COMMONWEALTH OF PENNSYLVANIA

PUBLIC UTILITY COMMISSION

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Amended Application of Duquesne Light Company. For the siting and construction of a 138 kV line in Hampton, McCandless and Ross Townships, Allegheny County. : Docket No. A-110150 F0031

Mark R. Janosko v. Duquesne Light Company. : Docket No. C-20065987

Initial Hearing.

- -x

Pages 263 through 427

Hearing Room 2
State Office Building
Pittsburgh, Pennsylvania

Tuesday, July 11, 2006

Met, pursuant to notice, at 10:00 a.m.

BEFORE:

FRED R. NENE, Administrative Law Judge

APPEARANCES:

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P R O C E E D I N G S

ADMINISTRATIVE LAW JUDGE FRED R. NENE: We'll open the Record. This is the time scheduled again for an initial hearing on the amended application of Duquesne Light for the siting and construction of a 138 kV line in Hampton, McCandless and Ross Township. Its docketed with the Commission at A-110150F0031. The applicant is present represented by attorney Regina Sestak and we have people who have filed formal documents in opposition to the construction and siting of this line as planned and some of those cases were docketed as complaints and some of those complaints were docketed as protests. For the sake of uniformity, I'm going to refer to all of those who were opposed, formally on the Record in opposition, as protestants to the application.

Protests or complaints were filed by Oleg Lapets, L-a-p-e-t-s, O-l-e-g, P-a-w-e-l, Kalinski, K-a-l-i-n-s-k-i, Bruce Krist, K-r-i-s-t, Terrance Nypaver. Is that correct?

MR. NYPAVER: That's correct.

JUDGE NENE: N-y-p-a-v-e-r. Delores Nypaver. Husband and wife?

MR. NYPAVER: Yes.

JUDGE NENE: And Mark Janosko, J-a-n-o-s-k-o.

A late received complaint was filed and given a Docket No. C-20066500. The protestant in that case is

Raymond Jacobs, J-a-c-o-b-s, and that was filed on June 19th, and the time for the filing of an Answer has not yet occurred, so there is no Answer filed yet to that complaint. The other protestants have been answered by Duquesne Light in due course.

The purpose of this -- we have held three sessions of public input hearings and transcribed the testimony of quite a few concerned people. I would say every one of those who testified was against this line. There was a gentleman from Equitable, but he was not sworn. His testimony is not part of the Record. He indicated that Equitable Utility Company would cooperate with Duquesne Light in moving their lines if necessary for this project.

So, I'm going to ask Ms. Sestak to present the evidence that Duquesne Light wants to provide to the Commission for consideration. After that, the witnesses presented by Ms. Sestak and Duquesne Light will be open to Cross-Examination by the named protestants that are here in the hearing room today. When Ms. Sestak and Duquesne Light complete their testimony, we will take Direct Testimony from the protestants, who in turn may be cross-examined by Ms. Sestak.

Following that we will have a transcription of the testimony made to complete the testimony that we have already taken and then we'll ask for briefs on the matter.

Following that, I will issue an initial decision, submit that to the Commission, to all the parties and the parties can take exceptions to the ruling that I make by filing the same with the Commission.

The Commission can do as they choose and that will be the decision that the PUC makes.

Off the Record for a minute.

(Discussion off the Record).

JUDGE NENE: We're back on the Record and I just want to make sure that the Record indicates that Mr. Oleg Lapets is present along with Mr. Kalinski and the Nypavers, Terrance and Delores.

Is there anything else we want to address by way of housekeeping before we begin to take testimony?

MS. SESTAK: Your Honor, I would ask that you take notice of two specific Public Utility Commission regulations that have a bearing on this matter.

The first is regulation 5775(e) and although --

JUDGE NENE: 5775(e)?

MS. SESTAK: Yes. I am not submitting this as an Exhibit, of course, but I do have additional copies for yourself, if you would like one, and for the other parties here present today. I'll keep one.

This regulation sets forth the criteria in sub (e) of what is to be considered by the Commission in determining

the placement of a high voltage transmission line.

JUDGE NENE: Fortunately, I have read it.

MS. SESTAK: Your Honor, I assumed that you would be more than familiar with this.

I'm also asking that you take notice of another Public Utility Commission regulation, Section 57.193(a), which I'm also providing copies of to the protestants. This is the regulation that requires electric utilities -- electric distribution utilities in Pennsylvania to follow the National Electrical Safety Codes in transmission.

JUDGE NENE: Well, that's -- we'll take judicial notice of that because its part of our regulations.

MS. SESTAK: Thank you.

JUDGE NENE: Okay. Ms. Sestak, the floor is yours.

MS. SESTAK: Thank you, Your Honor. I call Homer Zucconi.

JUDGE NENE: Maybe for the sake of moving things along, I could ask all of those initially for Duquesne Light who intend to testify to please stand now and raise your hands and we could save a little time.

(Thereupon, various and sundry witnesses were duly cautioned and sworn).

JUDGE NENE: Thank you. The witness can come up here. Mr. Zucconi, we'll begin the testimony and Ms.

Sestak will do it, but in the beginning I would ask you to -- Ms. Sestak, you'll ask the witness if he or she is sworn and then to state and spell their names. Thank you.

HOMER ZUCCONI,

having been previously duly cautioned and sworn, testified as follows:

DIRECT EXAMINATION

BY MS. SESTAK:

Q Mr. Zucconi, have you been sworn?

A Yes, I have.

Q Would you please state your name for the benefit of the Record and spell your name.

A Homer, H-o-m-e-r, Zucconi, Z-u-c-c-o-n-i.

Q And, Mr. Zucconi, did you prepare written testimony for this matter?

A Yes, I did.

Q And this written testimony that has been previously provided to the Judge and to the participants, the protestants, labeled with tab No. 1, is that your written testimony that you prepared?

A Yes. Yes, it is.

Q And the documents attached thereto labeled HR 1 -- I'm sorry, HZ 1, HZ 2 and HZ 3, are those documents that you either prepared or obtained from Duquesne Light's records and identified in your testimony?

A That's correct. Yes, they are.
Q Mr. Zucconi, based upon the information that was presented at the public input hearing, I have a few additional questions to ask you, but first let me ask you, if you were to testify orally here today, would you answer questions substantially the same as you answered in your written testimony?
A Yes, I would.
Q Is there anything that you feel a need to correct or change?
A No.
JUDGE NENE: Can everyone hear Mr. Zucconi? Most importantly the Court Reporter.
BY MS. SESTAK:
Q Mr. Zucconi, in reference to matters raised at the public input hearing, does Duquesne Light, to your knowledge, have any intent to use the substation to expand into Cranberry or Butler?
A No, we don't. Duquesne Light has a franchise territory that was set up years ago and it covers all of Beaver County and the major portion of Allegheny County, okay, and we have no intentions of violating that agreement by going outside of that territorial boundary to serve some other territory.
Q Okay. What was the purpose in the project to

increase the voltage to the Wildwood Substation?

A Well, we have a ring system that has two nearby bulk supply substation called Pine Substation and North Substation, which are at or have exceeded their thermal ratings.

JUDGE NENE: Did you say thermal?

THE WITNESS: Thermal ratings, yes, Your Honor.

A (Continuing) In order to relieve those overloads we needed to build or site a substation in the area where the growth in our territory is at and that substation has to be fed from the ring system, also from 138 kV.

Presently there is an older 4 kV built in 1938, it was a less populated area. The load has grown and the capacity to supply that load from the existing substation has been reached and that substation is also overloaded.

Q That is in your Exhibit No. 2; is that correct, the peak load information?

A Yes. Yes, it is.

Q Now, you used a term just now, you said was it a bulk supply substation.

A Yes.

Q B-u-l-k?

A Correct.

Q You talked about thermal limits. In your testimony

you mentioned that when a substation or other equipment is overloaded, it can reduce the life of the equipment. Would you expand upon that, please.

A Yes, I mentioned that the -- by running equipment at its stated rating or over that, you accelerate the loss of live of that equipment.

We base a lot of our ratings on an institute that is called ANSI, American National Standards Institute, and in that document they look at major pieces of equipment such as a transformer that are in our major bulk supply substations and they rate those accordingly.

They will take a transformer and run it at its rated name plate 365 days a year until it fails and that is normally around seven years. That's flat out running at that capacity for seven years.

Our equipment doesn't run that way. Okay. There are cyclical loads on that substation, okay. The loads peak in the afternoon, lower in the evenings so on and so forth. Okay.

So, we take that basic information and extrapolate that and there's an accepted standard that regular transmission distribution equipment will last approximately 20 years or more with that cyclical loading in it. So that's why we're referring to an accelerated loss of life.

If you run it at loads greater than its rating, you

accelerate that loss of life so that that piece of equipment will fail before the 20 years or more that its assumed to be able to carry load.

Q You mentioned needing a 138 kilovolt supply to the Wildwood Substation. Why is -- would that be the sole source of supply to that substation?

A Yes, it would.

Q And in a situation where there is only one source of supply to a substation, how would you characterize the need for reliability of that source?

A Very high. If I may draw a diagram over here on the board to explain what I want to mention.

JUDGE NENE: Yes, you may.

MS. SESTAK: You can just flip the map over.

THE WITNESS: I will. I have a marker that I brought with me.

A (Continuing) As I mentioned before, we have a ring system that our territory is supplied by and its 138, primarily a 138 kV system. It might be helpful to show that first.

Let me -- its in there. I'll just hold this up for a few minutes to kind of explain what I'm talking about.

Q What you're holding up is the document marked HZ 1; is that correct?

A That's correct. I think most of you can see our

territory here. The red is what I'm talking about. Its kind of a ring. Okay. That's our 138 kV ring system. All of our bulk supply substations are fed from it and most of those substations have two or more 138 kV lines feeding into them. The point for that is that if you break the ring on one side or the other of that substation, the power can flow through the ring the other way and still supply that substation.

Now, the point that I want to make as far as the new Wildwood Substation up here that has to have a line that's fed from this ring is this -- I'll simplify this ring. This is North Substation and we have transmission lines into it. These little squares that I wrote over here are breakers on the circuit. They are much like the breakers in your home.

If a fault were to occur on this line, this breaker and this breaker would open up taking this line out of service. But as you can see, there are other lines feeding into these substations. There are multiple substations around this ring. North Substation is the substation that's in question as far as running a line from here up to Wildwood.

If I was to tap this line and run it up to Wildwood and a fault were to occur on this line, this line would go down and also the substation, it would be out of power and our long-term plans are for this substation to carry a load

up to about 30 MVA, 30,000 KVA of load. So, to make this a more reliable substation, we propose to have a dedicated line at North Substation to feed that.

Now, what happens there is if a fault were to occur on this line or any of these lines, that line would go out, but as I said earlier, the power to North Substation would be picked up by the other transmission lines and thereby also maintaining service to Wildwood Substation because it has its own dedicated line on the buss at North Substation.

So, it becomes a much more reliable source for Wildwood than if we were to tap one of the lines that are in the neighboring area.

