since receiving your degree, do you have relevant teaching experience related to power plants or air missions?

A. Yes. I --- separate from my work experience, I never was full time faculty. I decided to go into design first and then consulting. But for about 20 years, from 1992 to 2011 or 2012, I taught as adjunct faculty for a number of schools. I taught at Caltech upon leaving for several courses. But then I taught at UCLA, which is the University of California at Los Angeles. Taught at the University of Southern California, USC, another school here. Loyola Marymount University, at UC Riverside.

Adjunct courses on a variety of environmental issues, including air pollution. It wasn't all exclusively air pollution, but air pollution, risk assessment, dispersion modeling. All of those related issues were part of my teaching experience for about two

decades.

Q. Okay.

And your work experience, I know based on your --- your CV here, you've worked in several different positions prior to becoming an independent consultant. Can you talk about your work experience that --- that specifically involved dealing with air pollutants and air emissions?

A. Sure. The very first job I had, which was after graduating Caltech, was for a company called Kinetics Technology International, KTI. I'm sorry, HTRI, sort of a design firm, Heat Transfer Research Institute. That one --- that was more design of equipment. That particular job for about a year was not directly related to air emissions. It was more equipment design and equipment specification.

I then moved to KTI, the second job, and that was for design of equipment almost exclusively for air emissions and air emissions control. It was designing combustion equipment, large combustors, boilers and refineries and power plants and other types of chemical plants. And then the emissions impact of those, including pollution control technology, things like what has been called here, the SCR, the oxidation catalyst and

the reduction catalyst that will be used. Design of those type of pollution controls is what I did at KTI.

And then I moved and worked for a large engineering construction and AE, architecture engineering, construction company called Parsons for about ten years, from roughly 1990 to about 1999. And there I was working within Parsons, which was a very large entity, still is. In fact, it's headquartered in Virginia right now. They're a very large consulting air pollution and environmental consulting group. I worked in that group. And interfaced with the other parts of Parsons, which were more design, kind of work I had done in my previous work. But that engineering science was the entity within Parsons, that was the consulting arm. I stayed there for ten years doing consulting for a variety of Parsons internal clients, but also external clients, meaning engineering science clients. A lot of work with power plants, a lot of work with gas fired equipment during that period of time before I left to go on my own.

Q. And you say a lot of work involving gas fired power plants. Do you give an estimate of how much your work involved gas fired power plants or how many power plants you're involved with?

A. A lot of power plants. Parsons had a separate division dealing with power plants, not just gas fired, coal fired, landfill gas power plants, biomass power plants, variety of different fuels for power plants to generate electrical power for captive industrial operations, but also for the grid, what we would call electric generating units for the grid. So there were a number of Parsons clients that we had to deal with the environmental impacts. I couldn't tell you how many. It was in the tens to, you know, 20 or 30 in the ten years that I was there.

But engineering science on the consulting side had its own clients for air emissions measuring, for monitoring. In fact, one of the groups that I led was, under my overall charge was an air monitoring group at engineering science. And we did hundreds over the period of time that I was there of testing of power plant emissions using stack testing, using continuous emission monitoring. And some of those projects also were modifications to power plants or to add new turbines or new engines. So again, I would say, you know, projects wise, another 10 to 15, but testing for probably hundreds.

Q. Okay.

And I understand your current position is --- is listed on your CV from 2000 to present is --- is an independent consultant.

Is that correct?

A. Yes. I left just about the turn of the millennium, and I've been an independent consultant for the last 25 years.

Q. And can you describe your focus as an independent consultant?

A. The --- I have, as an independent consultant, I have my own clients. And I put them into three buckets. I've been asked this question before. I have clients who are what I would call private sector or industrial clients, much like I had when I was at Parsons. They can, they're small, they're sometimes, they're big. These are consulting assignments. They last from weeks to months to sometimes years. So they currently, for example, over the time period they've had, I've had clients in refineries. I've had clients in aerospace companies, in chemical distribution companies, all kinds of private sector --- and also land developers.

Then I have work that I've done consulting and expert work for government entities, including federal EPA and US Department of Justice for almost all of the 25

years. Some matters dealing with that. Several state agencies, local air pollution control agencies, state AG offices, for example. Some on consulting matters, some on expert either enforcement matters or other expert matters. And then the third bucket is what I would call non-governmental organizations. You know, what you would think of as, you know, community groups or larger environmental organizations like, you know, Sierra Club or Justice or NRDC or EDF, and also community groups.

I do technical work for all of my clients. And that mix, while it has varied over the years, I've had clients and continue to have clients in all three sort of groupings in my independent last 25 years.

Q. Okay.

And can you highlight for the Board some of the work you've done in your current role as an independent consultant that --- that involved air pollutant emissions, and if possible, air pollutant emissions from gas plants?

A. So a lot of the gas plant work in the last, let's say 25 years. But it has shifted over time. In the beginning, meaning let's say about 15 years ago, gas was becoming a bigger and bigger fuel for power generation. Mainly driven by shale gas and the discovery

of shale gas and the discovery of shales, so different types in different parts of the country, in Texas, in Pennsylvania, in Ohio, and other parts. So gas was becoming a bigger part of our power generation mix.

So several projects dealing with the emissions from gas turbines, much like at issue here, gas turbines are manufactured probably more commonly --- there are probably about 100 of them in the world, but about 15 or 20 active in the US. Smaller scale, you know, Calpine, Solar to the big three for the gas. Our industry for power, which is GE, Siemens, and Mitsubishi. Turbines of different sizes, frame turbines, air derivative turbines, different designs used to generate power. Simple cycle turbines which are the kind of turbines that will be used here. Or more cogeneration or combined cycle turbines with the steam turbine attached to a combustion turbine, all different configurations. So that was a lot of the work, let's say about 15 years ago, with more shale gas and the availability of that shale derived natural gas.

In the last five years or so, driven primarily by, well maybe five to seven years. It began with sort of the bitcoin, crypto, but then later on with AI and with data centers. The use of turbines more for industrial loads where either for crypto mining or for

data center powering with a grid component or even just captive to solely supply that load.

Broadly two types of power plants, either turbine fired or industrial engines, internal combustion engine fired gas plants. So those have been more active in the last, if you say five to seven years. I've done permit reviews for environmental agencies similar to here looking at state issued air permits. I have in a few instances done enforcement type of inquiries from my other governmental clients. A lot of issues dealing with not just quantifying emissions or assessing emissions, but also the implications of those emissions. A lot of my work has been regulatory.

This whole issue that has come up, I've been listening in this morning about minor sources, major sources, synthetic minors, area sources, classification of sources of different regulatory programs that might attach to them. And then a lot of modeling and dispersion impact analysis. Not just for --- for the type of issues like visibility and haze. I've done a lot of work in regional haze issues for my NGO clients, but also for criteria pollutants like nitrogen oxides or ozone that is formed secondary from those particulate matter and then air toxics which are more local.

Formaldehyde has been mentioned here. All of those aspects and then monitoring and recordkeeping.

Q. Thank you. And so would you say your education and experience has given you a detailed understanding of the --- the turbines that are used to run gas fired power plants?

A. Yes. I'm very familiar with the turbines and the technologies in the current generation of turbines that are used to generate that power and how they do that. Yes.

Q. And would you say that your education and experience has given you the opportunity to understand and quantify how emissions are produced by --- by those turbines?

A. Yes, and that is an extremely critical part of this, and that has great bearing on this. When you burn a fuel like gas, and as has been mentioned here, and I've heard this been mentioned as a gas power plant, but it is absolutely accurate what the mayor said earlier, which is a substantial amount of the emissions might come from diesel as a backup fuel or even as a choice of fuel, depending on pricing and economics.

The --- in any case, when you burn a fuel in a gas fired or a diesel fired power plant, these are

internal combustion engines. So this is a little different than burning a fuel like coal or even gas in a boiler in a steam generator. Those are external combustion, meaning the combustion time takes one to two, sometimes three seconds. I know that sounds short, but in the combustion world that's a long time.

In contrast, in turbines, the combustion has to happen on the order of tens to maybe at most multiples of tens of milliseconds. And that is a fast process, much like in your car. The combustion time is very short because of the internal combustion engines.

As a result, the formation of pollutants from the combustion can vary substantially based on many factors. You have a fairly short time in which to begin and complete combustion to generate the momentum in this case that will drive the work that is generated, which is the. So the combustion actually creates the hot gases that then drive the turbine, which creates the mechanical work, which then drives the generator, which creates the electrical power. The combustion has to happen very quickly. Fuel comes in, it's burned very quickly. These are all, current generation turbines are lean premix turbines on the gas side. And the load and the fuel composition and the ambient air and its condition, all of

that will dictate how pollutants are formed.

One crucial part that is maybe missed here is to recognize that not all pollutants are formed.

Q. And Dr. Sahu, we'll get into your testimony in a moment, but this --- this understanding of power plants, you know, I'm not asking necessarily to explain now how they operate, but would you explain how your work experience has --- has educated you to become an expert?

A. Sorry, I misunderstood my question. Your question? Happy to do that. Assessing air pollutants or their emissions is the heart of our entire understanding of air pollution regulation and everything that we do in air pollution. It all begins with understanding how emissions are created and how emissions are therefore emitted. So for every single air pollution project, if you will, and I've done, I've dealt with hundreds of them throughout my now 35 years. Understanding how those emissions are created is at the heart of the. It begins there.

Because without understanding that, you don't know how a source should be classified from a regulatory standpoint. And how those pollutants that are emitted will then behave in the atmosphere. It's called their fate and transport. It's been called modeling here,

their fate and transport. Or how their impacts will then be felt, whether it's on human health, on the environment, on disability. So the understanding in which is ---.

ATTORNEY YAUSSY: We're going to object. I mean he's testifying now. We're really looking at --- at whether he's qualified to offer that testimony.

ATTORNEY BECHER: And --- and let me.

BY ATTORNEY BECHER:

Q. So you had said you had, I think, hundreds of opportunities to evaluate and understand how this combustion happens and how these operations affect emissions.

Is that correct?

A. Yes.

Q. Okay.

And similarly, has your experience allowed you to gain an expert understanding of pollution controls that are used for these devices?

A. Yes. I mentioned earlier, even just getting out of school, I was involved in pollution control designs very similar to what I proposed here in this particular matter. But yes, generally speaking, almost all of our pollution sources that are permitted today in

the last several decades have some type of pollution control. Very few are emitted unabated, if you will, directly. Some are, but not always. But ocean controls are part of the, if you will, the modification of the pollution that is generated before it's emitted to the atmosphere. So that is part of the emission analysis is the pollution control and how that behaves almost on all of these projects.

Q. And we're closing in on the end. And just again, to focus on your qualifications, just will you briefly, in a few sentences, describe to me generally what you were asked to do for purposes of the current appeal?

A. Well, I think I was asked to look at the record here, and particularly whether the portions that had been redacted would affect how one might analyze the --- the project. In other words, how the redactions affected or provided sufficient or insufficient information to allow the DEP and to allow, certainly the public to know how the plant would create its emissions and how it would be, in fact, in compliance with its stated minor source or synthetic minor source classification. In other words, that was one.

The other is to the extent the data was

available and unredacted, how those potential emissions that had been stated in the application were sufficient or correct to make the plant operate as a synthetic minor source. I understand that it is the choice of the applicant to call itself a synthetic minor source. That's a preference, that's a representation. So I was asked to look at, well, can this in fact be verifiably run and operate as a synthetic minor source? Not just saying that we are, but can you actually demonstrate that? So that aspect. And that verification, of course, relies on how the permit accounts for things like testing and monitoring.

Q. Thank you. And --- and again, just briefly, can you --- can you describe for me how your past education and work experience allows you to do that?

A. Well, each of the past projects in air pollution begins with air pollution emissions analysis, the inventory, if you will. What is emitted, in what quantities, and how those are estimated. That is really the heart of the emission inventory quantification. And so here, a lot of that type of work is at the heart of every air pollution project. So all of the hundreds of air pollution projects that I've done have involved that starting point.

So that gives me the ability to begin in the same place here, to answer the questions that I was asked. And that's when the redactions did not enable me to do that, and therefore I had to stop and sort of ask questions that, you know, how --- how is one supposed to, as a member of the public, get beyond that starting block?

Q. Thank you.

ATTORNEY BECHER: And I would offer at this time ---.

THE WITNESS: And if I can add one more? I would also say that it is somewhat --- it is unique, quite frankly, as I've been thinking and looking at it. In the last five years, I've looked at several permits from this type of application, whether it's crypto mining or data centers. I cannot remember an instance, and some very controversial just from several standpoints.

ATTORNEY DRIVER: I want to, I just --- I've got to jump in here real quick. I think we're getting into something that can be classified as testimony and we've got a protective order in place for that.

ATTORNEY BECHER: Yes.

THE WITNESS: Thank you for reminding me.

I was simply going to say that the redactions were not part of those applications, Mr. Driver.

CHAIR: Okay, go ahead.

ATTORNEY BECHER: Thank you. I'd like to offer Dr. Sahu, who is an expert in the combustion and generation of air pollutants, the control of air pollutants, and the calculation of emissions.

ATTORNEY DRIVER: And I've --- I've got a few questions, Mr. Chairman.

CHAIR: Wait, wait. Hang on.

ATTORNEY DRIVER: First of all, Dr. Sahu --- go ahead.

CHAIR: Hold on, stop. Wait, wait.

ATTORNEY DRIVER: I'm sorry.

CHAIR: Wait one minute. Repeat again what you're asking.

ATTORNEY BECHER: Yes. Qualification as an expert witness in the combustion of fuels generating air pollutants, air pollution emissions, and the calculation of potential air pollution emissions.

CHAIR: Okay.

Now Mr. Driver, go ahead.

EXAMINATION ON QUALIFICATIONS

BY ATTORNEY DRIVER:

Q. Okay.

Dr. Sahu, I'm going to ask you some questions that I'm sure as an expert you've been asked before. What is your hourly rate?

A. My hourly rate right now is $300 an hour. I adjust that periodically. But for 2025, for this work.

Q. And I do not want to know your total income, but what percentage of your income would you estimate that you derive from expert testimony or litigation systems?

A. I have been asked that question, you're right. It does vary over time. In other words, depending on the time period, it has ranged from a low of about 20 percent to a high of probably even 75 percent depending on if there are active matters going to trial and so on.

Q. Are you familiar specifically with the West Virginia state rules regarding determination of confidential business information?

A. I'm not a lawyer, so I couldn't speak to the legal aspects of that.

Q. Okay.

I was just --- I just wanted to know if you

were familiar with the criteria for whether or not something is properly classified as CBI. It sounds like you're telling me no.

Is that correct?

A. Let me clarify. I --- I know what is in the record. In other words, the representation made by Fundamental Data and how the DAQ has responded to that. I'm familiar with that, but not beyond that meaning independently doing any legal research is what I meant to say.

Q. Okay.

Thank you. And are you familiar with the rules for the air permitting review process under the West Virginia rule specifically?

A. That I have. I've done several projects helping in West Virginia, and so I'm familiar with that.

ATTORNEY DRIVER: And Mr. Chairman, to the extent that Mister --- gosh, I'm sorry. Dr. Sahu would offer testimony about whether or not the CBI determination was proper, that I will object to. I do not object to him testifying as to the specific expertise that was offered by Counsel just now.

ATTORNEY BECHER: And I would respond to that objection. I think that part of the confidential

business information is whether these. Whether this redacted data goes to the frequency, type, amounts, concentration of pollutants. I --- I think he can testify about the redactions and what you can and cannot calculate based on those redactions. I'm not going to ask any legal opinions, but I think he can form the factual basis for my legal arguments on those issues.