Q Thank you. Is there anything else that you would like to say to clarify or explain your testimony at this point?

A Not at this time, no.

Q Thank you.

JUDGE NENE: Thank you. We'll use the same order for Cross-Examination, start with Mr. Nypaver. Now, this goes to the testimony that relates to the need.

MR. NYPAVER: Okay. I'll wait until he gets done with the map.

JUDGE NENE: You understand that on Cross-Examination that the Cross-Examination is limited to the testimony that was presented.

CROSS-EXAMINATION

BY MR. NYPAVER:

Q You mentioned that you were having a -- you were tapping out from a breaker out of North Substation. Was that the goal of all routes of the study; did all the routes go to the substation?

A Ultimately, yes, but just this --

Q Answer the -- where did they terminate at?

A All but one terminated on the tap of one of those transmission lines.

Q So the study did not go all the -- all seven routes did not go back to the substation? All of the seven proposed routes went from Wildwood Substation not to North but to either North Substation or a tap off North Substation; is that correct?

A That's correct.

Q So right now the study is not complete because you never studied all the routes to North Substation?

MS. SESTAK: Objection. This question calls for a conclusion from the witness in terms of characterizing the study as complete or incomplete. The appropriateness --

JUDGE NENE: Well, he testified he had done the study.

MS. SESTAK: No, Your Honor, he did not testify that he had done the study. The study was done by

GAI and a witness from GAI is here to testify.

JUDGE NENE: Sustained. The objection is sustained.

MS. SESTAK: Mr. Homer Zucconi testified he was the system planner designing the overall project.

BY MR. NYPAVER:

Q You talked to reliability issues as well, but also in your testimony on page 6 you had mentioned about storm and vehicular incidences causing problems with power in general, power transmission in general.

How do you see -- when you say storms, what kind of storms do you mean?

A Electrical, snowstorms, wind storms, we primarily have rain and wind and electrical storms in the summertime and snowstorms with some wind in the wintertime.

Q Okay. What about ice storms?

A They're not that prevalent in that area. We do have them, but they're not that common.

Q What would be the -- I mean, I know some are, you know, some are brief breaker trips or whatever, some are brief faults so that the man is going back and resetting the breaker, meaning in the line trips and the breaker trips, someone would go out there and reset the breaker.

A Most of the breakers are remotely controlled or set up automatically. If a tree comes down on the line and it

stays on the line, the breaker stays out.

Q What storms cause the most damage as far as your distribution system, meaning affects and like --

A High winds.

Q All right.

A Hitting the trees.

Q But putting this line through North Park and also Thompson Run Road, you're also in some travel areas where the poles are not protected by guard rails. What -- and you mentioned vehicular accidents. So, if somebody crashed into a pole on Thomson Run Road or Peoples or Ringeisen --

JUDGE NENE: I'm going to have to stop you there. There's going to be plenty of time to ask questions. This witness did not testify as to those items.

MR. NYPAVER: But he did mention vehicular incidents in his report, Your Honor, and storm incidents, okay, on page 6.

JUDGE NENE: Page what?

MR. NYPAVER: Page 6.

THE WITNESS: That apples only in reference to the reliability of any given circuit, that the cause of outages are usually attributed to trees, vehicular accidents, equipment malfunction, equipment failure. That's what I was referring to.

MR. NYPAVER: Okay.

JUDGE NENE: I think you're going to have plenty of time to get into those issues.

MR. NYPAVER: I just wanted to mention to you that he brought that up, Your Honor.

BY MR. NYPAVER:

Q What is the rating of the cable that's going to be installed, ampacity, ampere rating capacity?

JUDGE NENE: You're got to enunciate a little better.

MR. NYPAVER: Okay. All right.

BY MR. NYPAVER:

Q Each cable has a certain capacity carrying currents and I want to know what the ampacity of the --

A There is a table. I don't recall what size they are designing to, but generally a transmission line is good for 200 megawatts, but this tap does not have to carry that much load. Its going to go up and feed more than 30 MVA. I can't answer that question.

Q You were an electrical engineer and I didn't know if that was your area or not. Being that it is an isolated leg, would Duquesne Light -- is there a possibility -- is there -- you mentioned you're tying into the substation there.

A Yes.

Q Is the load strictly out of the substation now going

to be carried by the new line?

A Would you state that again.

Q Will the load out of the -- the new line that's being installed, will all the load from Wildwood Substation be through that new line?

A That's correct.

Q Okay. All right.

MR. NYPAVER: I do have a couple Exhibits, Your Honor, just for clarification.

JUDGE NENE: You have copies for Ms. Sestak?

MR. NYPAVER: Yes. I gave the witness one so I can give -- that was one -- I think I have it here. Let me mark that. I did not know the order the witnesses would be in. I'm calling this B and C.

JUDGE NENE: Nypaver B and C. Okay. Nypaver B and C. That's good.

MR. NYPAVER: Did I mark C on the second sheet?

MS. SESTAK: I'll do that.

MR. NYPAVER: Here's the other one.

(Thereupon, the documents were marked as Nypaver Exhibits B and C for identification).

BY MR. NYPAVER:

Q Exhibit B, Nypaver B is an aerial view of the

substation.

A Uh-huh.

Q It is near the -- I did try to draw a circle, it didn't come out on the copy.

A Right there.

Q Its near the long building up in the upper right-hand corner. Is that the substation?

A That's correct.

Q The Wildwood Substation?

A That's where it sits right now, yes.

Q Exhibit C shows the substation and also the view of the substation from West Hardies Road, do you agree to that?

A That's correct.

MR. NYPAVER: Okay. No more questions, Your Honor.

JUDGE NENE: Are you moving these Exhibits into the Record?

MR. NYPAVER: Yes.

JUDGE NENE: Do you have any objection, Ms. Sestak?

MS. SESTAK: No objection, Your Honor.

JUDGE NENE: Nypaver B and C will be made part of the Record and I'll need another copy for the Court Reporter. Could I have those?

(Thereupon, the documents marked as

Nypaver Exhibits B and C were admitted into evidence).

THE WITNESS: Yes. I'll keep these.

JUDGE NENE: I don't think so.

THE WITNESS: All right.

JUDGE NENE: If you need to refer to them --

THE WITNESS: No, I see counsel has this.

JUDGE NENE: Ms. Dolores Nypaver, do you have any questions?

MS. NYPAVER: No, sir.

JUDGE NENE: Mr. Kalinski, do you have any questions for the --

MR. KALINSKI: Yes, I do.

JUDGE NENE: Slow down so the Court Reporter -- you have a tendency to speak fast.

MR. KALINSKI: I will do my best, Your Honor.

CROSS-EXAMINATION

BY MR. KALINSKI:

Q Mr. Zucconi, you mentioned in your testimony that the current line got some -- was experiencing some thermal problems?

A Thermal problems, I think it was approaching its rating, yes.

Q Does it mean this specific line reached the maximum of its current that you can transmit through it?

A That's correct. Based on our ratings, that's as much as it can carry.
Q Right. So you are building upgraded line in order to be able to transmit higher current; right?
A Actually, no. As you raise the voltage, the current goes down.
Q My question was, can you transmit higher load and higher current over the new line? You just mentioned 200 megavolts.
A Yes. That's the standard -- may I get up and talk towards my diagram?
JUDGE NENE: Yes.
A (Continuing) Most of our transmission lines, the ones part of our ring, are rated at 200 megawatts each.
Q Fine.
A I don't know what size wire our engineers are designing into this up here. But this substation will never carry more than 30 megawatts of loads. So the size wire they choose for this maybe smaller.
Q I see. Well, when you say in hypothetical situation, when you would look, okay, to transmit this 200 megawatts, can you make a calculation for us how many amps that would refer to? That should be simple, 200 divided by --
A Times the square root of three.
Q So you could make these calculations for us?

A 30 MVA is about 125 amps at 138 kV.
Q 125 amps. Thank you. In your view, this current upgrade of the existing line, is it going to last for the next one hundred years or the next ten years or 20 years, taking into account its function of the residential areas north of Pittsburgh?
A It will last as long as it takes for us to get 30 MVA at that substation. Once we have reached that point -- excuse me -- once we have reached that point, we will be looking for another source for load.
Q Right. What would be the next logical upgrade after 138 kilovolt?
A We don't plan to upgrade to any higher than 138 kV in this particular situation.
Q What are the existing possibilities of running even higher loads?
A The load cannot go any higher than 30 MVA because the substation, the transformer we are putting in there is a 30 MVA transformer. I go back to my testimony when I said what ANSI rates the equipment on, we can't put any more load than 30, we can accelerate the loss of its life. We wouldn't get economics.
JUDGE NENE: You speak very fast and you have an accent, so you must enunciate if you want this to be part of the Record.

MR. KALINSKI: I apologize for both.

BY MR. KALINSKI:

Q So may I ask whether is there a possibility in the future you will upgrade that transformer and you will be running higher powers through that substation?

A No.

Q And should -- does Duquesne Light -- can you guarantee it will never happen in the future?

A I'm not in a position to guarantee anything. I'm just saying that normal planning that we do, we do not foresee that substation being upgraded to anything more than a 30 MVA transformer. We presently have five or six or seven of these what we call compact substations on our system and the plan is to put in a 30 MVA transformer, run three circuits out of there and that's it.

Q Do you think that the current situation may reflect the situation in 1930 when you were negotiating the original right-of-way? The original line was 4 kilovolt and I suspect at that time point no one believed it would ever need to be upgraded to 23 kilovolts. People might have also not be expecting it needed to be upgraded to 138 kilovolts.

We are talking future, so for this reason I'm asking in hypothetical situation if 138 kilovolt will not be sufficient, what will be the next type of line that you would need to run?

A That's speculation and I don't know what that would be.

Q If, okay, you would have to further upgrade that line, would you still use the same route, Route E, and still if ever you would need to build towers for further upgrades, would you still run along the areas or would you need to change the routing?

JUDGE NENE: I'm sorry, I need --

MS. NYPAVER: Change the routing.

BY MR. KALINSKI:

Q In a theoretical situation, further upgrade to 400 kilovolt, would you still want to run it along the currently selected route, or you would then switch to another route?

A I don't know the requirements for right-of-way distance for higher voltage than 138 kV. That would have to come from one of our other engineers.

MR. KALINSKI: Thank you. Thank you, Your Honor.

JUDGE NENE: Thank you. Mr. Lapets, do you have any questions?

MR. LAPETS: No.

JUDGE NENE: Any Redirect?

MR. NYPAVER: Your Honor, I would like to ask one question.

JUDGE NENE: No.

MR. NYPAVER: Okay.

JUDGE NENE: You have Crossed and unless there's Redirect in the area that you're concerned with -- Ms. Sestak, any Redirect?

MS. SESTAK: No, Your Honor.

JUDGE NENE: Mr. Zucconi, thank you. Do you have another witness?

MS. SESTAK: Your Honor, I believe another --

JUDGE NENE: Off the Record a second.