CHAIR: I think we can address those when we get to that point of testimony. And you could raise your objection at that point, Mr. Driver, if it doesn't fit.

Okay?

ATTORNEY DRIVER: Okay.

And holding that reservation aside, I have no objection to Dr. Sahu's technical qualifications as an expert.

CHAIR: Intervener, Mr. Walls?

ATTORNEY YAUSSY: I'll --- I'll be doing it.

CHAIR: You're going to do this? Okay.

ATTORNEY YAUSSY: They're going to let me talk now.

EXAMINATION ON QUALIFICATIONS

BY ATTORNEY YAUSSY:

Q. Dr. Sahu.

A. Hi. I can see other different people here. So I can't --- got to start getting my bearings. It's a little hard to see everybody, but I can see you. Yes.

Q. Doctor, you got a PhD in coal combustion technology.

Correct?

A. No, that was the subject matter of my PhD. The PhD was granted in mechanical engineering.

Q. Okay. Okay.

It looks like from your CV that you spent a lot of time working in coal combustion early on in your career.

Is that fair?

A. I did. That was my PhD work. I published in that in the beginning when I left grad --- grad school. That's correct.

Q. How much? In looking through your --- your record here, your teaching experience appears to have largely ended around 1996 or so, except for some later courses with, at Caltech in 2005, Loyola in 2006, and some at UCLA in 2009.

A. Yeah, they began in 1992 at Loyola Marymount and UC Riverside. And I think the last courses I taught were in 2011. It was about --- about two decades, yes.

Q. Most of the time was front loaded on that as far as the years though, correct? I mean those were, tend to be?

A. I was doing more teaching in the beginning, but it continued throughout. There were, you know, I taught at UCLA and USC. Sometimes overlapping, sometimes continuously. I also mentioned other schools, Cal State Fullerton. But the --- the number of courses I taught at any given time may have fluctuated. But they all happen in that two-decade time period.

Q. As I look at the publications, you say it's a partial list.

A. Yes.

Q. But of those listed since 1994, you've only had two publications since --- since 2001. Is that --- be about right?

A. Yes, and I can clarify that. I stopped publishing once I realized I didn't want to go to academia. You know, publishing is an important part of being an academic. I wanted to go to consulting, and so I did not publish --- I've made lots of presentations.

They don't rise to the level of peer reviewed publications. So I call that a partial list, and I don't list them. But I, a lot of my work is subject to, you know, clients who have different matters and doesn't allow me enough time to go out and write papers like I used to or I could if I was in academia. So it's a partial list. There are some publications after that, but not what I would have had if I stayed in academia.

Q. You mentioned presentations. It looks like according to your resume, your CV here, there's been no presentations after 1994. Would that be about right?

A. I just don't maintain the record. That's why I call it a partial list. I just don't keep up that.

Q. The reason for the questions, Doctor, is you indicated to Mr. Driver that 25 to 75 percent of your time was spent up in testimony, I --- I'm assuming as an advocate for one side or another on litigation or administrative proceedings?

A. Yes, it is. And on that, my resume is pretty thorough. If you look at the list of the expert matters, I do maintain that. And that's in the regime. That's correct. So the different matters I worked on are listed there.

Q. It's extremely thorough. And it appears that

at least, you know, 75 percent of your time was spent as an advocate for one side or the other and litigation or administrative proceedings based on what I see here. That sounds like that more, goes more to 75 percent than 25 percent?

A. Okay.

I --- I --- I'm not even facetious about that, but yes, in every matter that I've represented somebody, it's been one side or the other, not both at the same time. But --- but I can assure you that yes, but it has within that a variety of different clients. Some governmental clients, some NGOs that I mentioned, some industrial clients. That's --- that's fair.

Q. Fair. Fair enough. You've been paid to advocate?

A. Well, that's how I make my living. And I --- I have done some pro bono work. That's, they're probably listed there, but what I can.

Q. Okay.

Doctor, looking through this list of litigation support, I only saw one place where there was anything mentioned about gas turbines. Have you testified or have any testimony with regard to gas turbines?

A. No, there have been less litigation that I've

been involved in on gas turbine where that was the issue. A lot of that has been regulatory or permitting work, consulting work, not expert work in gas turbines.

Q. When you talk about having been involved in gas, gas power generation, has all that been turbines or some of that been direct heat the same way you would have direct heat with coal?

A. It's been both. Some have been, I think I'll go with the direct heat, which is still combustion. But the distinction is they're not just, they're more steam turbines. In other words, we generate the power using a steam turbine. It's a different thermodynamic cycle, but off --- like I mentioned in the last decade, a lot of internal combustion, or gas being, turbines, being part of that, combustion turbines is how --- how I would call them, aeroderivative frame.

But also some engines. Engines are often used, internal combustion engines, rich burn, lean burn engines. So it's a mix of those.

Q. Okay.

So you're talking about, so you'd have some experience with direct burn, and you'd have some with internal combustion, reciprocating engines, and some turbines?

A. Yes.

Q. How much of your time overall, all of your, the work you've done in the past ten years has been on gas turbine engines or something directly related to that?

A. That's a very hard. I haven't thought of it that --- that way. I mean I have projects almost every year on this. But as to the time in relation to everything else, I --- I couldn't tell you. I really, you know, there are sometimes, you know, for a month that's all I'm doing. But when I look at it over ten years, am I looking at gas driven work every day? Probably not, but it is projects that come and go. I can't tell you a percentage offhand. I would be wrong.

Q. But you'd agree with me that at least in your CV there's not much reflection of gas turbine works?

A. Well, that's a reflection of how the CV's written. The CV is written to be thorough with my expert work because that's required in court. But the CV does not list every consulting matter that I work on. So in other words, some CVs are written with every consulting assignment or. I --- I don't have that listed. That would be many, many more pages. So that's why it looks lopsided as I'm talking to those as opposed to listing every consulting, non-litigation matter that I've worked

on.

Q. Can I assume that your experience as far as consulting on gas turbines is, would be the same amount of time as you spent testifying about gas turbines based on your CV? Just trying to ---.

A. No, that --- no, that's incorrect. I said a lot of that has been permit reviews and regulatory work without getting into litigation. So that would not be with turbines.

Q. But you couldn't give me an idea of the amount of time?

A. Well, I --- I would say if you had to, if --- I'm just guessing here because that's an educated guess. Over the last ten years, probably about 20 to 30 different projects on gas turbines, not, you know, reciprocating engines or the direct heat type of work.

Q. Okay.

Have you worked with the gas turbine manufacturers themselves? Have you consulted with them?

A. I have not consulted directly for the, what I call the three major big three, so Mitsubishi, Siemens, and GE. I have interacted with them, otherwise I've not worked for them. Earlier on, when I was with Parsons, we had clients who were turbine manufacturers, but there was

not --- when I was independent, I was part of Parsons.

Q. You mentioned in talking with --- with your attorney that you're familiar with synthetic minor permitting?

A. Yes.

Q. And because you had questions about the synthetic minor permit, which we're going to get into, but I'm just trying to find out whether you're saying that --- that you couldn't qualify a turbine or a set of turbines as a synthetic minor?

A. No, what I'm saying is a project, it's not just a turbine. All the air emission sources in a project, depending on their potential to emit, you can either have three possibilities, right Counsel? One is a true minor. That means you're below the major source thresholds. And those are thresholds in plural because they're different for criteria and hazardous air pollutants. Or you're a major source, which is clearly greater than the threshold for one or more. Or you are the latter, meaning you're a major source, but you choose to take enforceable conditions to become a synthetic minor even though you would be a major source. So that's the classification.

Q. You, as I understood from what you were saying to Mr. Becher, you said that the redacted data in this

case is needed to determine compliance with the permit.

Did I understand that?

A. In part, but it's also the fundamental understanding how those emissions that are summarized in the non-redacted portions came to because those rest on assumptions and calculations. And there were, without that, they're just numbers on a page, literally.

Q. Okay.

So you're ---.

A. So --- no, no go ahead. I didn't mean to interrupt you.

Q. No, no, please, go ahead.

ATTORNEY BECHER: And I'm going to object to the ---.

CHAIR: No, let's stop here because I get, we're --- we're starting to get into evidence and testimony. Let's keep it to the credentials and we can bring it up later.

ATTORNEY YAUSSY: It might shortcut this. I under, if I could clarify with --- with opposing counsel that Dr. Sahu's not being offered as any kind of expert with regard to whether the. Whether the CBI was properly granted and just whether it's necessary in order to determine compliance with the permit.

ATTORNEY BECHER: He --- he is not going to offer legal conclusions about the CBI. He will offer factual testimony regarding what you can and cannot determine from the redacted permit.

ATTORNEY YAUSSY: Okay.

I'll accept that.

CHAIR: All right, so.

ATTORNEY GRAY: Make sure Scott's okay with that.

CHAIR: Scott, are you okay with that?

ATTORNEY DRIVER: I am, Mr. Chairman.

CHAIR: All right.

ATTORNEY YAUSSY: So we're going to object to his qualification as an expert in turbines since he doesn't have that extensive of an experience working with them. But as far as his ability to calculate air pollutant emissions generally, he seems to establish that. But not for turbines in particular.

CHAIR: But that was not part of what he would be certified.

ATTORNEY BECHER: I --- I believe that the familiarity with turbines is part of that. His primary role is going to be to explain the air emissions calculations coming from these turbines.

CHAIR: Okay.

So again, repeat what you --- the three things you wanted.

ATTORNEY BECHER: I --- I would like him, sorry I --- I --- I should have written these down as I was speaking. An expert in the combustion and generation of air pollutants.

CHAIR: Stop there.

ATTORNEY BECHER: The ---.

CHAIR: Is there a problem with that? Wait, wait a minute. Is that terminology all right with you?

ATTORNEY YAUSSY: Well, I mean that's incredibly broad. I'm not sure he's established an expertise as far as turbine emissions.

ATTORNEY BECHER: Okay.

May I Redirect?

CHAIR: Yeah.

FURTHER EXAMINATION ON QUALIFICATIONS

BY ATTORNEY BECHER:

Q. Okay.

Dr. Sahu, can you give me an estimate of the

number of projects you've worked on calculating air pollutants from turbines as we're --- we're speaking about? Gas --- gas turbines.

A. Probably 50 to 100.

Q. Okay.

Over what period of time?

A. If you look at Parsons plus my own work.

Q. Okay.

Fair --- fair enough. So that's going back to your pre-independent consultant experience?

A. Yes.

Q. And --- and you say ---.

A. Well, for independent, but I was still consulting, but with a different entity than I'm on my own. But turbine emissions and how combustion happens in them has been part of that probably about 50 to 100 times.

Q. And you worked specifically with turbines when you were at Parsons?

A. Yes, I mentioned that we had plan clients who were turbine manufacturers, who were projects that were gas turbine. They were mainly for power at that point, for grid power. But then later on the fuel mixes changed, and there was some gas back then overseas, not

so much in the US. US was mostly coal. But in my own work, almost all of it has been gas since, for about 15 years.

Q. Okay.

Let me ask too, is part of your consulting experience writing and drafting comments on --- on regulatory issues?

A. Yes.

Q. Okay.

A. I've done a lot of that.

Q. Have any of those recently involved gas turbines and emissions from gas turbines?

A. Yes, they have.

Q. Can you give an example?

A. And that also involved commenting on rulemaking specifically with gas turbine new source performance regulations, the NESHAP regulations that EPA has proposed. All of that.

Q. Okay.

So you've been involved in --- in those NESHAP source review regulations, evaluating and commenting on those for clients?

A. Yes, and directly interacting with EPA staff who are rule writers, including on Zoom calls and

explaining technical issues relating to that as part of public comment. All of that.

Q. And does that require you to have expertise and knowledge related to natural gas turbines?

A. Yes, very much so. I wouldn't be credible to provide deep technical comments on NOX emissions, formaldehyde emissions, particulate emissions without that fundamental understanding, including how they modified bio pollution controls, all of that.

Q. Thank you.

CHAIR: Okay.

I think that, as you said, the question was a little broad, but that's all right. What we're going to do is allow you to have him as an expert witness on the three issues you raised with the idea that if he gets into things that are too technical on the gas turbines, you can raise an objection at that point.

ATTORNEY YAUSSY: Okay.

Thank you. Thank you, Mr. Chairman.

CHAIR: All right.

So we'll certify him as an expert witness in those three areas there.

ATTORNEY BECHER: Thank you.

CHAIR: Okay.

And with that, we're at noon, so we're going to take a break for --- for lunch.

ATTORNEY GRAY: One quick. At what point will we be getting into the confidential information? Are you going to start out with that?

ATTORNEY BECHER: No.

ATTORNEY GRAY: So I'm just trying to figure out at some point once we reconvene, we're going to have to ask the public to leave the room. I'm trying to, for purposes of the public and the Board, trying to get a feel for how fast our timetable that might work.

ATTORNEY BECHER: The, I think the most accurate I can give you is based on the proportion of my script. It was 14 pages long. Two pages of that were voir dire. I believe the next. Well up to page ten, so eight pages is going to be based on unredacted. And then four and a half to five pages based on the ---.

ATTORNEY GRAY: So maybe an hour after we reconvene before we get into the confidential part?

ATTORNEY BECHER: That's --- that's a fair estimate.

ATTORNEY GRAY: I think we can.

ATTORNEY DRIVER: And John and Mr. Chairman, just because of the nature of expert testimony,

I worry that there may be some commingling of redacted and unredacted data. If that comes up, I will probably jump in. I wouldn't call it an objection, but probably a reminder that we have the protected order. I --- I worry just because it's a commingled issue and we may --- we may get out from between the guardrails. I'll jump in whenever I think that's happening.

ATTORNEY GRAY: Well, I'm just going to ask the lawyers, including myself and others, to be mindful. And as soon as anybody feels like we're treading on thin ice to slow or stop the process down in order to make sure we don't violate the protective order.

ATTORNEY YAUSSY: Thank you.

ATTORNEY BECHER: Thank you.

CHAIR: All right.

So let's take a break, break for lunch. Half --- half an hour work for you all? Okay, half an hour so we'll reconvene at 12:40.

(WHEREUPON, A SHORT BREAK WAS TAKEN DURING THE PROCEEDING.)

COURT REPORTER: Court Reporter. Sorry for the technical difficulties. Do you just want the

same transcript order as the first part of the hearing on the 5th?

ATTORNEY DRIVER: Yes, please.

COURT REPORTER: Thank you, thank you.

(WHEREUPON, A SHORT BREAK WAS TAKEN DURING THE PROCEEDING.)

CHAIR: All right.

I think all the parties are back now, so we'll go ahead and reconvene. Mr. Becher, you have your witness. I hope --- I'm hoping he's still there.

ATTORNEY BECHER: Dr. Sahu, are you still present?

THE WITNESS: I am. Can you hear me?

ATTORNEY BECHER: Yes, thank you. Before we get to that, I --- I realized over break that I had neglected to seek to introduce Dr. Sahu's resume as Appellant's Exhibit 1.

(Whereupon, Appellant Exhibit 1, Sahu Curriculum Vitae, was marked for identification.)

CHAIR: All right.

We'll enter that then as Exhibit 1.

(Whereupon, Appellant Exhibit 1, Sahu Curriculum Vitae, was admitted.)

DIRECT EXAMINATION

BY ATTORNEY BECHER:

Q. And Dr. Sahu, do you have a copy of the certified record in front of you? I'd specifically like to ask you to go to the redacted Section N of the permit application, which I believe begins on page 55.

A. I have it electronically. Let me go there. Yes, I am there.

Q. All right.

First, I'd like you to look through this document and tell me if this is something you've carefully reviewed in preparation for your testimony today.

ATTORNEY DRIVER: Mr. Chairman, is the courtroom cleared for this part?

CHAIR: No.

ATTORNEY BECHER: This is the redacted

portion.

ATTORNEY DRIVER: Okay.

I'm sorry, I thought you said unredacted and immediately flipped out. Sorry.

CHAIR: That's all right, you're allowed.

ATTORNEY BECHER: And I hate to ask this, but is there any way I can get Dr. Sahu's view up on --- on the screen?

MS. DERAIMO: Oh, yeah. Sorry. I just pinned it for her. Thank you for pointing that out. When he talks, he will come up.

ATTORNEY BECHER: Great.

BY ATTORNEY BECHER:

Q. So Dr. Sahu, is this something you --- you've reviewed closely in preparation for your testimony?

A. I did.

Q. Okay.

And is it your understanding this was part of the application that was submitted with the, well, this is part of the permit application submitted for the permit of this facility?

A. Correct.

Q. Okay.

And I'd like to go through some of the tables

in this exhibit. Can you first turn to page 56?

A. Sure.

Q. Okay.

And you'll see, I believe, in the table on the left hand column, pollutants both hourly and annual?

A. Yes. There are three tables on the page. The first is just identifying information, including the consultants that prepared this. And this is for when the fuel is natural gas, as is stated at the very top. And then yes, there are two tables below with the same list of pollutants. One, the upper table for the hourly emissions, and then the lower one for the annual tons per year emissions. That's correct.

Q. Okay.

And then beside that, there is a big, black box that --- that was redacted that we cannot see?

A. Yes. The black is the redactions in both tables, both the second and third tables.

Q. And then we see a column labeled total turbines.

Do you see that?

A. You cut out there. You said total turbine? Yes, I see that.

Q. Yes. And what, what in your opinion, or what

in your understanding, do these numbers represent?

A. Well, in the upper table, meaning the two redacted tables, the table at the top, that one says total turbine emissions. Meant that however many turbines there were, this is the sum of the hourly emissions from those turbines.

Q. Okay.

And below it, the same for annual emissions, the sum of all the turbines?

A. Yes, those are the annual, but there is now a restricted term there. But that in some fashion has been restricted. And then it is the total of those. There is some designation of the, you know, the title there, if you will, of the --- but that's been redacted. But I'm interpreting that as the. However they were restricted annually, this is the sum of all the turbines that are present.

Q. Okay.

And is --- is it your understanding? Well, we can take a look at the footnotes if that's helpful. That these represent a certain operational state of the plant?

A. Yes. The second table, the last table here with the annual numbers, there's a --- there's a column to the right of the total restricted turbine, which is

the turbine startup shutdown emissions. And that only has entries for two pollutants, just nitrogen oxides, or Nox, and carbon monoxide. And it has blank for all the other pollutants. But this --- that raised a whole host of questions. But --- and it wasn't clear, you know, if that is the total for all startup shutdowns. Just a number of questions. I will mention that at this stage.

Q. Okay.

A. But yes, the only three footnotes that clarify this entire page are at the bottom.

Q. And just to clarify. So then this table, is this for operation with --- with either gas or diesel, one or the other?

A. This is, as I mentioned, the very top. This is just for gas. This page is just for gas.

Q. And so here we have the --- the total turbine emissions per hour. Would you agree? We cannot see the number of turbines that that includes?

A. I would agree with that.

Q. And then for the annual emissions figures, we just have the total projected emissions for all of the turbines running at a steady state in that first column after the black box?

A. That's the 94.43 and numbers that are populated

below that. But then the startup shutdown has an additional, as I mentioned, only emissions quantified or listed for two pollutants. Those are listed in the column next to it. The 4.54 for NOx is the non-steady state because shutdown is not steady state.

Q. Okay.

And this table doesn't provide us any information about how that startup shutdown number is calculated?

A. It does not. What this table does confirm though is the sum of the two off to the right is 98.98 tons for Knox, which I think as far testimony has elicited, is literally a shade below the 100 ton per year major source threshold. And I have some concerns about verification of that and we can get into that later.

Q. Okay.

Great. And if you flip to the next page, page 57.

A. Yes.

Q. We see similar data for diesel?

A. Yes. Here the fuel is diesel at the very top and similar structure for the most part as the previous table. Correct.

Q. And again, we don't see ---?

A. And here too, I'm sorry. Here too for the startup shutdown, even with diesel, there is just quantification for two pollutants and blanks for all the other ones in the annual table.

Q. Okay.

And again, we --- we don't know anything about the number of turbines here?

A. We do not.

Q. So we don't know how many turbines are operating to get these --- these total hourly emissions?

A. Yes, we don't know how many are being issued on an hourly and more questions on the annual.

Q. Okay.

And then let's turn to the next page, page 58.

A. Fifty-eight (58), yes.

Q. Okay.

And here there are a number of tables. If we look at the second one, we see again that the number of turbines is redacted?

A. Yes, this is supposed to be the detail page for natural gas. In other words, we saw page 56 was sort of the summary page and then there was a summary page for diesel. And now this is the one and only detail page for natural gas as confirmed by the, at the top. And then

yes, there are a number of redactions in under the assumptions table, which is the second table on this page. That's correct.

Q. And so here we can't tell again how many turbines there are?

A. Correct. We cannot.

Q. We cannot tell how many startups or shutdowns they're assuming?

A. We cannot because that's in the third table, the short table that says startup, shutdown emissions. The per event numbers are blacked out, but there is a total for tons per year. Same numbers that were carried over to the other summary table. But how many there are and the durations of those, none of that is. Can't get any of that detail.

Obviously loads have been assumed, you know, how many under what conditions of load and what even startup means, meaning when does startup end and how long startup is envisioned to last and how many there are per year. None of those details can be listed.

ATTORNEY YAUSSY: Mr. Becher, my apologies. You're on page 58 of the record?

ATTORNEY BECHER: Fifty-eight (58) of the record.

ATTORNEY YAUSSY: Okay.

THE WITNESS: Number page 58. Yes. It's just off by one for PDF.

BY ATTORNEY BECHER:

Q. And --- and again, if we look down to the biggest table there, we don't have any information on what any individual turbine would produce in terms of either hourly or annual emissions?

A. Correct. That part is redacted. And then the numbers are on the other ones are the same as the summary table.

Q. And then if we turn to page 59, we see a similar table for operations under diesel?

A. Yes. I should also say there's a table below on this previous page for uncontrolled steady state, but only for two pollutants, for NOx and carbon monoxide.

Q. Okay.

A. But none of the other pollutants. But yes, then there's a reduction on one of the notes fields and then on the next table similarly for diesel. Correct.

Q. Okay.

And if --- if you turn to the diesel again, we see again no information on the number of startups and shutdowns?

A. Correct. Same for event is blacked out and no details on what that would mean in terms of the details of the startup shutdown crucially for the load as well as for duration.

Q. And no information on the number of turbines?

A. Correct.

Q. And so the only information we have is the cumulative projected emissions if all the turbines are running in a steady state?

A. And whatever is defined as steady state. Steady state, from an engineering perspective, nothing in the real world operates at steady state. Literally means operating without any change in time or no fluctuations with time. It's an idealized sort of aspirational goal. But yes, other than simply noting that these emissions might refer to steady state, there's more detail on what steady state means.

Q. If I can now have you turn to the --- the permit itself. And I believe that begins on page 485 of the certified record.

A. Let me just get there. Yes, I am there.

Q. And did you review this --- this permit as part of your preparation for testimony today?

A. I did.

Q. And I'll have you turn to page 497 of that document under source specific requirements.

A. Give me one second. I'm just scrolling through. I have it opened electronically. 497, did you say? Yes. I am there.

Q. Okay.

And would you agree that this page limits the maximum hourly? And then on the next page we see limits to maximum annual emissions?

A. Yes, you're talking about Section 4.1.3. There are two tables, one for natural gas and one for diesel. And that does have the maximum hourly emissions listed there.

Q. And if we look at 4.1.4 and 4.1.1.5, we see aggregate annual emissions for natural gas and diesel in 4.14 during startup and shutdown?

A. Correct. These are the same exact numbers that were in those redacted tables we we're looking at from Section N of the application.

Q. Okay.

And again, if we go to 4.15, we get the aggregate total emissions from the combination of all the turbines running at steady state?

A. Yes. The one difference here being all the

turbines on an annual basis running on either mix of fuels.

Q. Okay.

A. So there are not two separate tables because there will be some in a given year using natural gas and some diesel. The totality of that from either fuel is listed in that table on 4.1.5. Correct.

Q. And under 4.15, we see hourly limitations on natural gas operations exclusively?

A. Those are the hours only. These are not emissions. The total number of hours under 4.1.5(b) is listed. And similarly, there's a number for the total assumed hours under diesel operations. I will note that neither one of these has any restrictions or notations, but the load, just the total hours.

Q. Okay.

A. And when I say load, I mean the percent of full design. And I keep harping on that because that has great bearing on emissions.

Q. Have you reviewed? If we go to the next two pages, I think we can see the full list. But have you reviewed the monitoring testing requirements for this facility?

A. I have.

Q. Okay.

Is there any direct monitoring required of the actual pollutants being emitted from this plant?

A. No. Other than a stack test, there is no continuous or ongoing direct measurement of the mass of emissions, which we, I think has come up before, called continuous emission monitoring. We measure the exhaust gas flow and the concentration of different pollutants. There is not such a requirement in the code.

Q. Okay.

So how do we tell if or how would --- how would one tell if those hourly or annual limits will be exceeded?

A. Well, the short answer is you cannot. And that's the whole problem with this permit. I --- I heard before that what's the big deal? We know we're going to do a test, and we will have a measurement during the test of the hourly emission rate. And then we know the number of hours that we're going to run. You just multiply one by the other and voila, you have your number. It's just arithmetic.

It doesn't work that way. Because no matter what test condition you do, it will be done at a certain load. Whether it's 100 percent, 99 percent, 90 percent,

you name it. Those emissions, number one, will not be the same from turbine to turbine. I can tell you that, or even by run to run, there's fluctuation. And then they will certainly not tell you what those emissions are for other loads, for other conditions, including startup shutdown. So you --- there's therefore no way to, unless you simply make that assumption that your test done, whenever it's done, will tell you everything there is to know about those hourly emissions, which you can then track based on just tracking the number of hours. It just doesn't work that way. That's the problem.

Q. And is that because those calculations, even to know what the total annual emissions would be, or the total cumulative emissions would be are redacted?

A. Well, it's two things. That redaction is very important for that. Exactly because you can tell us what sort of conditions are being assumed. Or even what assumptions were made. Really, the redactions would tell us what assumptions were made in developing these calculations and how realistic those are for operating the planet.

The bigger problem, including the redaction, is that the permit takes a simplistic view that if you just measure one time or even periodically, very infrequently,

the hourly emissions and all you're doing is tracking the fuel consumption or the hours, you automatically, by arithmetic, can show compliance with your annual limits. And those annual limits, at least for NOx, are extremely, have no margin really. They're sort of slightly below 100 tons. And so that's the structure or the architecture of the permit. And that's the problem.

Q. Let's say, for example, that we have less than the full component of turbines running on diesel for a number of hours.

A. Yes.

Q. Can you determine if it's less than the total number of turbines, what the emissions would be from --- from those turbines based on the information in the redacted portions of the permit?

A. I cannot because I don't know the total number of turbines. So if I have some fraction of that, I have no idea. And --- and going beyond that, I don't know what loads these different turbines will be operating. Because you're going to use diesel for sure during startup. That's already noted. And you'll use some gas during startup, quite frankly. That's noted. But the loads are important. The emissions that are going to come out depend on the load. So without how many which

are redacted and on the loads, you cannot tell.

Q. And we know that the diesel hours are limited if they operate exclusively on diesel.

Correct?

A. Yes, there's that 25,000 aggregate hours where diesel can be used and then the 61,000 and change hours when natural gas can be used. Correct.

Q. So we've got the hourly limitations. We know the maximum they can use if they're both operating at full capacity under either fuel type independently.

Correct?

A. Those are the limitations of the hours and, correct.

Q. Is there any way to know what the emissions would be if they were operating sometimes on gas, sometimes on diesel with less than full component turbines?

A. No, we cannot. Not from the redacted version. Not just for the number of turbines that might run in that configuration is not known, but equally importantly what the loads will be for those turbines. And here I --- I should stress, and I think I've been meaning to do that. Is it is not accurate at all to say that your maximum hourly emissions will only happen at full load,

at 100 percent load.

Q. Well, let me --- let me let you explain that. Why --- why would you get? Why would you get more pollutants if it's not operating under full load?

A. Yes, and that's the crucial part of this assumption here that is wrong. Internal combustion engines, these gas turbines are internal combustion engines. The way the pollutants are formed are different. So NOx is an example of a pollutant, oxides of nitrogen, which are formed typically at high temperature in the presence of oxygen and nitrogen. You will get higher and higher NOx levels as the load increases. So for NOx, it's a reasonable assumption to say if you test at 100 percent load, you might get the highest emissions being developed in the turbine itself.

But remember, you also have an SCR catalyst which purpose is to reduce that NOx that you created. And that SCR catalyst only works if it's warmed up, meaning above a certain minimum temperature. It is a reasonable assumption to say that at maximum load, while you have highest NOx emissions, your SCR is operating as well as it can. And the combination of that will give you the emissions that you measure.

But take a different pollutant or a different

class of pollutants, take carbon monoxide or even formaldehyde. Those will not be created the same way as NOx. Those are products of incomplete combustion. As you go to more and more --- as you go to less and less load, the combustion process is not as efficient and you actually get more carbon monoxide, more VOCs, more formaldehyde, more of a whole number of hazardous air pollutants at lower loads. Just even as they're formed in the turbine.

And then their respective pollution control, which is an oxidation catalyst. Which also requires the minimum operating temperature, is not going to be assured of doing anything at lower loads. It hasn't reached temperature. So, for example, a good example, startup. As you're starting out, those oxidation catalysts are doing nothing because they're not up to minimum operating temperature. So you have a situation where a lot of emissions are created because of incomplete combustion because the load is not high enough to assure the hottest temperatures. You create a lot of CO, a lot of VOCs, a lot of formaldehyde, and they don't get reduced at all in the oxidation catalyst, which is ineffective until maybe 40, 50, 60 percent load when the catalyst is warm enough.

So even if you did testing at 100 percent load,

you're not capturing anything about what happens outside of that load. And to simply make the assumption that, okay, I got some times per hour during testing and I'll track the hours, is very misleading and in fact, grossly underestimates the emissions. That's what I'm saying.

Q. And you had mentioned formaldehyde specifically. We don't have any information on projected formaldehyde emissions under startup and shutdown?

A. No, we --- we don't even have for all VOCs. We just have NOx and CO. And of course we know that other pollutants will be created. I mean they are there in the hourly table, quite frankly. It's not --- it's not --- there's no law of nature or combustion that says on hourly emissions you create a longer list of pollutants. Either fuel, but for some reason when you're in startup or shutdown, those other pollutants don't get generated. And the lines are just blank under startup shutdown.

Q. And again ---.

A. There is no law of combustion or chemistry or combustion chemistry that says benzene or, you know, will be created when you're at other loads, but not during startup shutdown. So, or formaldehyde will be not created during startup shutdown. In fact, that is patently false and that's absolutely wrong. And there's

plenty of evidence. You know, if you're --- if you're an air pollution specialist, you know that that's wrong. And so that is a problem.