(Discussion off the Record).

JUDGE NENE: I think we can proceed, Ms. Sestak.

MS. SESTAK: Thank you, Your Honor.

JUDGE NENE: We're back on the Record, but I want to indicate for the Record that Mr. Janosko is here. He's a protestant. We have indicated at the beginning that we're going to call all of those who are complaining about this project protestants, regardless of whether you have been nominated as a Complainant or not. You are a protestant for the sake of simplicity.

MR. JANOSKO: Okay.

JUDGE NENE: Your second witness, Ms. Sestak.

MS. SESTAK: Yes, Your Honor. I will not be calling the witnesses in the order in which they appear in the written testimony. I would next like to call Robert J.

Houston. His is Statement No. 5 in the written testimony.

JUDGE NENE: Mr. Houston, you have been sworn?

MR. HOUSTON: Yes, sir.

JUDGE NENE: Okay. Ms. Sestak.

ROBERT J. HOUSTON,

having been previously duly cautioned and sworn, testified as follows:

DIRECT EXAMINATION

BY MS. SESTAK:

Q Would you please state your name and spell your name for the benefit of the Record.

A Robert J. Houston, R-o-b-e-r-t, H-o-u-s-t-o-n.

Q And is it accurate to say, Mr. Houston, that you are with GAI, the consultant that prepared the study that questions have been already raised about in this proceeding?

A That's correct.

Q Now, I have identified your testimony as Statement No. 5 in Duquesne Light's written testimony. Did you personally participate in the preparation of that testimony?

A Yes, I did.

Q And is it true and accurate to the best of your knowledge?

A Yes, it is.

Q If you were to testify at length here today, would your testimony be substantially the same?

A Yes, it would.

Q And there are Exhibits to your written testimony that are identified in your written testimony. Those Exhibits are your background and education, which is RH 1, the original GAI study, which is RH 2, and this is the document that was also Exhibit 9 to both the amended application and the original application, and RH 3 is the Exhibit that is an addendum to the original GAI study that you prepared; is that correct?

A That is correct.

Q I would like to ask you a few questions based upon issues that arose in the public input hearings that were not directly addressed in your testimony.

Concerning the study that GAI performed, who picked the routes that GAI studied?

A The routes were selected by a group of professionals within GAI that worked directly for me, including a land use planner, an urban planner, environmental specialist, biologists, historians, archeologists, including our management staff who has a great deal of experience in siting and licensing transmission lines.

Q Does GAI site transmission lines for anyone other than Duquesne Light Company?

A Yes, we site transmission lines for utilities throughout the eastern part of the United States.

Q Have you ever performed any siting work or has GAI ever performed any work of this nature beyond the boundaries of the United States?

A Yes. Most recently we sited a transmission line in the Dominican Republic and also a transmission line in Honduras and El Salvador in Central America.

Q There was testimony at the public input hearing that in Third World countries transmission lines are always at least a hundred feet from dwelling units. Has that been your experience in your work with GAI in the Central American countries?

A No, it has not.

Q What has been your experience?

A Much of the transmission in especially the Dominican Republic, but also to a certain extent within Honduras and El Salvador, the infrastructure has been constructed to support a modern economy prior to the establishment of the urban areas and the development that had occurred within those areas.

So, the infrastructure came along after the areas were settled and developed that it was to support. So many of the transmission lines that we -- that I have sited in -- that had to go through urban areas, to serve urban areas, we routed along roadways because there was no way of finding adequate room to establish transmission right-of-way through

those areas.

Many of the transmission lines that are on the outskirts of these areas that have continued to develop, there are multiple encroachments. Many of these countries had national utilities and it was not politically feasible to eject squatters that have moved within many of these transmissions line rights-of-way, so there are one and two-story buildings underneath transmission lines all over the areas that I'm familiar with in Honduras, El Salvador and to a certain extent the Dominican Republic.

Q Thank you. In terms of specific testimony that was given at the public input hearings, Mr. Kalinski criticized the GAI study, in particular he criticized the assumption that there would be no significant environmental impact by using existing right-of-way.

Could you address that.

A Certainly. In our siting criteria, which are outlined in the report, the -- one of the first opportunities that we look for in siting transmission lines are existing electric utility corridors.

Secondarily, we look for transportation corridors such as highways and railroad corridors because there's already an impact there in terms of a linear facility that's in place.

Electric corridors are our first choice because

there's always an opportunity to either up rate the existing corridor, the lines within the existing corridor, or over build subtransmission, transmission and distribution lines within the same footprint.

So essentially what you would have would be a somewhat different design for the structure that holds the lines, either taller, as in this case, or if you have enough room within the right-of-way, you can use other types of structures.

But essentially, in the case of the study that's the subject here today, utilizing the same footprint in terms of a right-of-way that's owned by Duquesne Light or another right-of-way such as a railroad or highway right-of-way, it reduces the amount of vegetation that has to be trimmed, it reduces potential land use conflict -- which is one of the guidelines that the Public Utility Commission requires that we study.

It also reduces conflicts with all of the issues the Public Utility Commission wishes us to study, because essentially if you replace pole for pole within an existing footprint, then essentially the impact is nil because you have -- with the exception of perhaps some side trimming or some minor vegetation removal, you wouldn't be imposing a new land use or a new facility in areas where they currently do not exist.

Q When you say the criteria that the Public Utility Commission has established, are you talking about the criteria set forth in Regulation 57(e)?

A That's correct. That's the -- what you passed out this morning in terms of -- and those items are land use, soil and sedimentation, plant and wildlife habitats, terrain, hydrology, landscape, archeologic areas, geologic areas, historic areas, scenic areas, wilderness areas and scenic rivers.

Also, I might add that the Commission also requests that we identify all airports within two miles of a transmission line.

Q Need I ask why that is so?

A The airport?

Q Yes.

A Because transmission lines could potentially come in conflict with landing patterns at airports and cause some serious problems, so the Federal Aviation Administration also has interest in that as well.

Q Now, when Mr. Balik testified at the public input hearing he questioned the weighting criteria that had been established by GAI on a prior Duquesne Light project.

Could you explain a little bit about how that weighting impacted the present study and from your experience how that weighting is applicable?

A Okay. I take it you're referring to what we call the Siting Criteria Council weighting criteria that were actually established in the early '90s in the GPU DQE Transmission Line Project. That project, which evaluated over a thousand miles of alternative transmission line routes, was a project that had the financial horsepower to be able to assemble a fairly large group of people from across Western and Central Pennsylvania to be able to establish weighting criteria for the evaluation of the various alternative line routes.

Now, not prior to that, or since, has a project of that size presented itself to enable us to be able to reconvene that sort of a group of people. So, at this point in time, in terms of transmission lines within Pennsylvania, that's probably the best example of stakeholders across the area that would potentially be impacted coming together and establishing weighting criteria or weighting values for the various criteria that we utilize to evaluate the alternatives.

Now, we have used that, those weights, along with additional weights that have been established by our staff in some cases, to evaluate lines that we have routed since that point, all through 2the '90s, for not only Duquesne Light but also for General Public Utilities, Metropolitan Edison and Penelec. However, we do not look at -- use those

weights in any priority fashion without review.

We have our staff of urban planners, biologists, environmental specialists, engineers who specialize in construction and the issues of reliability, as well as historians and archeologists, review the weights that we propose to use from the GPU DQE Siting Criteria Council to make sure they are applicable, to make sense in terms of the connection that we're using them to evaluate current projects.

So, those folks, having a knowledge of the potential affects that the line might have and the character of the area that the line is traversing, would be able to judge and discuss within our group the applicability of the GPU DQE Council weights.

I think the second part of your question was in terms of applicability of those weights in terms of the context of where that line was located as opposed to the Wildwood line. Certainly in the Pittsburgh area when the GPU DQE line exited the Beaver Valley Station, and also in Harrisburg when it went into the transmission substation not too far from Three Mile Island -- which is what this power was supposed to replace -- there are very similar suburban communities through which those -- through which the GPU DQE line alternatives traversed.

So the Siting Criteria Council did have a vision of

the types of communities and areas that the -- that this line traverses. I think I answered your question.

Q I believe you did.

A Both parts.

Q Now, Mr. Buccilli, B-u-c-c-i-l-l-i, testified that in your study he believed that only five percent of the plan was environmentally studied. Is that an accurate statement?

A Five percent of the --

Q Of the Alternative E.

A Well, no. All of the alternatives were studied. I mean, the land use within and adjacent to each of the alternative corridors and the rights-of-way were analyzed, there was a compilation of all of the various criteria for each one of the alternatives made.

For those -- and that was used to judge whether or not all the assumptions that we were going to use in the evaluation process would, indeed, be correct.

I think what this five percent refers to is that the entire -- in the preferred alternative, which is Alternative E, the entire right is within the existing Duquesne Light right-of-way that is owned and maintained by Duquesne Light, so that the impacts to most of the resources that we would be using and most of the criteria we were using to evaluate the various alternatives in this particular case, there would be little or no impact from construction of -- the

replacement of the poles and the construction of a 138 kV line atop of the existing distribution system within the footprint of that existing right-of-way.

Q Thank you. Mr. Nypaver, during the public input hearing, questioned whether the snow trillium is rare or endangered in the State of Pennsylvania.

A The correspondence contained in our report, which comes directly from the Department of Conservation and Natural Resources here in Pennsylvania, indicates that it is an endangered status. That's -- and I understand that there was some information that said that there was a different status provided on the web site, but this is directly -- correspondence directly from the agency. Actually, endangered status is higher in terms of protection.

Now, this information was gathered as part of the siting process, so the Department of Conservation and Natural Resources provided us with location of known populations of trillium in the area and so in the siting of all the alternatives, we avoided those areas where that population might occur.

So, actually, the endangered status or any status of the trillium has become essentially irrelevant from the standpoint of the alternative because none of them would impact the plan.

Q Did Duquesne Light have any input in determining the

route or determining which of the routes -- how the routes came out in the final rating in terms of your ranking of the routes?

A No. We were charged with connecting the Wildwood Substation to a series -- to any one of a number of taps on the -- on an existing 138 kV line in the southern portion of the study area. In my testimony I describe how that study area was established and then it was GAI staff that actually went about siting the alternatives within that study area.

We did, from time to time, request additional data from Duquesne Light in terms of the status of the right-of-way where we found existing utility rights-of-way in terms of the rights that Duquesne Light might have in terms of constructing within those rights-of-way.

Q Thank you. At the public input hearing Mr. Moorehead opined that the addendum to the GAI study, that is your Exhibit RH 3, undercounts the numbers of homes along the lines.

Is that an accurate statement?

A I believe not. We went through a two phase process to establish the number of dwelling units. I use the term dwelling units because there are in several cases multi-family, either apartment buildings or condominiums within a hundred feet of the various alternatives.

We first took recent area photography and identified

all the structures within a hundred feet of the center line of each of the alternatives and then went out in the field along those alternatives and identified whether or not they were housing units and if they were multiple housing units, we identified the number of units within each of the buildings.