Q. And beyond the pollutants not listed, even for pollutants that are listed like nitrous --- nitrous oxides and carbon monoxide, we can't tell if they, startups and shutdowns exceed what was assumed?

A. We cannot. And --- and carbon monoxide can be a good surrogate sometimes for VOCs and formaldehyde, but that will give us some useful information. But some pollutants --- there's a third class, particulate matter, because that has come up in testimony. Particulate matter doesn't behave either as NOX or as carbon monoxide. So they're flying completely blind, and the metals and things that are attached to particulate matter, you have no idea. And diesel particulate matter is particularly complicated, and you have no idea what is happening during startup shutdown where diesel will be burned.

Q. Thank you. Besides the different loads, are there other factors that can influence how much pollution is coming from the land? Environmental factors, for instance?

A. Yes. There's, fuel composition is a large

part. Even when we say something is natural gas pipeline, natural gas, it still has a range of composition. The methane content, the ethane, propane, butane, butylenes, it can vary. Diesel, same thing. Even if you take a spec number two diesel or number six diesel, it has a range of compositional differences, viscosity on top of things that will change that production of pollutants. On top of it, you need air, of course, to be the combustion oxidizer that we just get air because it's oxygen from that. The ambient conditions, the temperature, relative humidity of the air will play a role.

Again, just to reiterate, a cold day, the air is not --- is coming in colder. The combustion is a Little less efficient. You have more incomplete combustion, more production of things like CO and the VOCs and formaldehyde. So both ambient conditions as well as the fuel composition are at least important.

A third factor which is very important is age of the equipment. Over time, things deteriorate. Combustion systems need tuning. I mean, we know that from experience. You can't take your car for a check or a smog check one time and say we're done. It requires periodic checking because things go out of tune. So

that's because of deterioration. High temperatures, the blades in the turbine, the combustion can itself, there is wear and it becomes ragged and more, less efficient. And therefore all of these will affect emissions that are generated.

And then the catalysts also wear out. Whether it's the oxidation catalyst or the SCR, which requires ammonia by the way, in addition to its magic. The catalysts themselves erode, they deteriorate, they don't have the same efficiency over time.

Collectively, all these effect what's coming out of the smokestacks. And you have to look at all of that before you can simply say hey, a shade below 100 tons per NOx or below ten tons formaldehyde and call it a day just by tracking hours.

Q. And we're not able to determine, because there is no direct emissions monitoring, if any of those things have taken place?

A. Well, in a --- in a paradoxical way, if you had direct emission monitoring, I wouldn't care about what's happening in the turbine or the catalyst because I would know what is coming out, right? The whole point of direct emission monitoring is to then say, you know what? That's what we really care about. That's what's coming

out to the atmosphere, to the ambient at this stack.

A. We leave it to the operator what fuel, what ambient conditions, what catalyst conditions, what combustion conditions, how often they tune it or don't tune it. We leave it to them because we have the direct continuous measurement of what's coming out of the stack. And then we can just track that.

So by having a direct monitoring system --- and by the way, these continuous emission monitors are ubiquitous. It's not rare, they're widely used. They've been used for 30 years plus in power plants, including gas turbine power plants, including today in many projects that are issued out there, they will tell you if they're operating correctly, that just --- if the instrument is operating correctly, what you're going to measure. It actually solves tracking and the burden on the operator because you're not tracking a lot of things that are more minute detail because you have that top line number. So it would be very useful to have that top line number and that does not exist in this program.

Q. Now, based on this redacted information, you had done some calculations on the likelihood of formaldehyde emissions yourself.

Is that correct?

A. Yes, because I had carbon monoxide during startup on annual basis and as I mentioned, carbon monoxide and formaldehyde, these are products of incomplete combustion. They generally track, meaning one can be a surrogate for the other. Carbon monoxide can be a surrogate for formaldehyde or even VOCs in general. So I use that to make some estimates. That is correct.

Q. And --- so your calculations that we'll discuss, those did not address the concerns about not knowing the number of startups in shutdowns.

A. Correct. I relied on numbers that were available in the redacted version and used a reasonable assumption of surrogacy for carbon monoxide versus formaldehyde and said let me see how that looks. Whatever they said, however many startups and shutdowns were assumed in the redacted version, which had no way of knowing. I said it has to be the same whether it's affecting carbon monoxide or formaldehyde. In other words, you cannot have that unknown number differentially affect one pollutant and not the other. So that black box, that redacted black box would affect both pollutants. And since at least carbon monoxide had been mentioned both for diesel and for natural gas, I made use of that information to develop a reasonable estimate of

formaldehyde.

Q. And do you have any justification for using that surrogacy that you relied on to give us faith that that was acceptable?

A. Well, justification based on my training and experience. I'm a combustion engineer I mentioned from Caltech. I understand how combustion generated pollutants work, any type of fuel. But beyond that, it is widely accepted from a regulatory standpoint by EPA and others that yes, carbon monoxide can be a reasonable surrogate for VOCs, for formaldehyde. I should stress formaldehyde is a VOC, in other words, volatile organic compounds. VOCs are a class of compounds with carbon, hydrogen and oxygen. And they include things like benzene, they include things like toluene and xylenes, but they also include formaldehyde. Formaldehyde is the lowest, as all of you know. You know aldehyde, if you remember your organic chemistry, it's HCHO. Anything that has CHO is an aldehyde. So it is a direct, you know, producer. It's the first and direct produce compound for incomplete natural gas combustion. It is also formed in diesel.

Q. If you recall providing as a proposed Exhibit 2001 memorandum in EPA about the CO of formaldehyde.

A. Yes, as an example of that. I mean, this is not --- if you're a practitioner in the field, it's pretty well known. But yes, that is an example. And there are others. I did provide that.

ATTORNEY BECHER: May I approach?

CHAIR: Sure.

BY ATTORNEY BECHER:

Q. Now, do you have that memo with you in front of you?

A. Yeah. Which exhibit was it? I'm sorry again? Was that 4 or 5?

Q. This is August 20th, August 21st, 2001. I think this was actually initially labeled Exhibit 4 when I sent them to you, but now it's going to actually be 2.

(Whereupon, Appellant Exhibit 2, 2001 Memorandum, was marked for identification.)

THE WITNESS: I do see that it is ---. I do see that memorandum. Yes.

BY ATTORNEY BECHER:

Q. And just to be clear, we're looking at the same thing. That is a memorandum dated August 21st, 2001.

A. Yes, it's a --- it's an old memo. This is --- we're not talking about newly discovered laws of nature or engineering or facts. So this is over almost 25 years old. That's correct.

Q. And that's on USCPA letterhead?

A. Yes, it is.

Q. And, if you would turn to, I believe, the third paragraph.

A. Yes.

Q. Does this contain a statement that supports your use of carbon monoxide?

CHAIR: Stop for a second, we really need to enter this first. Is there any objection to entering this, Mr. Driver?

ATTORNEY DRIVER: No, Mr. Chairman. Well, we'll admit it and --- as authentic, but obviously we'll reserve the right to talk about the materiality or relevance. No objection that it is what it says it is.

CHAIR: So enter it as Exhibit 2. Go ahead. I'm sorry.

(Whereupon, Appellant Exhibit 2, 2001 Memorandum, was admitted.)

ATTORNEY BECHER: No, thank you for clearing that up.

BY ATTORNEY BECHER:

Q. And you'll see in that third paragraph, there's a statement. Carbon monoxide is a good surrogate for formaldehyde and other HAPs.

A. Yeah. Just so I'm sure in my version, that paragraph is the top paragraph on the second page.

Q. Correct. Oh, I guess it would be the fourth paragraph. I'm sorry.

A. Yes. Just to be really sure about that, because that's the operative paragraph. It says formaldehyde is the most significant HAP emitted from combustion turbines. And that's the point I made earlier, especially for natural gas. And that carbon monoxide is a good surrogate for formaldehyde and other HAPs, meaning the VOCs. And that's exactly what I was mentioning earlier.

Q. Okay.

If we go back to the preceding paragraph. That talks about pollution controls, the oxidation catalyst.

A. Exactly. The oxidation catalyst acts on CO and VOCs and formaldehyde. Correct.

Q. So is it your testimony that this is an exhibit

that supports the methodology that you used in your calculations using CO as a circuit?

A. Yes, it completely supports that. And what I've done by way of calculations is conservative. Meaning emissions have estimated to be even higher for reasons I can explain. But even as a first cut relying on CO, there is absolutely no question that since we know the CO numbers, at least even in the unredacted --- even in the redacted version, that can be used formaldehyde emissions because they're not separately noted in the redacted version. In fact, the redacted version actually confirms that there's zero. That's why there are dashed lines for startup shutdown formaldehyde. And that is incorrect. And to fill that gap, it's entirely appropriate for that.

Q. And I would now like to have you turn to those calculations.

A. Okay. There's a table there was an exhibit. If everybody has that, I can walk them through that.

ATTORNEY BECHER: May I approach again?

CHAIR: Absolutely, please. Scott, do you have this table?

ATTORNEY DRIVER: My apologies, I was still on mute. Yes, I do.

BY ATTORNEY BECHER:

Q. And Dr. Sahu, can you explain what this table represents?

A. So this table represents my estimate of the formaldehyde emissions and all HAP emissions. So there's an all HAP and then there's a formaldehyde. I was trying to estimate what those would be under the totality of normal and startup shutdown conditions for this proposed plant.

Q. And again, this is ---.

A. That was the purpose.

Q. This is based on information in the redacted permit using the assumptions that were used by ---.

A. Yes, they're redacted version information, but self-consistent, meaning whatever those black box assumptions were, even without knowing them, they would still apply to this type of analysis. So I did not use any unredacted records because when I did this, that's what I had is the redacted version.

CHAIR: All right.

So, this to enter as Exhibit ---.

ATTORNEY BECHER: Three or 4?

CHAIR: Three.

(Whereupon, Appellant Exhibit 3, HAP PTE E Estimate, was marked for identification.)

CHAIR: Any objection?

ATTORNEY DRIVER: No objections.

CHAIR: All right.

(Whereupon, Appellant Exhibit 3, HAP PTE E Estimate, was admitted.)

BY ATTORNEY BECHER:

Q. All right.

Can you walk us through your calculations, Dr. Sahu?

A. Yes. It'll be pretty painless. So there are three panels, if you will, that are separated by this kind of double line. The first panel beyond the titles of the columns is for natural gas. If you look at the fuel is natural gas for that first panel. So I'll describe what I did for natural gas. It's an identical process for diesel in the second panel and then the summation of that really is at the bottom for both fuels. So let me just tell you what I did for the natural gas.

So as I mentioned, for carbon monoxide we do

have two pieces of overall information regardless of how they were calculated. Both annual normal emissions or operations. The application says it's 19.32 tons per year. You can check that against page 59 where there is number comes from. And the same page also talks about the startup shutdown of natural --- using natural gas for carbon monoxide, which is 37 tons.

Right away here you should be struck that even by the applicant's own analysis you have almost double the amount of CO coming from startup shutdown. As for normal operation, that tells you how inefficient that combustion is in that initial part. Why load is important, why testing at 100 percent under normal operation will not tell you anything about that very inefficient and high emitting condition. It should be a red flag right there. From your verification and monitoring, you know, that your stack test, unless it can test at all loads, is not going to tell you anything about this higher emitting portion in non-steady startup channel.

Having made that point, I do have those two numbers however they're estimated with however many events and durations by the applicant.

Q. Let me --- let me jump in here real quick. You

have a reference on this table to page 59 for natural gas. I'll have you turn to page 58 and see if that's ---.

A. Yeah, these might be PDF pages. So let me go there. Let me just make sure because when I was doing this there was one off the PDF and --- confirm that. For that then I will make my apology. No, actually it is page 58. You're right. So it is PDF 59 and number page 58 is what I'm talking about.

Q. Okay.

So where we see page 58 here --- or 59 here should be 58.

A. And then one off for the other one.

Q. And so for diesel we see page 60, it should be 59.

A. That's correct. I should have made it clear that these are PDF page numbers in the PDF document I got, but number pages off.

ATTORNEY DRIVER: And this is Scott. I hate to interject here, but if the Board could inquire of Mr. Sahu whether or not he is referring to any digital notes during his testimony, I think that might be appropriate.

CHAIR: Okay.

THE WITNESS: I can respond. I don't have any notes.

ATTORNEY DRIVER: Thank you very much.

THE WITNESS: Yeah, I don't have any notes. I'm just --- I have a couple of --- what I have on the computer are the exhibits in electronic or PDF form. Those documents are open, but I don't have anything else.

ATTORNEY DRIVER: Thank you very much.

THE WITNESS: Sure. May I turn to the calculations?

BY ATTORNEY BECHER:

Q. Yes. And so you had said that the references to page 58 for operations and shutdowns for CO, those are representative of the information from those pages. From there ---

A. Yeah.

Q. --- to calculations?

A. Yeah, the 19.32 and the 37.05 are directly taken from what is number page 58.

Q. As well as the ---.

A. I'm coming to the next two, which is the formaldehyde and the total organic HAPs. And that's important. The CO on this scale with organic HAPs. The

formaldehyde is taken directly from that page and the organic HAPs are 9.33 tons because I did not include any metals, for example. They did not scale the CO.

Q. So again those are taken from the figures in ---.

A. Page 58 of the application. In other words, I assume that they are accurate even though I don't understand how they were developed. But this application was submitted with all kinds of jurats about accuracy and reliability and clearly the DEPS relied on them. So I used those numbers.

Q. And then you performed a simple mathematical operation with the scaling?

A. Yes, and I simply scaled formaldehyde. If I know the normal operations are 3.86, what would the startup shutdown emissions be? I don't have that directly because it's listed as blank and I know that that's inaccurate. So what should that be? Your first approximation? I use the CO values because I have those, the 19.32 and the 37.05 and CO scales and formaldehyde scales with CO. So that's how I come up with 7.4 tons, which is not surprisingly almost double. Just like CO was double. The 7.4 tons is almost double of the 3.86 tons.

And similarly total organic HAPs the simple algebra which is you take the 9.33 tons and multiply it by 37.05 divided by 19.32, CO scaling that gave me about 17.9 tons. So I put my estimate scaling in italics just to show you that those are my scaling calculations. The nonitalicized numbers are taken directly from the application.

I do the same exact thing for diesel. Different page. This should be page 59 instead of 60 because of the PDF numbering. The first four numbers come directly from numbers in that page from the application. I do a similar scaling. Here you can see with diesel things are a lot worse even by the application alone. CO for normal operation for diesel is a little less than 7 tons. CO for startup is 46 tons just from the application. That tells you how poor the combustion will be. The liquid fuel. Liquid fuels are harder to complete combustion and that's the consequence of that. You have a lot more unburned combustion going on. And this is again doing mental math is close to six and a half times the emissions.

Here again, if you did test for diesel during one time near stack test. It will tell you nothing about this dramatic and much higher emissions during non-steady

state startup shutdown conditions. But the process I did was the same. I scale the respective diesel numbers to come up with the italics numbers which are the 10.8 for formaldehyde, you have startup shutdown for diesel and 15.5 for the organic HAPs, again excluding the metal HAPs.

And then the bottom panel is simply the summation. I have the normal operation first for --- I mean first for formaldehyde, then for the organic HAPs. So I know the normal operation for both is simply what is reported in the respective pages. The 3.86 and the 1.58 that's 5.44. The startup shutdown, these are my estimates in italics, the 7.4 and the 10.8 and they combined therefore normal plus startup shutdown is 23.6 tons.