If a building was within a hundred feet, but not all of the building within a hundred feet that had multiple units, we counted all the units so that we would not undercount on the basis of trying to slice it through a building that might be -- where part of it might be outside of that hundred foot.

So all of these data were identified on aerial photography and then verified in the field.

Q Okay. Would you consider Route E, the route that was ultimately chosen by Duquesne Light, to be densely populated?

A From the standpoint of the North Hills of Pittsburgh and the Pittsburgh region, it runs through typical suburban residential neighborhoods. I would consider densely populated to be closer to the neighborhood within the city where the lot sizes are perhaps 40 foot -- actually, there are lot sizes within the city that are anywhere from 15 feet to 40 some feet and some larger, of course, but areas that are densely populated are those areas where there is very

little distance between homes and the number of people per acre is much higher than what we would normally find within the communities in the North Hills where the lines traverse.

Q In the original GAI study, which of the line selections ranked most suitable?

A That's identified in both our report, most recently in the addendum report. Line E was identified as being most suitable because it had the best score from the environmental standpoint. In my Exhibit RH 2, in my testimony, which is the addendum report, there's a table at the end of the report that shows the -- at the very end of the report that shows the ranking of the alternatives without using the residential unit count, which was the subject of the addendum which is called the May, 2004, Report and then the October, 2005, Report, which counts all of the residential dwelling units within a hundred feet of the center line of each of the alternatives.

Alternative E comes out No. 1 in both of those and we identify them as being -- identified Alternative E as being the most suitable. However, in both -- in all cases we identified Route A as a suitable route, Route C as a suitable route and Route E-1 as also being suitable for construction.

So, there are four routes that we feel, from an environmental standpoint, would be acceptable if Duquesne

Light were to select any one of them on the basis of environmental impact.

MR. JANOSKO: Would you repeat those routes again, please, accepted alternatives?

THE WITNESS: E, of course, was what we call the preferred route or most suitable, also E-1, C and A, are identified as being suitable routes in both the original report and also the addendum.

BY MS. SESTAK:

Q In terms of the routes, there is a large document hanging at the front of the room that shows the various routes in color. Is this document substantially identical to the Figure 3-2 of the original GAI report?

A Yes, it is.

Q A little bit bigger and a little more emphasized?

A That's correct.

Q Thank you. Finally, did GAI prepare mock-ups of what the poles might look like after conversion to the 138 kV line?

A Yes, we did.

Q I'm going to show you two documents --

MS. SESTAK: Actually, these are just possible appearances that I don't intend to offer into evidence.

JUDGE NENE: You can set them up here maybe.

MS. SESTAK: They are for informational

purposes. Actually, there's two copies of each and I don't think we need the second copy, unless we put them on the bench over here.

THE WITNESS: I think these are before and after, they're not quite in the right order.

MS. SESTAK: I apologize. These are before and after. Okay. Then maybe I should let you set them up.

MR. SCHMITT: They're all after.

THE WITNESS: Are these all after? No, this is not.

MR. SCHMITT: Those are repeats?

THE WITNESS: Are they all the same?

MS. SESTAK: No, there are two copies of each and these are the afters.

THE WITNESS: Okay. I'm sorry. I could not see the insulator arms on this.

A (Continuing) Those are what we call visualizations which show what the visual affect or the -- what the structures on which the 138 kV line would look like after its in place. We have before and after photographs on the web site, public information web site where anybody that wants to can go in and take a look at what this area will look like prior to the installation, at the present time and what it will look like after the line is in -- is constructed and in place.

JUDGE NENE: This is not a photograph, this is a creation, a computer creation?

THE WITNESS: This is a photograph, but there is a computer -- there's an existing structure at this particular point presently and what we have done is we have removed that pole and we have put in a pole that would represent what's going to be constructed or what's proposed to be constructed.

JUDGE NENE: It is an electronic enhancement?

THE WITNESS: Yes.

JUDGE NENE: This doesn't actually exist anywhere?

THE WITNESS: That is correct.

JUDGE NENE: This is the -- looking at the Ringeisen, north end, the poles on the right side of the highway, is that how they occur -- how they currently exist?

THE WITNESS: These poles right here?

JUDGE NENE: Yes.

THE WITNESS: Yes, Your Honor. That's correct.

JUDGE NENE: The ones on the left is how you envision, electronically, completion of this project would look?

THE WITNESS: That is correct. And this is where the existing transmission and subtransmission system

is currently located.

So what Duquesne Light proposes to do is replace pole for pole along the street.

JUDGE NENE: Thank you. Do you have any further questions?

MS. SESTAK: I have no further questions.

JUDGE NENE: Did you want to move any of these documents into the Record?

MS. SESTAK: Your Honor, I move Mr. Houston's testimony and his Exhibits into the Record.

JUDGE NENE: You identified three exhibits. I want to make sure we have them all. You had RH1, RH2 and RH3?

MS. SESTAK: Yes.

JUDGE NENE: Does that include these exhibits that he just referred to the Tables A, 1 and et cetera?

MS. SESTAK: Those are all attached to those Exhibits, yes.

JUDGE NENE: Are you moving these large photographs into the Record?

MS. SESTAK: No, Your Honor, those are meant primarily for illustrative purposes.

JUDGE NENE: Its been very helpful. Before we cross-examine, I want to ask you a question about your testimony, Mr. Houston.

You said that on occasion -- I'm just curious about how independent your study was -- GAI was contracted to analyze and make a recommendation.

THE WITNESS: That is correct, Your Honor.

JUDGE NENE: You said -- I'm just concerned about the independence. You said on occasion you went back to Duquesne Light and discussed right-of-way situations to help you in your decision.

Did those discussions involve the costs of acquiring or the savings in not acquiring rights-of-way?

THE WITNESS: No, Your Honor. Essentially what we requested from Duquesne Light were copies or examples of the right-of-way agreements that occurred along the various routes so that we knew the overall width or the -- any restrictions that might be within those existing right-of-way agreements.

So, I called the project engineer at Duquesne Light, who is Tom Schmitt or somebody, on my staff -- or on the staff at GAI called on occasion to request right-of-way information.

JUDGE NENE: Was one of the factors that was involved in making this recommendation, did it concern the costs of construction and the costs of future maintenance of the line?

THE WITNESS: Not really, Your Honor, no.

Now, our engineers -- we had engineers on our staff that looked at constructability issues in terms of what type of disruption might occur within the community should an alternative be selected and constructed and also in working with those -- with the engineers, our land use planners and environmental specialists, we discussed amongst ourself when we were looking at the various routes what types of construction techniques would be appropriate and how disruptive those particular types of construction techniques might be, how much -- in the case of new right-of-way -- how much area would have to be cleared that currently is in forrest or residential back yard use and that sort of thing.

JUDGE NENE: Was that information then considered in making the recommendation?

THE WITNESS: Yes, it was.

JUDGE NENE: Was the cost of the various projects a factor?

THE WITNESS: We had the overall assumption, without any direct interrelation with Duquesne, my assumption and the assumption of my staff in terms of our routing was the longer the line the more expensive it would be because it would require more equipment in terms of poles and cable and that sort of thing.

Routes E, by the way, is the longest of the routes.

JUDGE NENE: I was going to say that.

THE WITNESS: But that did not become a factor in terms of our evaluation of various alternatives in terms of what the costs might be.

As a matter of fact, we had no indication of what the total costs might be until Duquesne Light asked us recently to provide that or requested a cost estimate for each of the alternatives.

JUDGE NENE: Before I open the witness to Cross-Examination, I don't think I said that the testimony and the Exhibits that you identified will be made part of the Record.

MS. SESTAK: Thank you.

JUDGE NENE: They are admitted. Mr. Nypaver, do you have any questions of Mr. Houston?

(Thereupon, the documents were marked as Exhibit RH1, RH2 and RH3 for identification and were admitted into evidence).

MR. NYPAVER: Yes, I do, Your Honor.

CROSS-EXAMINATION

BY MR. NYPAVER:

Q Actually, let's start out with the last exhibit. You showed two Exhibits from Ringeisen. Why did you not have a picture from the same end?

A I don't understand your question.

Q Pictures are deceiving. You shot one way, you get something, you shot another way you get a another.

If I'm shooting at shade and if I put another pole, I don't see the visual affect, I don't know how high its going to be compared to the house or what it is going to be in that picture where you are shooting the picture.

The other aspects of this line here is that you have pine trees on the one side and you can see the line goes straight down the road. Are those pine trees going to be there and are the trees in the back going to be gone because of the clearance?

You're just showing a pole on an area and you're shooting two different angles, not the same angle.

A These are not the same poles. This is not a before and after.

Q Even if it was or wasn't, why didn't you show the enhancement on that graphic over there?

A Well, we did. That's why I guess its really good because you can't tell. This is the new line in front of this house. This is the 138 -- these are the three 138 kV circuits right here.

JUDGE NENE: As conceived? Its not in reality?

THE WITNESS: That's correct, Your Honor. This is just -- this is a -- Duquesne Light's existing

utility pole here, that probably comes up to about here, there is -- the additional height of the new utility pole will contain the three 138 kV circuits.

JUDGE NENE: There's no way of showing your surprise on the Record, but it will be noted.

MR. NYPAVER: Okay. I was not aware that that was the case there, because I don't have a before picture, so I'm just assuming that was a before and after.

THE WITNESS: I wish we had the before pictures. They are on the web site. I don't know if you visited the public information web site, but before and after is on there.

BY MR. NYPAVER:

Q But in this picture here, you don't show the trees being cleared out along the line behind?

A And I'm not going to address vegetation maintenance, somebody here will do that.

Q I'm just saying the visual impact.

A But there will be an opportunity for vegetation to occur adjacent to the line as long as it, you know, it doesn't interfere with the -- in terms of reliability, because in some cases there are low growing trees. If those trees continue to grow and become a problem in terms of coming too close in contact with the conductors, then that might have to be trimmed.

Q Okay.
A There will be somebody who will be able to address that.
Q This is just visualization with respect to everything, so -- you mentioned on the GPU study -- GPU Duquesne Light study was it 500 --
A 500 kV line.
Q You mentioned the fact that its a suburban area, you also mentioned the fact that the line travels a thousand miles.
A The various alternatives did, yes.
Q I mean, in relationship to mileage in rural areas like, I guess, outside the main suburbs of Pittsburgh and Harrisburg, you're mostly in rural areas and you show that on that study that you gave a weighting system of, I think its 88.8 for the residential -- I mean, for commercial and -- let me find the sheet here -- let me jump to another question while I work on that.

JUDGE NENE: You don't have to talk all the time. You can --

MR. NYPAVER: Now, I opened it up to the right page.

BY MR. NYPAVER:
Q You're saying in the commercial area on this big route, this thousand route -- thousand mile routes you have

commercial density populous of 88.8, but in residential you have 76.9, so that means you're putting more emphasis on commercial and densely populated areas and here its just the opposite, we're more of a -- you know, its the -- more of a residential area because you're more in the city on this line.