Recall that for any given hazardous air pollutant, 10 tons is the threshold above which things become major source of HAPs. And by including the reasonable estimate even from the redacted version for what those missing startup shutdown emissions are formaldehyde I am well over 10 tons. I'm at 23.6 tons.

Q. And I have a question for you on the formaldehyde under diesel.

A. Yes.

Q. Even if we take your scaling for formaldehyde going back up to the first box.

A. Yes.

Q. Startup and shut down in 7.4?

A. Yes.

Q. And we add that to what we would expect to produce under normal operations.

A. Which is 3.86 according to the application. Correct.

Q. We would still be over the 10.

Correct?

A. Yes. Just by doing mental math, you'd be over 11 and change just from gas alone. And if you did the same thing for diesel alone, you'd be also more than 10 because the normal is 1.58, the startup shutdown is 10.8. On either fuel alone you would be over. And of course combined both fuels you're over. And just to round out the calculations, I did the same thing for all organic HAPs and that is 45 tons. I did that because there is a separate threshold for major source for all HAPs, which is 25 tons of HAPs aggregating. And my calculation actually is underestimating it because for all of the all organic HAPs is 45. You bring in the metal HAPs on top, it'll be even more than that. But I'm well above 25

tons. So that's what this calculation confirms, that this is not a major --- this is not a minor source or a synthetic minor source of HAP emissions.

Q. And again, if we go back up, just looking at for example, the natural gas where you had calculated all organic HAPs during startup and shutdown, 17.9 and then add that to the normal operations figure that was given by the Permittee were above that major source threshold.

A. Yes, this is --- now you're adding others not shown 19.17.9 to the 9.33. You're over 27 tons, which is more than 25 tons for the major source just on gas alone. And then --- and for hopefully in discussion that will follow, I'll show why even this is dramatically going to underestimate even what the actual formaldehyde emissions are likely to be. In other words, even though this is major with my scaling, I will show that it is likely to dramatically underestimate even what the actual emissions or potential emissions will be either one of them under gas alone. And we can talk about that.

Q. And just to be clear, that discussion would depend on your discussing confidential --- what has been designated as confidential information?

A. No, that information will depend on some publicly available testing done by EPA.

Q. Fair enough. Just wanted to make sure we were on the same page of where we're going. Okay.

So you just mentioned some publicly available information. Did you review publicly information available information on --- are you aware of anyone else that has looked at increased formaldehyde under unreduced waters?

A. Yes, EPA has looked at it. EPA rulemaking going back almost 20 --- 10 years ago for gas turbines, for lean burn gas turbines, exactly the same technology they have looked at. So they have looked at it quite extensively at the time. As a practitioner who deals with this all the time I'm aware of that work even though it's 20 years. Luckily for me, how incomplete combustion works in combustion chemistry has not changed in 20 years. And so that is very reliable information.

Q. And you provided EPA review you're referring to as a proposed exhibit.

A. I have provided that exhibit. It's publicly available. It's nice, not a secret. These are just like the other Sims document is publicly available. This too is publicly available. And that's what I provide.

ATTORNEY BECHER: May I approach?

CHAIR: Sure. Scott, do you have this one

as well?

ATTORNEY DRIVER: I do, Mr. Chairman.

(Whereupon, Appellant Exhibit 4, 2003 Memorandum, was marked for identification.)

BY ATTORNEY BECHER:

Q. And just to make sure we're looking at the same thing, this is a June 23rd, 2003 memorandum.

A. Yes, it is a memorandum from an EPA contractor working on this rulemaking to the same Mr. Sims from EPA dated June 23, 2003. Right.

Q. Okay.

And is there any significance to this stamp on top OAR-2002-60?

A. That's a stamp that says it came from that docket. I mean, OAR-2002-0060 was a rulemaking docket. It was a document from that docket.

Q. So this would be an EPA record?

A. It's an EPA record.

CHAIR: Are we entering it?

ATTORNEY BECHER: Yeah.

CHAIR: Any objection? Mr. Driver, any

objection?

ATTORNEY DRIVER: None, Mr. Chairman.

CHAIR: We'll enter it as 4.

(Whereupon, Appellant Exhibit 4, 2003 Memorandum, was admitted.)

BY ATTORNEY BECHER:

Q. Can you explain the significance of this document?

A. Yes. There are two important takeaways from this document and they're both important. So the first --- or either one, the first issue is that this is a summary of actual testing, not calculations, actual testing done on a number of lean premix combustion turbines. Exactly what we're talking about here, the same technology, across many different manufacturers, many different test sites. Available at the time focused on formaldehyde emissions.

And two issues were looked at in the memo we'll discuss. One is how do you measure that? In other words, the measurement methods. In other words, how, if you want to accurately measure formaldehyde, what type of measurement or test methods do you use? They're listed

on that first page and we'll gloss over them. There are EPA methods at that time. There is something called the California Air Resources Board method. These tests were done using different methods to see the inter method variability. And that's one aspect of the method. Not what I'm going to stress here. Not because it's not important, but I'm not going to stress that here other than letting the Board know that any testing you might do later on for formaldehyde has to be carefully done because there is inter test method variability. And that is something very important. You just don't do a test. Tests are complicated and they're not simple and you have to be mindful of that.

But regardless of which test method you use, the second point is what I want to stress, which is for many of these situations, the testing was done at different loads. The point I've been making that just testing at 100 percent load is not the same as testing at other loads. So formaldehyde was measured by multiple test methods at different loads. And you will see when I show you examples how dramatically, I mean, I can't use any other word how dramatically the load plays a role in the emissions for reasons that I've explained, which is the combustion conditions become more ragged, more

inefficient as you get to lower loads and sometimes not even greater lower loads and you get therefore higher emissions. That's the part I want to show the Board.

Q. Let's turn for example to page four of this document, which was done on, I believe Solar Mars, Solar NOx. It has loads 100 percent, 75 percent, 50 percent and 35 percent. Can you describe those?

A. So two or three things just to be --- orient everybody who has this at the top, because when I scroll down I don't see it. But if you have hard copies, the last three columns are different test methods. In other words, they are just side by side comparisons. And these are all in the same units. And formaldehyde is typically reported as parts per billion corrected to 15 percent oxygen. And so those are all the same units and correction to oxygen.

And with that said yes, the last grouping of tests which are happen to be the Solar Mars, they were done on this page you can see the first part of that is at 100 percent. That's the load. And that is the --- you can again look at the top header. It says turbine rating and then load, and there's a database ID.

So there's 100 percent, 75 percent, 50 percent and 35 percent loads. Startup shutdown, by the way, will

definitely be within 35, and arguably even at 50 percent load, based on what most people do, you're still in startup between that 35 and 50 percent. So keep that in mind. And then they had different runs. So there's a run to run variability. The 100 percent was at three different runs and then there was an average. And then there are a couple of runs for each of the others. And there are averages there as well. Other than making the point that you can even see the run to run variability even at same load, you can --- you don't get steady state quote, unquote, because combustion is not steady state process. It's inherently unsteady state even at the same load.

But besides that point, what I want to show you is the dramatic increase as you go in the average numbers as you go lower and lower. So we can pick anyone. We can --- let's pick the last column since it's easier to track. The average for the three runs was 46.9. If you can see that number, parts per billion at 15 percent oxygen. And that's in that last estimate. Just by dropping to 75 percent load, that 46.9 on average is now 194 parts per billion. Not quite --- you know, not quite five times, but over four times higher.

And then when you go to 50 percent load, that

46.9 is 2,415 parts per billion. Again, doing some very simple mental math, that is 25 times higher. Just compare 50 to 2,500 you get five --- you know, you can do the math.

So and then the last one at 35 percent get off the charts. The average is 83,000 and change parts per billion. Compare that to the 46.9 at 100 percent load. When I show this to people, there's not an appreciation how rapidly combustion deteriorates at lower loads and how therefore 100 percent load is absolutely not representative of all loads. And this is actual data. And this is one example. This is the Solar Mars. And so just because it had four different loads showing you that progressively worsening and dramatically worsening formaldehyde number. And that's what I want to say from this panel.

Q. Let's --- let's look back at another turbine manufacturer. If you go to page three, we don't have the same variability of loads, but would you say that looking at the Fort Saint Vrain, the GE turbine there.

A. Yeah, it's a little bigger size turbine, 130 megawatts. And they did that at --- it's a reverse that it's 100 percent load and 25 percent load. So if you look at the 100 percent average, and again, the last

column was 4.6. The 25 percent load here is 12.6. So not quite the worsening we saw in that solar, but still three times higher at 25 percent load. We actually do see that. The load implications of VOC, CO and formaldehyde is not really a question if you understand combustion in these internal combustion engines.

Q. Yep. And just to give one more example, turn to page 11.

A. Let me get there. Page 11. Okay.

Q. We see the Sommerset, Ohio turbine operates testing under 100 percent and then down to 73 percent load.

A. Yes.

Q. And do we see an increase there?

A. Yes. And again, this is not very dramatic reduction in load. That's a different Solar Mars turbine, 14,000 horsepower. Not --- not a small turbine. And yes, you see 100 percent of that turbine. The average was 60.9. Again, focusing on the last column just for ease. And that is 231 parts per billion. Again, average. And so that's, you know, little less than four times. Again, this is gas fired. And if you recall my calculations, the gas fired difference between startup and the steady state was about a doubling 19

times, 237 times. And these examples show that doubling is not --- doesn't even capture what we see here. It is 3 times, 4 times, 25 times, you know, hundreds of times. It could be. So even using a doubling, you're actually source and above. And when you look at actual load variable data, the doubling is conservative. That's what I meant by I was going to show you that my calculations likely dramatically understate the formaldehyde emissions that you get collectively mainly from start up and down.

Q. And there is one example here that may first seem counter to your theory. If you turn to page 10.

A. Yes. There are tens of them here. One of them I can show you. Yes. I don't hide any of this. You can look at it. I mean, I didn't count them, but there's probably 20 or 30 different tests and only one was anomalous. And you can point that out to the Board.

Q. And even though this is anomalous, if you look at page 10, the Richmond, ME. Is that what you were talking about?

A. Yes. Yes. There was one empty, and that's the Taurus turbine. And that one --- that one could be. It appears anomalous because there are two loads, but each load is listed as a range. So there's an 82 to 55 percent load because this --- the equipment was not

running even during these runs. And that had 565. And in a lower load. This is what I mean by paradoxically that 66 to 71, the average they reported was 184, which is low. That is counterintuitive. So this is the only instance. Let me just finish that. But we don't have clarity on the actual load, so that makes it a little hard to do.

Q. And in fact, the range is given the top one, although it has a higher max --- or higher high load. It actually has a lower low load.

Is that correct?

A. Yeah. In other words, you could have the lower panel be between let's say 71 or 66 or 71. The lower one could be at 55 and that would not be an anomaly. But because it's in this range, you really can't tell. But other than that, every single example, and there are many here in this memorandum that all point consistently to what should fit in and does fit in with understanding of how combustion works, which is dramatically higher. Startup, shutdown, half emissions.

Q. And do you believe this supports your calculations?

A. Yes, it does. Because my calculations are understated. If I had multiplied instead of scaling the

factor of two roughly from the redacted version, but used a factor of three, a factor of four, factor of 20, you can only imagine how high those numbers would have been and how much dramatically they would exceed the 10 or 25 ton thresholds, perhaps.

Q. And this is testing that was done in 2003. Do you know of anywhere where EPA has stated the testing of formaldehyde more recently?

A. Yeah, EPA is going through a Rulemaking start and stop about updating their rules for formaldehyde for gas turbines. And there is some preamble language, you know, just without as much detail but just noting that very fact again very recently. Just to stress just because this data is old doesn't mean combustion chemistry has is not valid. I don't want to get --- mislead anybody. Combustion chemistry and incomplete combustion continues since the day five was made by prehistoric human beings. So that's the same. But yes there is more recent data for people that want to see that has not changed.

Q. Thank you. And so you can bring it up. I'm going to bring up the Federal Register notice actually dealing with the petition to remove stationary combustion sources major sources of hazardous air pollution.

A. Yeah, it's a relatively recent Federal Register notice from once you show folks it's from April of 2024. It's not too long ago. And I'm just trying to get to that on my end.

Q. And I believe the relevant section that we had discussed is on page 2684.

A. 26840?

Q. 26844.

A. 844. I'm sorry. Yeah, thank you for pointing that out. Yes, I am there and I see now. Correct.

Q. And there's a statement in the second column about two thirds down that paragraph. A similar analysis formaldehyde emissions for Unit 7 and 8 and Northern Natural gases water with compressor station showed the amount measured formaldehyde emissions were 31 times --- 18 times units higher than estimated emissions.

A. Yes, the entire discussion for people that want to meet if there's some examples from a landfill gas turbine and I'm excluding that because we're not burning landfill gas. But quite honestly bears because any type of gas, any type of fuel has poor combustion at lower loads. But just sticking to even the natural gas. Yes. Two different units were tested here and VP is talking about that. This is from the waterloo station in Iowa.

They use gas fired turbine for that compressor station and yes dramatically higher 31 times and 18 times depending on the unit that the estimated emissions, so same thing.

Q. And this is illustrating the magnitude of difference between projected emissions like we have for this permit.

A. Yes, exactly. This is --- but accounting for the full range of emissions not just during full load. That's the whole point is the load variability and how that can dramatically completely skew in a bad way these projections done only for 100 percent load.

CHAIR: Okay.

This is Exhibit 5.

ATTORNEY BECHER: Exhibit 5.

(Whereupon, Appellant Exhibit 5, Federal Register 2024, was marked for identification.)

CHAIR: All right.

BY ATTORNEY BECHER:

Q. We've talked a lot about two pollutants based on the redacted data. The nitrous oxides as well as the

formaldehydes. Given your review and your calculations, just based on the redacted information available to the public, do you think it's likely that we will exceed the minor source thresholds for nitrogen oxides?

A. Yes, I've stressed the whole thing in the last 10, 15 minutes or more for formaldehyde and for all HAPs, but for nitrogen oxide for sure. Mainly looking at the non-existent in my view margin. If you look at the redacted version depending --- and the permit, if you look at the permit were looking at that had the combined fuel, you're barely by a sliver below the 100 ton threshold. And I know mathematically it looks that way, but with combustion variability NOx generation, you literally as an engineer cannot say what the statistical difference between a 99 point change and 100 tons is. There is no statistical difference.

So this is a permit by algebra and it means nothing because the variability can overwhelm you. If you're an air pollution practitioner, you know that the uncertainty in these emission estimates can be 20, 30, 40, 50, 100 percent, not slivers of 1 percent. And so by taking a strategic position that I'm going to stay below major source threshold. And for reasons that have come up in testimony which I wholeheartedly agree with,

because it avoids dealing with major source modeling and VAT monitoring and all kinds of things, you are pretending here that you can actually demonstrate that you will below major source threshold even at the best of times, even if you have continuous monitoring and here you don't even have that, you're truly flying blind. And so yes, for NOx for sure and for HAPs and formaldehyde, which is one of the HAPs you're going to be over the threshold, keeping all other assumptions the same. Which is in other words, as the facility has been presented to operate whatever is behind the black boxes, you're over on either count.

Q. Thank you. Now, I understand we're going to review some of the unredacted data in a closed section. I'd like to just briefly address another topic before we go into the closed section. If you go to the certified record at page 226.

A. Let me just get there in a different document. 226. Okay.

Q. I believe you will see that the DEP did take account of certain fugitive emissions.

A. Yeah, there's a list of them there. This is just to be sure. This is page 14 of 30 of the permit itself.

Q. Fourteen (14) of 30 of --- yes, I believe this is engineer's evaluation and it's page 226 of the certified record.

A. Yes. If you're looking at a table in the middle of that, it has really the five sources that are listed. We focused almost exclusively on the turbines for either fuel and then the tanks, the unloading of the diesel, the paved haulers and the future leaks. That's correct.

Q. Based on your experience, is there any obvious sources of pollution missing from these emission sources?

A. Well, yeah, there are other things that are certainly pollutants. I mean ammonia is a good example. Ammonia is a reagent that's going to be used in this SCR for NOx reduction. This doesn't talk to bringing in ammonia, unloading ammonia, storing ammonia, handling ammonia emissions associated with all of that. So that's just off the top of my head.

Data centers require enormous amounts of cooling. Just by the nature because the chips that are used there are extremely large heat generators. In fact, we had a cooling failure, if you recall, the entire Chicago Board of Trade shut down two days ago in the middle of winter in Chicago in the middle of a polar

vortex nonetheless, two days ago. But all futures and options trading off worldwide for 12 hours due to a cooling failure, a chiller failure. And so there are --- they will likely be cooling here as you can just do it with air cooling in summertime in West Virginia can get humid and reject the heat. And so there are chemicals associated with that with the cooling side that I don't see any mention of. So yes, as matter of completeness, these are not likely to be the only sources of even operating emissions. This facility is built and operated.

Q. Thank you, Dr. Sahu.

ATTORNEY BECHER: And if you could now I'd like to ask pursuant to the protective order to go into a closed session to look at ---.

CHAIR: Well, before we do that, do we want to give Scott an opportunity to Redirect without going into the redacted data or would you prefer ---?

ATTORNEY BECHER: Do either way.

CHAIR: Do you have another piece --- when we come out of redacted, do you have another piece you're going to do?

ATTORNEY BECHER: No, that is it. Except for the portion on the confidential data.

CHAIR: Strong feelings. How do you like to handle it?

ATTORNEY YAUSSY: I guess I just as soon do it all at once, but I don't --- I'm prepared --- if you want us to do the non-redacted first, we can do that.

CHAIR: Scott?

ATTORNEY DRIVER: I'm fine with however the Board decides they want to handle it.

CHAIR: Okay.

Well why don't we go ahead and Cross then with what's been presented so far and then we'll have to Cross again for the redacted portion so ---.

ATTORNEY BECHER: Can I make a request to take a very short break? We've been going for a little over an hour and a half. Drinking too much Diet Coke.

CHAIR: Let's take a break and let you guys strategize for a minute that we do that. So let's take 10.

(WHEREUPON, A SHORT BREAK WAS TAKEN DURING THE PROCEEDING.)

CHAIR: Okay.

Just as a logistical thing before we

start, a lot of discussion during the break has been where we're going with testimony today. And it's pretty clear we're not going to be able to finish this up today. So our intent is that we will do the Cross now for what's been presented to us so far. We will then go into the confidential session, in which case the room will have to be cleared and that will be the end of what we do today. And then we'll come back tomorrow morning at 8:30 and finish with the Appellee and the Intervenors for the positions. Okay, so that's where we're going. All right.

ATTORNEY DRIVER: I'm sorry. I'm sorry, Mr. Chairman. I had to step away for a moment. Did you say that when we're done with Dr. Sahu, we're going to be done for the day?

CHAIR: That is our intention. Yes, sir.

ATTORNEY DRIVER: Thank you.

CHAIR: So you can release your witness for the day.

ATTORNEY DRIVER: Thanks.

MS. DERAIMO: And Scott, did you receive by email with the phone number?

ATTORNEY DRIVER: I did, Kenna. Thank you.

MS. DERAIMO: Okay. All right.

CHAIR: So at this point then, we're ready for the Cross Examination with our witness. Mr. Driver, you're up.

ATTORNEY DRIVER: Thank you. Mr. Chairman. One moment. My apologies. I was trying to find my notes here.

CROSS EXAMINATION

BY ATTORNEY DRIVER:

Q. Okay.

Dr. Sahu, can you hear me okay, my voice isn't super loud?

A. I can --- I can hear you, Mr. Driver. Yes.

Q. Thank you. I was going to say I have a few questions, but they might evolve into some more. If you had confidence in the max hourly emissions of a pollutant from a source, and you've limited the number of hours that source could operate, can you determine the max annual emissions at that point?

A. Yes, but predicated on both those ifs, that's just arithmetic at that point.

Q. And if you had confidence in those max hourly

emissions and they operated at or under the hours of operation limit, would they violate the annual emissions limit?

A. Same answer. But that if becomes even more important because that is not true for every pollutant. That's the point I've been making. The max hourly is not --- it is a function of the load and not just at max operating load.

Q. Now in your experience, when a vendor gives a guaranteed emission rate of a pollutant, what does that mean?

A. So I have quite a bit of experience in that, including for the major turbine manufacturers. What that means is that they --- a guarantee. When I've actually seen them, they say we will stand behind a number. And at this point we can talk about the form of the number, but typically it's a concentration so many parts per million of some pollutant, but subject to some key caveats. The three that are important, that are common to all the vendor guarantees I have experienced or seen, number one, they're for limited time. They might be for a year. They might be just for the acceptance test itself. And it might be just I've never seen one for more than a year.

Number two, the vendor will specify the test conditions. Generally what are known as for turbines, ISO conditions. This is international standards organization. It has certain standards for testing under pressures and temperatures and so on. And usually the manufacturers will have test rigs for ISO testing. And that's where they would be doing their own testing. And they say as long as the test conditions are ISO, then we will do. And then sometimes they might give you guarantees for other conditions if they have that type of confidence.

And then the third is they want to know that the fuel specifications are pretty tight. As I mentioned, fuels are an important part of what emissions might result. And so they will tell you that, you know, we are going to give you this limited guarantee based on what you have to you, meaning the purchaser of the turbine of what fuel you're going to use and will echo that back to you and then give you that limited time guarantee, typically till the first acceptance test.

Q. If the vendor's guarantee, and we're talking about during the length of the guarantee, is at or below the level of a permit limit and the equipment's operated per those vendor spec, does that raise the level of

confidence that the units wouldn't vary the length of the guarantee?

A. No, it does not. Because I have never seen a vendor guarantee anything at different loads. I mentioned the load variability here. Vendors will guarantee some things at certain loads, but not the loads that are at issue when emissions are created. But your question may be, you know, if the vendor is saying, for X pollutant, I will meet Y percent or Y ppm for Z load. Yes, for that limited circumstance, I can say that they will test and they will meet it.

I should also mention one thing. Vendor guarantees. The contracts that I've seen usually have a provision or provisions that say if we fail, then we get the right to fix or tune and retest. So that is very common part of a guarantee, which is we will stand behind a number and we will use our testing company or a mutually agreed upon testing company and we will do a test. But for whatever reason, if the number turns out to be above, then we get the right to go back and make whole and do things. Whether it's maintenance, whether it is more, you know, tweaking depends on what might cause that. And so the guarantee is also limited by having that sort of chance to fix the problem. But those

are extremely limited guarantees, even under the best of circumstances is the point I'm trying to make, Mr. Driver.

Q. So if those limits are so narrowed down to what sounds like essentially the molecular level, why do they exist? I mean, it doesn't sound --- it basically sounds like, okay, if you can get through the eye of a needle with this circumstance, then the guarantee works. So what's the use of the vendor guarantee?

A. They're pretty useless is the short answer. They are pretty useless. When you look at the, you know, when you, this turbine, these turbines, however many they are, will operate for decades. They're going to operate for a long time. You don't put an investment like this to have it run for two years and shut it down. So either equipment will deteriorate. All kinds of things will happen. So they are pretty limited.

I think the correct answer, and I'm being very candid with you, is there is something magical about the word guarantee. When people hear that, it's like, oh, there's some kind of a absolute, you know, thing I can depend on. And that's our common sense English word. The guarantee kind of conveys a lot more vigor and solidity or assurance than is warranted. And this

happens all the time.

But these guarantees are --- and I can understand the vendor's perspective, the vendor can only operate in up to a limited time. I mean, they don't know how the equipment will be operated, how much maintenance will be done, whether everybody's going to follow the exact requirements of their manual. Those things don't happen. I mean, you take our own experience. Do we maintain our cars exactly like the way forward GM tells us to? No, we fail. We don't do that all the time. So for them to then give you the guarantee that has any more longevity is something that is unfair to them.

I'm not dinging the vendors. I'm saying emissions are complicated. They depend on many factors, and you get a very limited, very short duration qualified guarantee. And by the way, I've seen contracts with no liquidated damages and all kinds of contractual outs we don't even need to get into. So they have produced us. I mean they're not reliable in lieu of testing. If they were, then EPA and states wouldn't be requiring continuous emission monitoring from many types of sources. They would simply say what did the vendor tell us? Let's just go back. The reason we have continuous monitors everywhere is because these things are not

designed to give you that robust assurance.

Q. Now are you suggesting a CEMS, which is the Continuous Emissions Monitoring Systems, CEMS. I'm just going to call it CEMS going forward. Are you suggesting that for every pollutant?

A. I'm suggesting that for whichever ones the CEMS are available. You unfortunately don't have CEMS for every pollutant. The technology doesn't exist for example condensable PM 2.5, you just have ---. So where we have CEMS that are widely used, I'm suggesting you should use them.

This is a pretty sizable power plant in its aggregate and if this power plant was built a little differently, it would have SEMS. For NOx, for CO, there are CEMS for organic HAPs, there are CEMS for filterable particulate matter, there are CEMS for ammonia. There's all kinds of CEMS out there and they're --- meaning they're out there in use. So yes, subject to availability. I'm suggesting that gives you much better data than any kind of assumption base or vendor guarantee base.

Q. Are you aware of any legal requirement for that?

A. I can't --- I can't speak to legal

requirements. I can tell you based on as a practitioner, any permits for turbines, half CEMS, NOx and CO for sure. I wouldn't for example put SO2 here, except if a lot of diesel is used. I can put an SO2 CEMS, but natural gas is very little sulfur. So for all natural gas I wouldn't recommend an SO2 CEMS for example. Money is better spent putting, you know, HAPs and organic HAPs or VOCs for example. But yeah, permit --- when you say permits are out there, which are legally binding, many, many permits have CEMS required.

Q. And I'm not --- we've already established you're not a lawyer and I'm not going to dance into that. But you have said you're familiar with the permitting process in some of these instances. Are you aware of any permitting requirements for what you're suggesting. Anywhere?

A. I don't fully understand the question, so can you clarify? I just said as a practitioner who's familiar with permitting and permits, if the question is CEMS, yes, there are many permits with CEMS required for natural gas fired turbines.

Q. Okay.

I think I was unclear, but I don't think that line of questioning is going to be super productive, so I

won't belabor it. You believe there should be a CEMS for NOx.

Is that correct?

A. Yes, for sure. I mean as I said, there's no statistical difference between the major source threshold and what is presented as a PTE for sure. Not a CEMS. I don't know the configuration, at least in the --- we're still in the redacted world. So CEMS for NOx for sure.

Q. And why NOx? And some of these are necessarily going to overlap with questions that Mr. Becher's already asked and I apologize. But why NOx?

A. Because you look at the application itself and you look at the permit and I think I was on that page. The NOx emissions are expected to be 99.35 tons per year. The major source threshold is 100 tons per year. You have no margin, no engineering, no scientific margin, effectively no statistical margin. Between the 99.35 and under, they're one and the same statistically. It's what I call an arithmetic margin. If you measure even in your one time stack test, forgetting all the load variability and everything I talked about, or the fact that the SCR will deteriorate over time, you will have run to run variability that will overwhelm this non-existent margin. And so the only way to know the totality of NOx being

emitted is to monitor it, not rely on a test that barely captures anything.

I mean just think about it, Mr. Driver. You do a test typically three runs, three hours. In a given --- even if there's one turbine that runs for a year, that's 8,760 hours. So you're doing a three hour test even for one year that barely captures operating variability. And if it just doesn't do it. If the margin, if this --- same reason, if this thing had a lot more margin, then it would be a different story. But you have no margin for NOx. That's the reason.

Q. And I apologize if I'm mischaracterizing what you said earlier. Did you say that CEMS should be required for anything where it's reasonably feasible to use the CEMS? Or am I just mischaracterizing what you said completely?

A. You didn't mischaracterize it completely. But let me just say it again. I'm saying, here, if those only natural gas, I give an example, I would probably be not hung up about in sulfur dioxide CEMS, those are widely available. But here you have diesel. It's going to produce a fair amount of sulfur dioxide. Even with, you know, whatever diesel is available in the market.

VOCs, CEMS are available. We talked about

formaldehyde as a VOC. It can be a better surrogate or CO or VOC both as surrogates for a number of HAPs. Every individual HAP does not have a CEMS right now available in the market. So you need to do some surrogacy and test against periodic testing. So yes, there are multiple CEMS available. You have to make the argument. And from what I've looked at NOx, either CO or VOC, PM filterable, PM 2.5 or PM 10 filterable, those are available CEMS and you'd be surprised how much ammonia are you going to put out of this into the SCR and ammonia CEMS. Certainly look at those.

Q. So do you think there should be CEMS for each one of them?

A. Yes. Well, there should be CEMS for each turbine for these pollutants.

Q. And do you believe that it would be appropriate for DEP to require those CEMS for every synthetic minor here in West Virginia? Is that where you're going with it?

A. I've not looked at every synthetic minor. There may be synthetic minors that are well below the major source threshold with a lot more margin. An argument can be made that even the variability is still well below the threshold. But this particular synthetic

miner for CEMS has no --- for NOx has no margin.

And this particular plant has really not --- is not even a synthetic minor, in my view that I've shown for HAPs, for formaldehyde. But the answer is philosophical question. This may be troubling to you, Mr. Driver, but the reality is when you take a synthetic minor, you actually are making a representation to stay below certain limits. You actually increase your obligations to monitoring. If you are a major source, and we only have 100 ton as an example here, if you're 102 tons or 200 tons, you're a major source either way. You don't have to --- it is what it is in other words.

But because you have represented, or you, meaning the Applicant is represented, that they are going to stay below this. We're going to only put 59.99, you know, gallons of trash in a 60 gallon trash bag, but you're going to monitor that trash bag and how much you're filling it, more so than if you had a much bigger trash bag. So your obligations to monitor, to verify for emission factors that are used that we have not even talked about that require verification increase because to escape major source requirements, you're saying I'll be synthetic minor, easy peasy. I don't have to deal with this, that and the other thing.

But the return obligation is how you're going to prove that you're staying consistent with your presentations as the monitoring obligation goes up proportionally or dramatically. That's what I'm saying.

Q. And Dr. Sahu, I'm sure that you've come across this before, but what happens if a synthetic minor source violates its, you use the word obligations. Its obligations under the terms and conditions of a permit. What happens then generally?

A. Well, first of all, you have to have the verification to know that you're violated. Right? If you just have one stack test or stack test every five years, you're flying blind. So there's a predicate to your question, and that is an important predicate. Do you have enough monitoring to even know that you're violating? Because if you don't, then you have no information. And no information doesn't mean you're not violating, especially in this situation where you're this close to the threshold.

But if you did have monitoring, let's say you have the CEMS for NOx and now you should see a violation there you get a notice of violation. You have to cure that problem. Maybe your controls are not working well. Maybe your combustion system needs tuning, maybe your

fuel mix is wrong. Typically agencies will issue an NOV or NOC or they will issue the enforcement action in other words ensues. And that can take many forms, as you well know. I mean sometimes that can be cured and you retest it and you say, I'm going to stay below. Sometimes you have to come back and ask for, we can't do it, now you have to do a permit modification. Now you reopen the permitting process.