What -- is there a justification for that?

A I don't understand your question.

MR. NYPAVER: May I get a drink, Your Honor?

JUDGE NENE: Yes. Sure.

MR. NYPAVER: I always hate going first, too.

JUDGE NENE: You sat in the front row.

MR. NYPAVER: I was the first one here, too, and I didn't want to be. I'm trying to get my stuff together.

JUDGE NENE: That mumbling doesn't have to be part of the Record.

MR. NYPAVER: Okay.

BY MR. NYPAVER:

Q Basically the -- you're saying that the adjacent areas, commercial -- densely populated commercial areas with a score of 88.8 and then a mile of residential area will have a score of 76.9. Lower scores imply less of an impact, high voltage right-of-way is more variable in an industrial commercial area than it is in a residential area. That's

counter intuitive from what normally would be expected from people in this area, the stakeholders.

How do you -- what do you think the residents would feel about that?

A Well, let me -- I'm still not exactly -- I think I know what your question is, so let me try to address it.

You're talking about social and community impacts and we have several different categories that we use to evaluate potential affects of transmission lines traversing communities. The Siting Criteria Council and our review of their weighting system, they designated commercial densely populated areas as having a weight of 88.8 and I think I testified earlier that commercially populated areas would be something like the Bloomfield section of Pittsburgh where you have got probably four times as many people per acre than you do in McCandless and Hampton or more, with a lot of commercial structures as well as housing units.

The Siting Criteria Council gave a weight of 76.9 to residential areas, which are essentially viewed as being similar to what we're traversing in the Wildwood case, where you have got -- where you essentially have a suburban community residential area.

Other community infrastructure or community impacts that were considered were highway and railroad crossings which received a weight of 33.1, institutional complexes,

which are such things as schools and hospitals and other public buildings where the public's business is conducted were given a rating of 83.1, which is the second highest of all the ratings. Urban densely populated 88.8 being the highest.

So, the residential areas received the third highest rating of any of the criteria -- I'm sorry, the fourth highest, non-existing right-of-way, and this is important to remember -- and it goes back to the point that I made during my earlier testimony -- the Siting Criteria Council -- and certainly all of us who site transmission lines -- consider non-existing -- the use of non-existing right-of-way, in other words, the acquisition, the clearing and the construction on new right-of-way and changing and converting the land use on that right-of-way to be a fairly serious affect and the Siting Criteria Council agreed with us by giving it the third highest rating and then residential areas received the fourth highest rating.

So of all the natural, historic, cultural features that are evaluated, residential areas received the fourth highest, only behind densely populated urban areas, institutional complexes such as hospitals and schools and right-of-way -- transmission line on non-existent right-of-way.

I think that's what you were asking me.

Q Well, what I was really saying is why -- its counter intuitive because you would think -- one would expect the -- its counter intuitive from what one would expect from the stakeholder developing in the residential area, but you had mentioned the commercial areas and I would like to go back to my two Exhibits, B and C, that I had submitted already --

MR. NYPAVER: I'm trying to find the two Exhibits that I gave out, Your Honor. I don't know if I gave my copy out.

JUDGE NENE: That's okay. Take your time. I think while you look for it --

MR. NYPAVER: I just didn't have them marked.

JUDGE NENE: Mark them, please, so when you do refer to them we can know what you are looking at.

BY MR. NYPAVER:

Q On the Route A corridor, Exhibit B, is my aerial view of the substation and the substation is in the upper left-hand corner, just adjacent to the long narrow building. That's actually at the lower tip of the long narrow building. This is the substation right there.

MR. NYPAVER: Right here, Your Honor.

JUDGE NENE: I see it.

Q (Continuing) If you look at that area, that is one of the areas you considered commercial, highly commercial, densely populated, because when I look at the Route A

corridor, there are two new sections of right-of-way, otherwise its all existing and non-public right-of-way.

Can you tell me -- and if you look at Exhibit C, you can see the substation and then the view from West Hardies Road.

JUDGE NENE: We don't know -- I don't know where West Hardies Road is.

MR. NYPAVER: Here's another Exhibit here.

JUDGE NENE: If its relevant.

MR. NYPAVER: I actually do have another one. I'll mark it Exhibit D, if you want me to.

(Thereupon, the document was marked as Nypaver Exhibit D for identification).

JUDGE NENE: Ms. Sestak, I have invited another Exhibit. Do you have any objection to that?

MS. SESTAK: I don't know what it is yet.

MR. NYPAVER: Its the same subsection except its blown out a hundred yards. You get two, Your Honor.

JUDGE NENE: I'm going to need three.

MS. SESTAK: No objection, Your Honor.

JUDGE NENE: Okay.

(Thereupon, the document marked as Nypaver Exhibit D was admitted into evidence).

BY MR. NYPAVER:

Q So West Hardies Road is just onto the right of the substation. Route A says that they need a thousand feet of new right-of-way when they meet the substation. Exhibit C shows that there's a line going from the substation to a pole behind the fixture and then the bottom portion is the line coming across over to West Hardies Road. It goes from West Hardies Road down to Wildwood Road and then connects to where Route A is terminated.

So, my question to Mr. Houston is why is -- why did you not use the existing right-of-way in this area?

A You mean for the -- for which route, which alternative?

Q This is Route A.

A Well, let me look at the description of Route A versus land use in the report, which is Exhibit RH 2. Well its because the existing line out of Wildwood goes west and in order to get to Route 8 and along Wildwood Road, you have to go west.

Q This line here -- and then you're basically saying you are coming out of the substation, coming down here and coming out there, way out, off Wildwood Road?

A Well, its Duquesne Light property, so the -- and since they don't have to purchase right-of-way, the shortest distance between two points is a straight line and if we

wanted to get down onto Wildwood Road and rather than coming out and having to go through additional private property to get down to Wildwood Road to use the existing subtransmission distribution and highway right-of-way, the quickest way to get there is to go straight down.

Q When you're saying go straight down, you're saying come across right --

JUDGE NENE: You're going much too fast.

MR. NYPAVER: I'm getting like him.

BY MR. NYPAVER:

Q You come out of the substation, you go across Wildwood Road, then you go across the railroad tracks to Sample/West Hardies intersection and tie into an existing tap or existing line right here on Wildwood Road, that is considered -- that is considered all new right-of-way on the Route A selection, but there is already an existing line that leaves the substation, comes through this area here to West Hardies Road, drops down to West Hardies Road and Wildwood Road and actually ties into this line on Wildwood Road.

So my question is, why have you not used existing right-of-way?

A I would have to go out and take a look at that. It appears to me as though there's quite a bit of development within that right-of-way if it comes straight across here.

Q Exhibit C shows a picture of this.

A I would have to go take a look. Unfortunately, there is a several square mile study area, so I can't tell you in every case why we didn't go where we didn't go and I can tell you why we are where we are. It could be there is some resource in there. I would have to look at the mapping and have further discussion.

I can't recall why, but certainly this is within the thousand foot corridor that we're asking the Commission to approve, which is normally the case, and if there are better routes within that thousand foot corridor that get approved by the Commission, ones that would be more feasible, then certainly Duquesne, I'm sure, would take a look at it.

Q The areas you see there, how would you describe that area? The area really around Wildwood Road, which is the road that's not marked from an aerial view.

A Well, there's some sort of industrial -- it looks like some sort of industrial complex right here. I can't recall what that is. I have been in the area, but -- but I would call it mixed urban residential and then there is also some forest land adjacent.

Q Okay.

MR. NYPAVER: I believe the study actually called that densely populated commercial, so I just wanted to bring that up, Your Honor.

MS. SESTAK: Objection, Your Honor. Mr. Nypaver is repeatedly referring to the study, which everyone can see is approximately an inch-and-a-half thick if not thicker. I ask that if Mr. Nypaver refers to the study in a question to this witness or any other witness he delineate which page or which figure he's referring to.

MR. NYPAVER: Okay.

JUDGE NENE: I think that's reasonable.

MR. NYPAVER: Okay. It's actually Table 3 -- 3-1, I believe it is. 3-1 or 3-2. Its 3-1, Your Honor.

BY MR. NYPAVER:

Q The reference to the selection route is --

JUDGE NENE: Don't mumble.

Q -- Page 1-6 describes it. I'm looking for one that's a little more detailed. Page 2-3 is the more detailed version of that where it says 2.1.1.1.

A Well, I think you're confusing some wording in the -- on page 2-3 with the evaluation criteria. Now, I would have to take a look at our raw data, but I do not believe that we evaluated this as being -- this area as being what we call a commercial densely populated area. We just stated the fact that it goes through urban development or developed areas, which is, you know, an industrial operation and electric -- certainly a substation area and as well as some -- it looks like -- I'm not sure what this is right here. It looks like

it would be a car dealer -- not a dealership, a repair shop or something, and then there's the old mining buildings there in that area as well that's now a recreation area.

But certainly the wording here does not indicate that its going through a densely populated urban area. I think you misconstrued from the way its worded and perhaps it could be worded better.

Q It's actually because of the rating system on Table 3-1.

A Yes, on Table 3-1, but on Table 3-1 it doesn't tell you any specific location. As stated in my report and testimony, the raw data is on file at GAI and I can certainly identify that and get that information -- its all on GIS -- on a point by point basis, on running feet or on mileage and so forth, what we consider to be the particular type of land use that the project traverses.

But I think you're trying to over interpret and perhaps misconstruing a generalized description of the line versus what's on the tables in the back.

JUDGE NENE: Okay. I think we have exhausted that subject.

MR. NYPAVER: Okay. Now, Your Honor, opposite on Route 8 there is the same scenario. I don't know if you wanted to go through that, but I do have some Exhibits.

JUDGE NENE: You have not had enough Exhibits

and I need Exhibit D and if you're going to produce more, we have to have sufficient copies. Its going to get out of control.

MR. NYPAVER: I didn't know what the order of the testimony was, Your Honor, or I would have probably marked them.

JUDGE NENE: We have been going for an hour and 45 minutes, especially the Court Reporter who has been taking this all down, so we're going to recess. Actually, it's a quarter to 12 by my clock, I can't believe that already, but we might as well recess for lunch, get an early lunch and come back at 1:00 o'clock.

We'll be in recess until 1:00 o'clock and we will continue with your Cross-Examination at that time.

MR. NYPAVER: Thank you.

MS. SESTAK: Thank you.

(Thereupon, a luncheon recess was taken).

AFTERNOON SESSION

JUDGE NENE: Its 1:00 o'clock. We're back on the Record and we will continue with Mr. Nypaver's Cross-Examination of Mr. Houston.

MR. BALIK: Your Honor, when can I give my formal protest respectfully?

JUDGE NENE: Are you in a hurry to leave?

MR. BALIK: No, sir. No, Your Honor. I'm

staying for the rest of the afternoon.

JUDGE NENE: Draw it to my attention later, will you.

MR. BALIK: All right.

JUDGE NENE: That was an inquiry from Mr. Balik, B-a-l-i-k. Mr. Balik, you might as well make a statement now. Go ahead.

MR. BALIK: I would just like to go on Record as indicating that I was a Complainant last year in a complaint that was filed under this docket and at Bruce Krist et al. There were an additional 200 names filed under that. I do understand its difficult, if not impossible, to have all 200 people attend and speak, but the homeowners had asked me to speak because I had the technical background and the preparation today was centered around that plan and I just want to be on Record that I'm protesting not being able to speak and actually, Your Honor, it might go a lot easier on all of us if I were able to speak, but that's all I have to say.

JUDGE NENE: I'm just saying you have spoken on two occasions at the public input hearings, so we have your testimony as a matter of Record.

MR. BALIK: Yes. But I didn't get a chance to cross-examine any of the evidence presented by Duquesne Light.

JUDGE NENE: That's right; but do you understand what this process would be like if we had the 250 people here cross-examining these witnesses?

MR. BALIK: I understand, Your Honor, but Bruce Krist et al didn't ask for 200 people. They asked for one person, for me to speak.

JUDGE NENE: Well, you have spoken twice and we have -- you have expressed your concerns. We'll resume now with Mr. Nypaver's Cross-Examination.

BY MR. NYPAVER:

Q I think I believe I left off on discussing the new right-of-way from -- existing right-of-way from the substation over to West Hardies Road and that was, I think, the last point that was brought up.

I would like to bring up an item on page XIII or 13, XIII -- actually, its 12 and 13 in this document. You said that -- it is page 13, XIII, looking at Route C, you said it is -- has the lowest impact on commercial and densely populated areas and avoids residential areas and as to the visual impacts which are considered lowest, shielded from most of its view. Is that not true?

A That's what it says, yes.

Q Okay. One of the -- so that would -- let me see here. The page 2.2 -- that would be pointed on that one there -- you had talked about land use and in the breakdown

of land use, can you read the very first couple items on land use, underneath the Anderson Level II process.

A You mean you want me to give you the categories?

Q Yes.

A Residential lands, deciduous forests, croplands/pasture, mixed forests, orchards/vineyards, herbaceous rangeland, shrub-brush rangeland, mixed rangeland, urban lands in commercial and industrial lands, evergreen forests, palustrine emergent wetlands, palestine, p-a-l-u-s-t-r-i-n-e, scrub-shrub wetlands, palustrine forested wetlands, streams and lakes/ponds and reservoirs.

Q Now, the very first item is residential lands; is that not true?

A That's correct.

Q Okay. Can you tell me why in the studies that you have done that you have eliminated all but -- or most of the residential lands in the study?

A I think I made it very clear in my initial Cross that we did not eliminate residential lands, that they were certainly considered and every land use that every one of the alternatives traversed was considered and looked at from a -- from the standpoint of what the potential impacts that alternative might have on that land.

I think what you're referring to is the fact that a lot of the residential land, if not all of it, on

Alternative E is not given a score because, as I mentioned previously as well, Alternative E is completely within the footprint of an existing Duquesne Light right-of-way, which means that it is not currently in conflict with the land use, either beneath the line within that footprint or adjacent. Its used for electric transmission purposes. In many cases the area that grew up around it and the development that grew around that line developed with the transmission line or subtransmission line, the electric corridor, already in place.

In those areas where new right-of-way is required through residential lands, that was considered. The addendum, which is my Exhibit RJH 3, concerns a consideration of all of the alternatives in relation to residential land because we counted the number of occupied units within a hundred feet of each of the alternative rights-of-way and scored it and so, indeed, an entire separate category called residential dwellings within a hundred feet of the center line of the alternatives is considered.

So, residential lands -- in response to meetings that we had in both McCandless and Hampton Townships, GAI and Duquesne Light decided that it would be appropriate to conduct further analysis to address the concerns that residents had that residential land and residential

dwellings weren't given a high enough priority.

Q Okay. Now you said -- you were saying that of an existing right-of-way, but here again its existing right-of-way for a 23,000 volt kV line, which is a subtransmission volt level. Now you're increasing it to 138 kV line and it does not seem to justify that you can say that its the same impact or it has no impact at all.

As far as, you know, impact -- I mean, there have been impacts with -- from the public hearings you heard different stories from different people -- I don't know if you were with Duquesne Light, or not, in -- as a matter of fact --

A Is this a question?

Q No. No. Sorry.

A I'm afraid I can't respond.

Q But I guess the thing is how can you say there is no impact on a residential area because its a right-of-way and its a right-of-way for a subtransmission voltage line versus a high voltage transmission line?

A How can I say that there's not an impact on a residential area? I think I made myself clear, its the opinion of the experts that I have assembled to consider the various routes and the evaluation of the routes, including the urban planners within our group, that an existing transmission line right-of-way or subtransmission line

right-of-way where you replace pole for pole with taller poles and string a 138 kV -- three 138 kV transmission cables on those poles within the same footprint does not significantly impact the area within that right-of-way or adjacent to it. You're using that area for exactly the same purpose that its currently being used.

I also emphasized the fact that when we put a 138 kV transmission line on new right-of-way where property would have to be -- where right-of-way options would have to be -- and rights would have to be obtained, you would be changing the land use, the current property owner -- for which the current property owner uses that land.

In this particular case, we're not changing land use, we're not having significant impacts on any type of natural system, wetlands, streams --

Q We're taking residential here and you know everyone is a homeowner and they have -- everybody has what they consider like their own quality of life symbols, whether it be privacy, whether it be sound barrier, whether it be esthetics, whether it be, you know, just the surroundings itself, just the location and how can you say there's not going to be any impact on residents there?

A I'm telling you that we're going to have a transmission line in that corridor replacing pole for pole with taller poles.

JUDGE NENE: I think you have answered that question.

MR. NYPAVER: All right. No more further questions, Your Honor, at this time.

JUDGE NENE: Mrs. Nypaver, do you have any questions.

MS. NYPAVER: Could I step up to the pictures, please?

JUDGE NENE: Yes.

MS. NYPAVER: I have a question about the picture.

CROSS-EXAMINATION

BY MS. NYPAVER:

Q Is it true -- I think I heard this from the attorney -- that this was before and after pictures or -- its not? Before a high voltage pole and after?

JUDGE NENE: I believe the witness testified about the pictures.

A These pictures are after.

Q After changing a low voltage 23 kV to a high voltage 43 K; is that right?

A No. This is what it will look like after the 138 kV transmission line is constructed and the --

Q Could you --

JUDGE NENE: Wait.

A The 138 kV transmission line is overbuilding the 23 kV lines where appropriate. Some of the 23 kv lines -- the engineers are going to have to tell you specifically -- but some of the 23 kV lines will be eliminated. This is replacing a 23 kV circuit.

Q So this is which one?

A This is the 138.

Q 138, which is what you would increase it to?

A That's what Duquesne Light wants to do, replace the 23 with the 138, yes.

Q Okay. Could you tell me, please, what the size of the lower voltage pole would look like?

A I do not understand your question.

Q How big would it be?

A You mean the current pole?

Q Yes, sir.

A Its what you see out there now.

Q This is the current pole that's there now?

A No, that's the new pole.

Q That's what I'm asking, what the old one -- would it be this size?

A I think it would be more appropriate to ask the engineer when he comes -- when he speaks because he can tell you the exact specifications of what's out there right now.

MS. NYPAVER: Would you like me to hold my

question?

JUDGE NENE: Yes.

MS. NYPAVER: Okay. Thank you. I have no further questions.

JUDGE NENE: Thank you. Mr. Kalinski.

CROSS-EXAMINATION

BY MR. KALINSKI:

Q May I ask whether GAI ran any previous evaluations for Duquesne Light?

A You mean have we done other projects for Duquesne Light?

Q Right.

A Yes, we have.

Q Do you expect that you will be performing future evaluations for them?

A I hope so.

Q Do you think that the outcome of this hearing will affect your ability to perform evaluations for them or do you think that in the case of a negative outcome they may decide to go with another company?

A Well, I can't predict what Duquesne Light might do, might or might not do. Depending upon the outcome of this hearing or any of the other work we have done for them.

Q Have you recently performed many evaluations of other 138 kV lines in the area?

A Yes, we have.

Q Have you performed any evaluations of 4 kV or 23 kV impact?

A Generally 4 kV and 23 kV lines are not a matter of siting before the Commission, so very seldom are consultants hired by the utilities to site those lines.

Q Can you tell us what is the difference, why you don't do -- why you are not required to run evaluations of 23 kV lines or 4 kV lines but you do -- but you are expected to evaluation potential environmental impact on 138 kV?

A I can't tell you this because I was not in the minds of the Commission or any Legislative action that was -- that required the Commission to formulate siting guidelines, but I'll tell you its not the same in every state.

In the State of Pennsylvania its 100 kilovolt and above require sitting. In the state of Virginia its 150. So we have done some 138 kV design work in Virginia with State Corporation, which is their PUC oversight.

So its the matter of the desire of the particular Commission to control the siting and the licensing and whether or not it goes on the rate base in terms of picking a number and I don't know what factors were involved in the Pennsylvania Public Utility Commission picking a hundred kilovolt.

Q I understand. I'm trying to follow-up on your

argument that on the existing kilovolt, 23 kV lines, there is no making additional environmental impact at the same time you're telling me for some reason the State of Pennsylvania requires environmental evaluation of 138 kV lines but not 24 -- 23 kV lines and not 4 kV lines. I don't understand how in the situation you may conclude there is no difference between 138 kV line and 24 kV lines.

Using this logic, I think one could argue that I could run high voltage line through downtown Pittsburgh or Shadyside, first building 4 kV line which wouldn't require any environmental impact and once you would have right-of-way, you could just say, well, okay, let's build, okay, something which crosses 138 kV lines.

I don't understand how in one sentence you may argue that, well, you don't need any analysis of environmental impact on low voltage lines, but you do require it for 138 kV lines and at the same time in your analysis, you are not taking into account the 85 percent of the length of the Route E because its already right-of-way. However, its never been evaluated.

JUDGE NENE: Mr. Kalinski, could you ask a question, please.

MR. KALINSKI: Okay.

BY MR. KALINSKI:

Q Do you believe that the State of Pennsylvania doesn't

see the difference between actually 138 kv line and 23 kV line with regard to environmental impact?

A I can't speak for the State of Pennsylvania. I know what the regulations are and I don't -- and as I mentioned, I'm not -- I was not privy to the discussions that were held and the decisions that were made by the Commission to cutoff the siting guidelines and the siting certification at 100 kV.

I can tell you that my firm is working on the design right now for Duquesne Light of putting a 345 kV line through the streets of Pittsburgh and without Commission oversight because its not an overhead transmission line it is an underground transmission line.

I would take it that the Utility Commission took it upon itself in perhaps promulgating these regulations because the utilities were having a more difficult time with the permitting agencies and with the PUC serving as an umbrella organization, its much easier now to deal with the permit and resource agencies in terms of overhead transmission lines.