Maybe you have accepted --- or the applicant has accepted. I can't. I've seen an example, I'm dealing with one right now where it said, the applicant itself said no, we thought we were a synthetic minor and now we've tested ourselves, self-reported we're a true major source. Well, they're going through the permitting process. So to get different limits to do the kind of things they avoided in the first place. So it can take several different forms, but it will probably result in an NOV or an NOC.

Q. And just for the court reporter, when we say NOV, we're referring to a notice of violation. So basically what you're saying here is, if there is --- if there are detected exceedances, enforcement action will be taken up to and including cease and desist. It could just be an NOV. It could be, you know, like an order of

whatever. It just --- I guess it would depend on the permanent context. But there are enforcement actions that can and often are and likely would be taken against a facility. Facility where the emissions data showed that it was emitting beyond the level of a minor source.

Is that correct? That was a convoluted question.

A. It was a long statement. You had the question at the end. I want to stress my answer, which is the predicate for that, everything you said I would agree with. But you cannot miss the predicate because you artfully or otherwise did not include the predicate, which is monitoring. How do you even know that you have a problem if you're not monitoring or measuring? You know, as a practitioner, you probably heard this before. It's a very standard thing. You cannot manage what you cannot measure or you do not measure. There's no way to manage to even know without measurement. Because your means of estimating for something as complicated that NOx admissions. NOx is not a stoichiometric bulletin. Measure the fuel sulfur and we'll pretend all of it is oxidized to sulfur dioxide. You can do something. You don't need to measure sulfur content or SO2 all the time. You can do chemistry.

NOx is generated as part of the combustion process. Very complex mechanisms. You have to measure. There is no --- to this day, there is no model that will tell you exactly how much NOx you're measuring or will be generated rather in a turbine. There isn't. And so if you have that measurement. Yes. Then you have the data to be able to decide whether you cure the problem, get into enforcement action, things --- options are available. But you can't simply say which I think is where you headed, which is well, DEP has options. You know, we're not giving these guys a free pass. We will come back and deal with them. They got to comply. They got to comply with their representation. How? They don't have any obligations or permit to do the measurement to begin with. That is the problem.

ATTORNEY DRIVER: Thank you very much, Dr. Sahu. I'll go ahead and pass over to either the Board or the intervenors.

CHAIR: Mr. Yaussy, will you do this or Mr. Walls?

ATTORNEY YAUSSY: I'll take it.

CHAIR: Okay.

CROSS EXAMINATION

BY ATTORNEY YAUSSY:

Q. Dr. Sahu, you're familiar with --- are you familiar with West Virginia regulations regarding startups and shutdowns?

A. I've looked at them. I have not looked at them in the last day or two, but there are no regulations that I know of that define startup and shutdown for turbines.

Q. But they do have regulations dealing with startups and shutdowns.

Correct?

A. They have some requirements generally, but I'm not aware of emissions during startup shutdown regulations or even duration or even how they're defined because that is not general. You have to do it by equipment.

Q. Is there any requirement to have limitations for startups and shutdowns in permits?

A. Yes, they have requirements, but even that's what I commented. We have even numbers for two bulletins for two fuels and for nothing else. And there is no verification for that.

Q. I'm sorry I asked that poorly. Doctor, is there any rule or regulation that requires you to limit

startups and shutdowns or limit emissions for startups and shutdowns?

A. You have to refresh my memory. I think there are general duties. We are referring to that to keep things in good operating order. But beyond that my experience, including in Virginia. Again, I'm looking, I'm just recalling at involvement with at least two or three other permitting issues in the last couple of years in West Virginia. They are all very specific to the type of equipment and the plant. I don't know of a general obligation to limit emissions of the massive emissions of certain pollutants during startup shutdown other than equality to requirement.

Q. So there isn't a requirement to actually limit them the amount of emissions during start of the shutdowns?

A. Not quant --- not quantitatively. That comes from the permit.

Q. If it's not required in the regulations, then it's not required in the permit.

Correct?

A. The permit has --- I mean a good example is there are limits in this permit. They don't appear in the regulation.

Q. I agree. I agree there are limits to this permit that aren't required by the regulations. I think we agree on that.

A. We agree that the permit is bound by the what the authorities of the permitting agency. I will agree with that. But in simple terms, every number that is in a permit derives authority from that, doesn't mean it appears in the regulation.

Q. Are you familiar with 45 CSR1 which is titled alternative emission limitations during Startup Shutdown and maintenance operations?

A. I've looked at that. Again, not in the last couple of days. These --- yeah, AMELs are --- I'm familiar with AMELs in general, yes.

Q. But if I were to ask you detailed questions about it, that's not something you've prepared for for this.

A. You have to share that with me. And it's not a memory test, counsel, so I'm happy to --- you can refresh my memory and you can project it on. I'll be happy to tell you what I know.

Q. There's freely available alternative emission limits that are available for startups and shutdowns that could go into a permit.

Correct?

A. Can you show me where they are in the permit? Then maybe I can refresh because I have that up and open here.

Q. Well, you saw --- you know where at the start the shutdown limitations are on the permit.

A. Yes, I do see that because Mr. Becher showed them to me and I can find it. But I'm talking about this alternative monitoring because I only see one monitoring, which is periodic stack testing. I don't see any alternative monitoring.

Q. No, sir, I'm asking about the regulation itself.

A. Well then you just told me the regulation, Mr. Counsel. Again, to repeat that I have the permit open. The permit is all this applicant has to comply with. And so if there is additional regulations that are not cited in the permit, then I'm asking you to clarify that for me.

Q. Doctor, you referred to there's no monitoring or testing other than the stack testing for before NOx, CO, sulfur oxides and formaldehyde.

Correct?

A. Yeah. I see periodic testing but no continuous

monitoring.

Q. But there is stack testing required for each of the turbines for those substances.

Is that correct?

A. Let me go look at the provision. My recollection is once every five years there's a stack testing, but that's what I remember.

Q. Why don't we look on P. Page 19 of the permit certified record, page 503.

A. Yeah, I'm just about there. I was going there. Yes, that's what I was remembering here. Yeah. Let me ask you. Let me --- I'm on the page. Why don't you ask your question.

Q. Sure. It requires stack testing for NOx, SO2s, carbon monoxide and formaldehyde.

Correct?

A. Yes.

Q. In your experience, that's a pretty common way of verifying emissions for synthetic minor sources, isn't it?

A. No, I wouldn't say it's common way for synthetic minor sources. Many synthetic minor sources have continuous monitors for the reason I mentioned. I'll tell you this. If you had a synthetic minor source

that was not butting up against a major source limit, means you had more margin. You could say, why do I need to put a continuous monitor? I'm so far below. I don't --- I shouldn't have to perform. You can make that argument. I'm not oblivious to that.

Conversely, if you have a source that operates literally steady state, no startup shutdown, it just. And there's no load variability. There are sources like that. You might say if I --- you know, mathematically, if you have emissions that are steady, then yes, you can test them very infrequently because by definition they're steady, they don't change. So you can reduce the frequency of testing.

But if the emissions fluctuate a lot, then just doing them periodically doesn't capture that variability. And that's the problem. Here you have both your variability and you have your butting up against the limit. So a test doesn't do anything for you.

Q. Can you identify any other synthetic minor permit in West Virginia that has continuous emission monitoring required in it?

A. I didn't do that research for this. So I mean again, back to memory test. I'm telling you in absolute terms this is not about who else did what. This is about

what is unique about citing this source in this area, in this location. Our permitting exercise, as you well know, sir, is a case by case determination. You could have a part of West Virginia that has great --- or you know, airflow patterns can handle a lot more impacts and that's different. But our permitting is predicated upon case by case and preconstruction permitting that has come up here, which is astounding to me, you know? And I think you raised that issue which is in doubly astounding, which is you have to do these things before you give permission to build a very expensive piece of equipment as opposed to saying build it and we shall see.

Our preconstruction requirements are doing these assessments up front and they are case by case. So if somebody had it or didn't have it, you look at the circumstances here, I couldn't tell you quite honestly if there's a permit there for NOx at 99.35 tons when a major source is 100 tons in West Virginia. But that is unique to this facility. And so you deal with that issue here. That's my belief.

Q. So the answer is no.

A. The answer is it doesn't matter. The answer is it wouldn't matter even if you had a stack of permits. You still have to deal with the circumstances here.

Q. I will except no for answer there, Doctor.
A. I said it doesn't matter for the record.
Q. We talked about, or you talked about scaling up, you compared --- you said we have to look at the formaldehyde emissions in the context of the carbon monoxide emissions. You said I don't know how many startups and shutdowns there are, but by looking at the difference between carbon monoxide steady state and carbon monoxide allowable startup shutdown emissions, you use the same factor then to scale the formaldehyde.
Correct?
A. Yes. Because your client's application had zero formaldehyde for startup shutdown. In the redacted version, there is no formaldehyde. And I know that's not accurate because it's a product of incomplete combustion. And I know, as I've showed you through other evidence, how dramatically formaldehyde is produced and emitted at lower loads, including startup shutdown, which is typically from 0 to 50 to 60 percent load. And because of that, and using the information I had in the application and showing you and showing the Board that CO is a surrogate, EPA memos and preambles, I said that's one way to show that you're going to be over the major source threshold. That's what I was saying.

Q. It seemed to me that you were showing that CO was a surrogate formaldehyde steady state. I missed it here in your documents where you showed that CO was a surrogate as far as the rate of formaldehyde during startup and shutdown.

A. Let me clear that up for you. Combustion chemistry says when you have incomplete combustion, it creates a range of things like CO, benzene, formaldehyde, whole bunch of VOCs. And I've shown you separately, and that's the point I made, is when we do have test data, how dramatically that formaldehyde is created during lower loads. I only used a factor of two in my calculations. And that actual testing is, if you recall the numbers, depending on what Mr. Becher showed me, the different panels that's there before the Board. Factor of three, factor of four, factor of 20, factor of thousands. I did not rely on that memo to scale this up even dramatically. I said even if you use a factor of two, which is understating that surrogacy during non-steady conditions, you're over the limit. Does that answer your question?

Q. No, it doesn't. Exhibit 2.

A. Well, let's look at the exhibit that has that because I do want to make sure that the Board understands

it.

Q. We're going to get to that exhibit. Let's look at Exhibit 2. Do you have Exhibit 2 there?

A. Yeah, Exhibit 2. Which is that? Because I have exhibits numbered a little different ---.

Q. Exhibit 2 is August 21st, 2001 memo.

A. Sure, let me get to that.

Q. I'm assuming that somewhere in here --- and I missed it because I kind of didn't have a chance to read it real closely, somewhere in here it says that there's the same ratio of formaldehyde generation during startup shutdown as there is the ratio of carbon monoxide during startup shutdowns.

A. Yeah. This memo, the part that was quoted to the Board is on the top of the second page, it says carbon monoxide is a good surrogate for formaldehyde and other HAPs. No qualification about steady state or stop shutdown at all time. Okay?

So that's what that memo says. You're not a combustion chemist. I'm a combustion chemistry person. I'm telling you the reason EPA didn't qualify that. You can make your legal points, I get it. But that's a statement without qualification. That means again, for the nth time, repeating what I said earlier. When

combustion efficiency decreases as a function of load, it creates all of these unburned, incomplete combustion products. And so CO being a representative of that is true for all conditions. It's not just at steady state.

Q. We're not disagreeing that there may be some relationship between CO and formaldehyde. I don't know. It won't concede it, but I don't know that. But I don't see anything in this memo, Exhibit 2, or in the data that you've put together which indicates that there's exactly that relationship and it stays the same regardless of whether steady state or startup or shutdown.

A. Oh, believe me, I'm not saying it stays the same. I'm saying for the purpose of why is this important here? Your client has claimed that you're a minor source, that formaldehyde will below 10 tons, having completely omitted any formaldehyde from startup shutdown for either fuel.

Let's define the playing field here. Your client and the application says we have two steady state numbers. One for natural gas, one for diesel, and zero for startup shutdown for either fuel. And based on that, you claim that you're below 10 tons. I'm saying that's a big, huge gap. If you make even a reasonable attempt at filling it even with a factor of two, you're over. And I

agree with you. I've shown you data that the factor of two is insufficient. It may be more than that. And that would just further my conclusion that you're not a minor source. That's the context for getting all the confusion you're trying to add to your question. Let's talk about that.

Q. You're talking about rates of emissions during startups and shutdowns.

Correct?

A. Yes.

Q. How long does each startup or shutdown last?

A. Turbine startups for this type of duty can be 15 minutes, 10 minutes, maybe 12 minutes. That's to spin up and then the end of startup can sometimes be up to 30, 40 percent load, 50 percent load, maybe an hour. So that's typical. And you just produce so much in that, in those minutes it's dramatically high. That's the point. But startups are typically in that range. Anywhere from these are you have not fast start turbines that can spin up pretty quickly, you know, in about 10, 15 minutes, but to reach load they might take a little bit longer, something in that range, an hour or less.

Q. So you have current turbines that can start up much quicker than some of these older turbines that you

have in exhibit --- referred to in Exhibit 4.

A. Yeah, I think you're missing an important point. Those results in Exhibit 4 are for concentrations, sir. They're not for the total mass. They're not pounds per hour. They're not pounds per minute. They are the concentrations that you get parts per billion in the exhaust, even if you have a fast start turbine for 15 minutes, you will still have dramatically high concentrations and the mass that attaches to them. So the results are reported as concentration. But of course you have different mass depending on the size of the turbine. So the commonality there is the concentration in the smokestack. That's what that is showing is the load function.

If you have it for 15 minutes, you have less mass. But here my scaling applies because you have the same thing with less CO as well. You see the beauty of having the information that I have and using it is whatever your duration is, whether it is fast start or not, the CO is also happening in the same time as the formaldehyde. What you cannot have is one set of startup conditions for formaldehyde and a different set of startup conditions for CO. The scaling works because whatever the heck is hidden behind the black redactions

applies equally to both CO and formaldehyde. That's why it's done that way.

Q. That is an assumption that you are making that scaling applies equally between those two different fluids.

A. No, no, let's not get carried away without, you know, common sense logic failure. You're starting up a turbine, the duration, whether it's 8 minutes, 12 minutes or 15 minutes, it is what it is. You produce a bunch of CO, you produce a bit of a bunch of formaldehyde. The CO is reported for that duration, whatever that report --- that duration is, which is not spelled out, whatever that might be, the end minutes, the missing minutes, 8, 10, 12, an hour, whatever it is, you have --- your client has reported CO as a startup number. I'm saying the formaldehyde will be produced in the same time frame. You're going down the line saying, oh, these results are older, but now you have fast start turbines. That has nothing to do with it.

A. You're completing two very different things you're scaling here that I've done using your CO numbers and formaldehyde is for the same startup conditions even though it is redacted. As for the memo, those are concentrations, they're not mass numbers. And I've not

used that other than to point out that my scaling of factor of two is dramatically low. I could have used from that data a much higher scaling number simply from further making the point that this is clearly a major source. I didn't need to do that. Even with a factor of two, you fail to be a minor source.

Q. Dr. Sahu, looking at Exhibit 4. There seems to be quite a range of formaldehyde emissions based upon the type of turbines. Is that fair to say?

A. They're all gas fired turbines, they're all lean pre-mix. I'll point you to --- I made that point earlier. They have different conditions but all of these are lean pre-mixed combustion turbine test reports. Look at the very first sentence in the memo. And they're all measuring formaldehyde. Different test methods, that's another important fact. But no matter which test method you look at, the load variability is dramatic.