Q May I ask whether this still -- that you refer to that you do not consider any environmental impact along the part of that underground transmission line wherever its existing -- are you using the same type of analysis also in the analysis of environmental impact; do you exclude the

parts of this 345 kV line which are running along the existing right-of-way?

A Well, as I mentioned, the 345 kV line that's currently -- its under construction or about to become under construction from Duquesne Light's Arsenal Substation to the Highland Substation is underground, it does not have Public Utility Commission oversight. The oversight is building permits on the part of the City of Pittsburgh.

Q Okay. Can you tell us with regard to the criteria that you used to compare environmental impacts of different routes where do they come from? For example, taking into analysis hundred feet distance, are they general rules of the state or are they general rules which are federal?

How have you selected the weighing ratios and the criteria that you took into account in your analysis?

A Okay. I think that question was asked earlier this morning.

The criteria -- most of the evaluation criteria come directly from the Public Utility Commission regulations and I went through that list of land use, soil, sedimentation, wildlife, resources and so forth. There's a complete list in the Record.

Where the weights came from I also answered that question earlier and they came from a Siting Criteria Council that was assembled for the GPU DQE line in the early

'90s.

Q My last question is, well, you were asked by Ms. Sestak to specify whether you consider current routing of Route E to be running through densely populated areas. If I remember correct, you said the answer is no, you believe its a typical suburban neighborhood not densely populated area. Can I ask the same question without rephrasing it, do you consider current routing to run through more densely populated areas than such areas as Route 8 or the existing route?

A I think that answer is contained in the addendum report where I provided the number of houses past which each of the alternatives traverse and E is the one that has the highest number of houses and its a function not only of the neighborhoods but also the distance. Its the longest of the lines and thus it passes the most dwelling units within the existing right-of-way.

Q Can you specify what is the number of houses in the direct vicinity?

A Certainly. That number is contained in my addendum report, which is Exhibit RH 3, and its contained in Table A-1 -- wait, I'm sorry.

MR. JANOSKO: Its in 1. Second page of A-1.

THE WITNESS: There we go. You're right.

A (Continuing) 116 houses, is the answer to your

question.

Q How does it compare to the number of houses along Route C?

A Route C has 11.

Q So its a difference of about 15 fold?

A That's correct.

MR. KALINSKI: Thank you. Thank you, Your Honor.

JUDGE NENE: Mr. Lapets.

MR. LAPETS: Yes, I have a question.

CROSS-EXAMINATION

BY MR. LAPETS:

Q There is an elementary public school within a thousand feet of the Route E. Why it was not included into the study?

A Because we did not consider institutional complexes within a thousand feet. That's too far away to have an impact either visually or any other way.

Q That's a good answer. Have you examined the validity of existing rights-of-way, many of which were obtained 75 years ago or in 1931 under very different circumstances for very different line types, electric line types as applied to current conditions of 2006 and the current conditions of this line?

A I'm not the correct person to answer that question in

terms of the validity of the right-of-way agreements that Duquesne Light signed for this -- for any of these rights-of-way. All I can tell you is that the right-of-way that Duquesne Light owns on Alternative E and any other right-of-way that they own, right-of-way agreements that we received, we assumed that they were valid and the assumption is not only on the paper that they're written on but also the fact that Duquesne Light occupies the right-of-way currently.

Q Yes, I understand. My question was valid not from legal perspective, but from technical perspective because those rights-of-way were obtained in 1931, some of them, okay, for very different purpose and the purpose was to conduct current of I don't know which power, but maybe 4 kilovolts and now --

MS. SESTAK: Objection.

Q -- the right-of-way and so on --

JUDGE NENE: On what grounds?

MS. SESTAK: The question is misstating the evidence. Although the right-of-way agreements have not yet been introduced into evidence, they are part of the Record of the written testimony and they do not state that they were for the purpose of 4 kilovolt lines.

JUDGE NENE: I think you can ask that question of the witness who testifies about the right-of-way.

MR. LAPETS: Okay. I have the last question.

BY MR. LAPETS:

Q Why you did not compare the full length of all the routes that were suggested? You compared only a little fraction of those routes that comprise non-existing rights-of-way and for Route E its basically zero, then Route E shouldn't even be compared.

So the question is, why you did not compare the full length of the routes?

A Well, I think -- and I stated this earlier -- its almost exactly the same question and that is that all of the alternatives and all of the land use and all of the other land uses on all the other alternatives was tabulated and considered by our experts that were involved in the site and evaluation process.

Where existing right-of-way within which a current subtransmission distribution system exists where we would be replacing that subtransmission distribution system with a 138 kV line and the distribution that's currently there, we considered that to be very little, if any, impact because once again we're putting an electric transmission system in a right-of-way, within a right-of-way where a current electric system exists and on a pole for pole basis and so the land use won't change, there will be no significant or any impact on natural resources. The only affect that it

would have -- and this would be on all of the routes -- would be the disruption of traffic that will occur during the construction process.

Q Okay. And the last question, so in my case my house is located ten feet from that center line and so basically what you are saying the increase of the voltage on that line from 23,000 to 138,000 volts will not change anything like for me visually, emotionally and there will be no impact and the only reason because its already existing right-of-way and that's why there would be no impact on the residential as you just said; is that true?

A Well, I don't know specifically where you're located. You said ten feet.

Q Near the old circle. I'm just ten feet, that's the shortest distance from the center line to the edge of my house.

A So you're ten feet from conductors you're saying?

Q Not from conductors, from the center line of right-of-way, okay, but what I'm saying -- asking is, you said that there is no -- absolutely no impact if there was an existing right-of-way. I'm giving you example where I'm asking do you think there is no impact on people like me -- and there are ten people -- ten households there in similar conditions, the distance will differ slightly from the lowest, some may have 15 feet, some may have maybe five feet

or maybe two feet or maybe crossover their house -- but you say that if we put high voltage line, there will be no impact, visual, emotional, whatever; is that true?

A Well, I can't speak for your emotional impact, but I can tell you that if you have cables crossing your property right now, you'll have cables crossing the property at the same location. If you have a structure on your property right now, you will have a structure at the same location.

I also understand -- and there are other witnesses that are available to address that -- that Duquesne has approached people in the neighborhood to adjust the location of --

Q It has nothing to do with the study, with the study that you have done. I'm just asking to the point of the study.

A Well, I'm afraid I can't address --

Q Okay. Thank you.

A If it doesn't have anything to do with my study, I can't address it.

Q You made a conclusion there was no impact because of the existing right-of-way. I just give an example in question there is impact, increased impact or additional impact.

A What is that?

Q Pardon?

A What is the additional impact?

Q Because the line -- the existing line requires a particular distance, its like 25 feet from any structure. That's the requirement for the 138 volt line, so for the other line, as you just mentioned before, there was not any requirement, you can put that line anywhere you want and so because you can put that line anywhere you want, it doesn't mean that if you over build another line that everything is fine. In many cases it is fine, but in some cases its not and that's what I'm trying to --

MS. SESTAK: Objection. Your Honor, the question assumes facts not in evidence specifically that there is some requirement of a 20 foot -- 25 foot distance between the existing line and a structure.

JUDGE NENE: And are you saying there isn't?

MS. SESTAK: Your Honor, we have witnesses who can address the National Electrical Safety Code requirements for distance between lines and structures, however, there is nothing, to my knowledge, in evidence that indicates 25 feet is one of those distances.

JUDGE NENE: Mr. Lapets, you're through with your questioning?

MR. LAPETS: Yes. I'm done. Thank you.

JUDGE NENE: Mr. Janosko.

MR. JANOSKO: Your Honor, if it is possible, I

don't know if this is allowed, but I would like to have Mr. Balik ask questions on my behalf, if that's possible.

JUDGE NENE: He's not an attorney, he can't do that.

MR. JANOSKO: All right.

JUDGE NENE: You are not an attorney, are you, sir?

MR. BALIK: No.

CROSS-EXAMINATION

BY MR. JANOSKO:

Q Mr. Houston, have you given -- you had commented that you were asked by Duquesne Light to give the cost estimates for the line options. Have you guys done that?

A Well, his Honor asked Duquesne Light for a cost estimate and at that point in time Duquesne Light contacted one of our Engineering Managers to provide a cost estimate for each of the -- I think its each of the alternatives, isn't it or is it just --

MS. SESTAK: I believe it was C.

THE WITNESS: C.

BY MR. JANOSKO:

Q Is that available?

A I don't know. I'm not dealing with the cost issues at all. I told the Judge that.

Q But you said you --

A The engineer's --

JUDGE NENE: Just a second. Are you prepared to produce that evidence at some time in the hearing?

MS. SESTAK: Yes, Your Honor. If I could, by way of explanation, what's being called a cost estimate was, in fact, two of Duquesne Light Company's engineers, along with a GAI engineer, did a study of the Route C in the interest of developing a cost estimate because no prior cost estimates had been developed on any line.

JUDGE NENE: All right. It will be introduced later and you can Cross on that.

MS. SESTAK: Yes, I believe Mr. Schmitt and Mr. Cass were involved in that and I believe Mr. Cass is going to present the information.

MR. JANOSKO: The reason why I ask this, Your Honor, is because Mr. Houston had said that his company was asked to produce a cost estimate and that's -- he mentioned that before and I'm just asking if that figure is available.

JUDGE NENE: Counsel said its going to be made available later.

MR. JANOSKO: Okay. Sorry. Okay.

BY MR. JANOSKO:

Q When Ms. Sestak was questioning you, she had brought up line development in third world nations; is that true?

A That's correct.

Q The lines that you were involved with at that time, what was the current status of residents in that area, meaning was it barren land, was it residential, was it suburban, highly densely populated?

A In the Dominican Republic it was a combination of in some cases barren land and some dense urban development and suburban development.

Third world countries aren't developed quite the same way we are.

Q Okay.

A But there was a variety of different land use types in terms of habitation.

Q Did this involve placing high voltage lines in similar population densities as the proposed line along Route E?

A Both as populated and more populated and less populated, yes.

Q Okay. Looking at table A-4 --

A This is in --

Q In Duquesne Light's testimony.

A This is which Exhibit?

Q This is table A-4 in the testimony provided by Duquesne Light.

JUDGE NENE: In Mr. Houston's testimony?

MR. JANOSKO: Yes.

THE WITNESS: This would be my Exhibit RH 3.

BY MR. JANOSKO:

Q You had already mentioned numerous times that the current right-of-way was not considered when tabulating scores.

A That is correct.

Q If on the current route -- meaning the current proposed route by Duquesne Light, Route E -- if there was no current right-of-way and this had to be created by Duquesne Light, would that have an affect on these scores?

A You're saying no current electric lines or electric infrastructure?

Q No current right-of-way.

JUDGE NENE: Which would mean no lines, I would think, wouldn't it?

THE WITNESS: I would say so, yes, sir. Yes, Your Honor.

A Well then, of course, it would be all new right-of-way and it would receive a different score.