Q. Even comparing them between turbines, there's a difference in formaldehyde emissions. You'd agree with that.

Correct?

A. Yeah, you can. You can get formaldehyde but the ratios are sky high and none of them show that you have no formaldehyde at zero formaldehyde during startup,

which is what is in the application right now, which is what the permit is based on. None of them support the idea that you'll get zero formaldehyde. That would be possible if there were some tests. But as your load decreased you got down to zero. You got down to lower formaldehyde. You don't see that. You see quite the opposite.

Q. Exhibit 4 was a memo --- is a memo drafted June 23rd, 2003. Is there been any improvement in turbine technology since --- in the last 22 years?

A. There's been improvements in turbine technology but the lean pre-mix drop turbine technology is still being used. In fact that's the most common. There is no improvement. If anything things are actually worse because the focus has been on NOx. To tell you the truth, in the turbine world there have been improvements to reduce NOx emissions. Previously NOx emissions were 40, 50 parts per million. Now they're in the 15 parts per million or 9 parts per million. But the resultant that is CO and formaldehyde actually are dramatically higher. I mean just like in your car engine you control for NOx, CO actually goes up that's the nature of combustion. You're controlling one pollutant in conditions, the other one goes up.

Same thing is because the driver for improvements and there have been is on the NOx side, that has actually had the dramatically opposite effect on VOCs, CO and formaldehyde. That's where we are.

Q. Doctor, are you aware that heat input is one of the factors that has to be monitored for the --- for the turbines?

A. Heat input for an overall time period, I don't see the relationship between heat input and emissions, which is that load relationship. That's not required in the permit. There's a requirement to monitor total amount of heat or total amount of fuel, but that doesn't talk about load. You can have all that in one load or in various loads. We keep, you know, bringing out permit conditions. I looked at those conditions. They don't tell you anything about the load variable.

Q. I take that as a yes. The permit does require monitoring heat input.

A. Overall, but not at different lows, which is where the action is from an emission standpoint. You can't measure over here and say, therefore it applies here. That's not how science works. You need it to be in the same way. You're not monitoring --- there's no requirement, unless you can show me, to monitor heat

input during startup shutdown events.

Q. You're also required to monitor the fuel input.

Correct?

A. Same thing whether it's gas or diesel, I'll give you that. But within each one of them there is a load relationship. There's no requirement to monitor or measure during events.

Q. And you're required to keep track of the hours of operation and the conditions of operation.

Correct?

A. Hours, yes. I don't know what means by --- what means by conditions. I mean, the hours is a number. But again, that tells you nothing about emissions at load because it's not telling you how much hours at which load and what those emissions will be. It's an overall.

Q. You have to identify whether it's a startup or shutdown condition.

Correct? In the permit.

A. Yeah, but how is that translated to emissions? In other words, you don't have --- even if you said, I'm spending 20 hours, let's say I made up a number in startup, what are you going to do with that? What emission factor or what pounds per hour for those 10 hours or 20 hours would you use to estimate emissions?

There's nothing in the application that does that for formaldehyde.

Q. Doctor, all I'm trying to do is get you to confirm what's in the permit. Can you do that for me?

A. Yes, and I'm confirming what is there. And also going saying that it doesn't matter for the points I'm making. And you're trying to confirm with the idea that you're going to get a sound bite out of me that the permit is okay. Well, I wish I could give it to you. All I can tell you is the few conditions that are there do not protect and do not provide any assurance that this is a minor source or synthetic minor source. With your permission, Counsel, I'm going to pour some Diet Coke in here if that's okay, because that's my drug of choice here today. So that's --- I pardon the noise.

Q. No, that's fine. One more question about the permit and the requirements monitor. The permittee is required to operate in accordance with manufacturer's specifications.

Correct?

A. Yes. And in the redacted version, I have no idea what those specifications are.

Q. Has to keep --- has to properly operate it.

A. Yeah. That means, you know, it's like saying,

you know, I'm not going to quote you Supreme Court rulings, but it's what is love and pornography is the eyes of the beholder. So it means --- it means whatever you want it to be. It's qualitative, you know. Do you love mom? Do you salute the flag? Do you love apple pie? Yes, to all of them.

Q. So you think those conditions are meaningless, then?

A. Their conditions are unenforceable. They're not meaningless. They're unenforceable.

Q. You can't enforce a requirement that the turbines be properly operated.

A. Right. What would you do? So if you come to them as an agency that you're not --- the only indicia of improper operation is emissions. And if you're not measuring emissions, what is your grounds to going back to them and telling them you're improperly operating anything? I mean, the first thing, if I'm representing First Air, I would say, well, what do you mean? My emissions are okay. I must be operating them correctly. It's a circular argument. And here you don't even have monitoring.

So why and when would you go to this company and say you are, sir, operating your turbines improperly?

On what grounds? No grounds. Because you're not. You don't have any data. It's your word. Based on what? And they'll be right to challenge that. They would say, well, wait a minute, it says you. I'm doing fine. So that's why it is unenforceable.

Q. You said that loading is a key to formaldehyde emissions.

A. And VOC and CO. All of them, yes.

Q. But as far as conditions, you'd also be talking about the time of being in startup or shutdown, hot versus cold start. All those things?

A. All of those. And don't forget, the only reduction, the pollution control for any of these class of pollutants is that oxidation catalyst. The permit has no requirement of when that should kick in, either as a function of heat input or temperature or even that it should be maintained properly. And it's not abrading, or it has to be --- its activity has to be checked. It's not a one and done. These catalysts deteriorate and that's even at higher loads, there's no requirement. And of course it won't be hot enough during startup shutdown. So it won't even operate.

Q. You said that vendor guarantees you feel are useless in part because you've never seen them guaranteed

at different levels of turbine operation.

A. Yes. Not for the turbine manufacturers. And I've seen guarantees for, I think, half a dozen of the important ones. And they're limited. They're not in different conditions. They're, as I mentioned to Mr. Driver before, the limited time, highly specified conditions that do not represent the totality of actual operating conditions. They're basically a very limited sort of passing of an acceptance test so they can fulfill their contractual obligations. Usually there's a holdback in these contracts that until we pass those, you don't get your last 10 percent of the money or whatever you are owed under the contract. So they're geared to satisfying that requirement and making sure the contractual obligations are fulfilled.

Q. If you could, if there were NOx --- you were asked about NOx CEMS by Mr. Driver.

A. Sorry, I didn't get your questions. Say that again.

Q. You were asked about NOx CEMS, continuous emission monitoring by Mr. Driver.

A. Yes.

Q. And you --- as I understood you said if there were NOx CEMS on this, that would be a good indication of

proper operation.

A. Well, that will give you the data to see if you're exceeding your permit limits. In other words, that would be the actual data if those CEMS were installed and actually operating. Then that would give you the ability to monitor and have data which you can then aggregate. You can --- I mean, you put the CEMS in and then you operate. And then that data will tell you over a period of a year, are you emitting 99.35 tons? Are you emitting 80 tons? Or are you emitting 115 tons? And that data will then help you. Are you meeting your 99.35 or are you not? So the CEMS is a measuring instrument. It will give you the data to make that assessment.

Now, if it was over, you can go back and see why did that happen? Are you not operating it correctly or are you reading your specifications? It can generate those questions, but without that data you have no ability to ask those questions.

Q. But as written, NOx is the limiting parameter, limiting pollutant for minor source status.

A. According to the calculations done and because of limited resources, I haven't analyzed for everyone. But NOx clearly is laughably close to its major source

threshold. I cannot stress this enough. Maybe some people think that air pollution measurements are so precise that you can distinguish between a 99.35 and 100 tons. I here to tell you as somebody who's been dealing with this for 35 years, they're not that precise. There's a lot of variability and therefore they are one and the same. But if you had the measurement and you were exceeding that, you could do something about it. And it is a limiting pollutant because it's closest to that major source threshold. And then formaldehyde for other reasons that I mentioned.

ATTORNEY YAUSSY: Mr. Chairman. May I consult for a second? I may be ---.

CHAIR: For a second.

ATTORNEY YAUSSY: Nothing further, Mr. Chairman.

CHAIR: Redirect?

ATTORNEY BECHER: Briefly.

REDIRECT EXAMINATION

BY ATTORNEY BECHER:

Q. Two issues, Dr. Sahu. And I'll tell you I want to make sure we get into the confidential portion of

this. I think the Board has a stop at 4:00. So we'll try to be brief. But I just want to clarify something first on the carbon monoxide formaldehyde relationship. Looking back at the CEMS memo, I believe that's Exhibit 2. That surrogacy of the limit. That's based because the pollution controls work the same on carbon monoxide and formaldehyde.

Correct?

A. It's the same oxidation catalyst for two reasons. It's not just the pollution control. It's also the way they're generated is similar because that's in the combustor. And then the only control for both of those and for VOCs in general is the oxidation catalyst.

Q. And the reason they're higher on startup and shut down is because it's at lower temperatures, lower lows with that oxidation catalyst, it's not working.

A. More is created first. I cannot stress that enough. More is created. And then the pollution control is not effective. They're both important.

Q. So because they're created in the same way and controlled in the same way, they are proper circuits for one another.

A. As a first cut. It's a reasonable assumption. Correct.

Q. I want to take you back to a question from Mr. Driver. Do you recall he asked you if this stayed below the max operating hours, that it would stay below pollution levels? Do you recall that?

A. Yes.

Q. I would like you --- I'm going to ask you to do some, I think simple, but some math here based on a section in the permit and certified record, page 58, 59.

A. Fifty-eight (58), 59. Let me just get it. In the two hundreds here. Okay, I am on page 58.

Q. If operating exclusively on diesel, we're allowed to operate for 25,000 hours. The permittee is allowed to operate for 25,000 hours.

A. Okay, so I'm on page 59 then, because 59 is the diesel. Yes, that's the max is 25,000 hours on diesel. Correct.

Q. And how much NOx will we get on annual basis.

A. Their calculations show ---.

Q. Let's just look at --- let's just look at steady state and ignore the others.

A. It's 93.13 times.

Q. And then if we operated to our limit under the natural gas exclusivity, what would be our total annual emissions.

A. As on the previous page, that one --- that one will be 94.43, I believe. Again, steady state not --- you're extremely excluding the startup shutdown even as represented. Correct?

Q. Correct.

A. Just steady state, you're in the high 90s for either fuel.

Q. If you add those two together, are you over the NOx limit for a minor source?

A. Yeah, but I wouldn't add them together. I know where you're going. Because the permit therefore limits on either fuel the max of the 99.35.

Q. How would you determine if that max is being met? Say you're operating with --- on the throttle number here, six turbines for a cumulative 15,000 hours on diesel.

A. The only thing you have to do is you can --- you have to assume, and that's a big assumption, that the hourly numbers are what they are and then multiply by the number of hours that you recorded and add those up for each fuel. That's what you would do. My problem is the hourly numbers are a function of load. You don't have measurements other than the stack tested 100 percent load.

Q. And in addition to that, the hourly measurements are for functioning of all of the turbines,

Correct?

A. Correct.

Q. So if you have a subset of that and you don't know how many turbines there are, you can't tell how many those subsets of turbines are new. You can't tell an hourly load for that number of turbines.

A. You cannot. Other than assuming what is already listed there with no verification.

Q. And even the assumptions, that's listed here, again, that's for the operation of all the turbines.

Correct?

A. Right. And that --- that is. That's all we know from the redacted ones. And they will say that's the PTE and that's for fair for PTE. But again, NOx will deteriorate over time. The catalyst will deteriorate over time. Those pounds per hour numbers are different and they will not be the same for every turbine, however many there are. These are individual machines. You cannot simply say every one of them has the same. They're not identical. You can have two of them side by side and test them. You saw that EPA preamble in the same station, Waterloo. There was a unit 7, there was a

unit 8. Really identical on its face. One had vastly different emissions than the other. So these are all assumptions and without any verification. You're just relying on arithmetic and algebra with no real understanding of what's being emitted in the smokestack.

Q. And you can't even do that arithmetic when you're operating less than the full number of turbines without. Without knowing the number of turbines to scale --- to do that scaling.

A. Yes, that's correct.

ATTORNEY BECHER: Nothing further.

CHAIR: Okay.

Anything else? Board, any questions? We need you stay on please. At this point we're going to move into ---.

ATTORNEY DRIVER: Mr. Chairman, this is Scott. I have a couple of brief recross questions.

CHAIR: Go ahead, Mr. Driver. Just make it brief and not repetitive.

ATTORNEY DRIVER: I will endeavor to do so which is pretty much worse what's coming from a lawyer. But I will try here.

RECROSS EXAMINATION

BY ATTORNEY DRIVER:

Q. Dr. Sahu, I want to make sure to clarify for me and the Board. I think you equated or maybe conflated formaldehyde exceeding 10 pounds a year with NOx exceeding 100 tons per year. I'm sorry, tons per year for both.

Is that correct? Are you equating?

A. I didn't conflict. I didn't intend to, if I did, I missed. So I simply was saying that each of those pollutants has a different threshold when it becomes major. Formaldehyde it is 10 tons a year. For NOx it is 100 tons a year.

Q. And what are --- are the ramifications the same if either one of those exceeds that threshold in a permit application?

A. Yes. Then you get a major source permit. If the NOx exceeds 100 tons, you get a PSD permit, a prevention of significant deterioration permit or what's called a non-attainment permit. If the ozone area is not in attainment and that has requirements for best available control technology or lowest available emission rate. It has requirements for modeling. It has requirements for modeling in the immediate area but also

at class one areas. It has all those ramifications. It has requirements to look at what's called air quality related values like visibility and haze and deposition, acid deposition. So it has a number of additional analysis because it's a major source. For formaldehyde, which is a hazardous air pollution, there are requirements to meet what are called maximum achievable control technology standards. And so it has its own sort of requirements. So it depends on the pollutant.

Q. And you're solid on that position?

A. I'm very solid that each of these NOx is a criteria pollutant with 100 tons per year threshold. Formality is a HAP that is 10 tons per year for that individual HAP. There's a separate major source threshold for all aggregate HAPs and that is 25 tons per year.

ATTORNEY DRIVER: Thank you for the clarification, Dr. Sahu. That's all I've got. I'll pass the witness.

CHAIR: Okay.

Dr. Sahu, if you just hang on for a little bit. At this point we're going to clear the room. As I said, we will not reconvene today in public. We will reconvene tomorrow morning at 8:30. We will also ---.

MS. DERAIMO: Well, yeah, if everybody gets off of Zoom and it's the same link tomorrow. But I'll make sure it's on the website and everything for anybody that doesn't have it. But make sure you remove yourself now because if I remove you, if you're online, you may not be able to join in the same way tomorrow. So if you're on your computer, you may have to call one of the phone numbers if I end up having to remove. So we're going to be going to a closed session. So everyone on Zoom, please remove yourself.

(WHEREUPON, A PAUSE IN THE RECORD WAS HELD.)

CHAIR: All right.

We are now back in session. So we're in the CBI portion and Mr. Becher, go right ahead.

ATTORNEY BECHER: Thank you, Mr. Chairman.

CONFIDENTIAL PORTION BEGINS

CERTIFICATE

I hereby certify, as the stenographic reporter, that the foregoing proceedings were taken stenographically by me, and thereafter reduced to typewriting by me or under my direction; and that this transcript is a true and accurate record to the best of my ability.

I certify that the attached transcript meets the requirements set forth within article twenty-seven, chapter forty-seven of the West Virginia Code.

Chassidy E. Bays,
Court Reporter