Q Have you got -- has your company considered that when tabulating these scores, meaning that you -- your company may have tabulated scores for current right-of-way, but since that number was not -- that current right-of-way was not considered in the final score, those numbers were omitted?

A I don't understand the question at all.

JUDGE NENE: I think the question addresses whether or not if you had to purchase all of those rights-of-way, would you have opted for the same course, E?

THE WITNESS: Well, it would have received a much higher score from the environmental standpoint if --

JUDGE NENE: Is that your --

MR. JANOSKO: He's answering my question.

A Okay. It would have received a much higher score if Duquesne Light had no electric infrastructure along the road and new right-of-way had to be established and that's exactly the way new right-of-way was judged throughout the entire study. If new right-of-way is required, then it receives a much higher score because you would be changing land use.

JUDGE NENE: And also because there's no existing lines there most likely?

THE WITNESS: Exactly. That's exactly right, Judge.

BY MR. JANOSKO:

Q Did GAI consultants actually tabulate a score for current right-of-ways at all, whether it was included in the study or not?

A Did we -- you're going to have to phrase that -- that one went by me.

Q For instance, on Table A-4 --
A Okay.
Q -- under all the areas that are -- have a superscript of 1 --
A This is table 4?
Q Table A-4 environmental impact scores alternative routes you have a subscript of 1, you say data is for portions of the route which are either on new right-of-way or non-alleged line right-of-way.

For current right-of-way in these areas that have a separate subscript was there ever any score tabulated or calculated, whether it was included in the study or not?
A Let me ask you if this is the question you're asking me, if the line -- if an alternative is on new right-of-way or non-electric right-of-way did we tabulate a score for it?

The answer is yes, because basically the assumption behind this is that if its on non-electric right-of-way, to establish an electric right-of-way at that particular location would require a change of land use and potential impacts to the use that people are putting their property -- to which they are putting their property, because if a right-of-way would be required then they would lose some types of uses of that property including built structures and so forth.
Q Okay. My question is, on current right-of-way where

there are electrical wires already in place, even though that has not been considered in the final scoring, was there, in the process of generating the scoring system, was there ever any values given to them?

A Well, I think I mentioned that all of the alternatives, whether they were sited on existing line right-of-way, new right-of-way adjacent to roads, adjacent to railroads, the group of experts which worked with me to site and evaluate all of these alternatives looked at the adjacent land use, the current land use and the resources, historic and archeological data and so forth for all of the routes and one of the reasons for doing that was to verify and validate the assumption that if we put this new facility within existing electric utility right-of-way, that we'll have little or no impact.

MR. JANOSKO: Your Honor, the reason why I'm asking this is because of feelings of concerned homeowners that even though Duquesne Light has a current right-of-way setup, it still has an impact to the current residents.

JUDGE NENE: A greater impact?

MR. JANOSKO: What?

JUDGE NENE: A greater impact?

MR. JANOSKO: Yes. Thanks for taking the time to answer that. I know this is frustrating for you.

THE WITNESS: Well, no.

MR. JANOSKO: Because you keep repeating yourself.

THE WITNESS: Its not frustrating, its my job.

A (Continuing) To further answer that question, because I understand where you're coming from, we did consider all of the inhabited residential units, all of the -- in the addendum report and that was the purpose of that, was to take into consideration the concern that the residents of not only McCandless and Hampton along Alternative E and E-1, alternatives E and E-1, but also folks along the other alternatives for putting a transmission line through a suburban neighborhood and that's why the analysis was done.

Once again, Alternative E still came out No. 1, even taking into consideration all the homes adjacent to the right-of-way.

Q Okay. Looking at Table A-1 in your testimony, on the second page, under the resource evaluation criteria, houses within a hundred feet of the center line, is this value of a hundred feet arbitrary or is it a standard set up in the State of Pennsylvania?

A Well, the State of Pennsylvania does not have a standard distance. The only standard that Pennsylvania has in terms of -- for electric transmission lines is the exercise of eminent domain. You cannot exercise eminent domain within a hundred meters, which is approximately 330

some feet, of an occupied dwelling and that's once again to protect peoples land use in terms acquiring the right-of-way.

However, the Federal Regulatory Commission in the siting of gas pipelines wants to know where all of the residential structures are within 50 feet of the center line of a gas pipeline transmission corridor and also the state of Virginia, State Corporation Commission, requests information on all structures within a hundred feet of the center line.

So, considering those two and the fact that we have done quite a bit of gas pipeline siting as well as a lot of transmission line work in the state of Virginia, and they were the only state where we have done work recently that has any type of measurements to structures, we thought that that would be appropriate to use a hundred feet.

Q Is this -- so this hundred feet in the State of Pennsylvania is essentially an arbitrary value by your company because there's no set standard in the State of Pennsylvania; is that true?

A Well, yeah, but I wouldn't say its arbitrary on our part. I would say that we selected that not only because we have used it in the state of Virginia, but our urban planners thought that it was an appropriate distance.

Q This distance of a hundred feet, when you have done

similar studies in the past, either for Duquesne Light or other utility companies in the State of Pennsylvania, have you always used -- has your company always used this value?

A This is the first project --

Q Its just yes or no, sir.

A No.

Q Okay.

A Well, actually, I think you deserve the right to know the --

MR. JANOSKO: That's all I needed to hear.

JUDGE NENE: That's all he wants.

THE WITNESS: Okay.

JUDGE NENE: Do you object to that? Do you want the witness to answer further?

MS. SESTAK: Your Honor, at this stage in Mr. Houston's Cross, I believe everybody probably understands, but I will give him a chance on Redirect to explain that.

JUDGE NENE: All right.

BY MR. JANOSKO:

Q The resource evaluation criteria, you have mentioned in prior testimony here that there are some standards set up in the State of Pennsylvania; is that true?

A That's correct.

Q The resource evaluation criteria that you have in this study for Duquesne Light, some of the criteria are not

standardized.

A Are you asking me a question?

Q I'm asking you a question.

A What do you mean standardized?

Q Are all of these resource evaluations standardized?

A What do you mean standardized?

Q Meaning that whatever environmental consultant or consultant company would have to use the same exact criteria regardless of where an electrical utility line was setup in the State of Pennsylvania.

A Well, I can't answer that question from the standpoint that only GAI has done formal siting applications to the Public Utility Commission.

Q Is this criteria a criteria you have used in all of your prior studies?

A That is correct.

Q In the State of Pennsylvania?

A That is correct. Yes.

Q But there is, other than the broad standards set up by the State of Pennsylvania, there are subcategories here where another consulting company, not necessarily yours but another one, can set up slightly different criteria such as the 100 foot center line for an example?

A You mean houses within a hundred feet?

Q Yes.

A Well, we have already established that that is not required by the State of Pennsylvania.
Q I'm just using it as an example.
A All the evaluations that were used are responsive to the Public Utility Commission, in terms of the list of items that I gave in my testimony earlier this morning, and in --
Q But within those categories you are allowed some leeway in setting up criteria?
A Well, as long as these criteria address the concerns of the Public Utility Commission and their regulations, its -- you can call it whatever you want, but you have to address those criteria and we have successfully addressed those factors and those requirements using they criteria on many line evaluations in the past that came before the Commission.
Q Okay.

MR. JANOSKO: The pictures, Your Honor, the pictures that have been presented, are they entered into formal evidence?

JUDGE NENE: No.

MS. SESTAK: No, they are not.

JUDGE NENE: They have been used just as visual aids.

MR. JANOSKO: My concern is, with the photographs here, is that these are doctored photographs,

they have no line of reference to what is actually up there currently.

JUDGE NENE: That I think was --

MR. JANOSKO: Because we have no way of comparing the ratio of the current line poles height to the new poles height.

JUDGE NENE: I think the witness testified pretty clearly to that, that they were constructs.

MR. JANOSKO: The other concern I would have is that in the one photograph you have trees that are extremely close to the current utility line and Mr. Houston commented, looking arbitrarily at those trees, would those be somewhat of a concern for you when a new high voltage line goes up, meaning that they may need to come down or either be trimmed.

THE WITNESS: I think I mentioned when I was asked that, you know, how close those trees actually are to the conductors is a matter of perspective and I would prefer that the -- that our expert witness on vegetation management address that -- those types of questions in terms of not only what may have to be removed, but the remedies in terms of mitigation to removal that Duquesne Light is offering and does normally offer when vegetation management requires that the trees be either trimmed back or removed.

MR. JANOSKO: Okay. Thank you, Mr. Houston.

I have no further questions, Your Honor.

JUDGE NENE: All right. Before you step down or before you proceed any further, my secretary, in response to a request from a lady in the hearing room Barbara Zaun, Ms. Zaun approached me and indicated that she had filed a protest, a formal protest and I have a copy of that here. I'll provide counsel with a copy, but it is a docketed document and protests the line.

Ms. Zaun was present and I think you have testified twice at public input hearings and provided a significant folder of documents indicating the residents on Thompson Run Road.

You have every right to ask questions of this witness if you would like and any future witnesses.

MS. ZAUN: I do have one question if you could answer it.

CROSS-EXAMINATION

BY MS. ZAUN:

Q If you could refer to Exhibit R of the one picture that I had shown, that someone should have a copy of that, Exhibit R.

JUDGE NENE: I'm a providing the witness with a copy of your Exhibit R, which was introduced into evidence at a public input hearing. Its a photograph.

Q (Continuing) My question to you -- given your

expertise -- if you look at the houses that you see on that Exhibit, you will see that this house has a sidewalk and the houses on each side of it have trees that border the road and I think you can also see the poles, especially if you hold it this way, you will see the shadow of the telephone poles. So the poles are clearly evident.

A You're talking about --

Q The current telephone poles.

A Its difficult for me to tell what's a pole and what's a tree.

MS. ZAUN: Judge, would we be able to show him that with a picture that I have of my home that I brought that shows the pole and the tree?

JUDGE NENE: Yes, you can show him that.

BY MS. ZAUN:

Q My question for this -- you made the statement a few minutes ago that there would be no negative impacts on natural resources. You also said there would be no impact other than the installation of the pole. Off course, this is personal as a homeowner, for me its a great impact as far as esthetics.

Here is my telephone pole, here clearly shows the line of trees. Given your expert background, would you feel that those trees, those are oaks, that they would have to be removed because of the new pole, or should I wait for the

vegetation expert who is to --

A I would prefer we wait until the vegetation expert, because, first of all, I can only see the bottom of the poles and the trucks of trees.

Q I think you can see here the trees are rather tall. This is from 30 yards in the air and like the trees across the road --

A Well, the shadow cast depends upon the angle of the sun. Of course, this is during the wintertime so the sun is very far down in the southern sky. From a photograph like this --

Q You can't tell?

A -- I don't think you can interpret the height of trees.

Q If you look at my house here, wouldn't you agree these trees around my home are all taller than my house?

A From this perspective it appears they are, yes.

Q And then, of course, from this perspective, too, in a different season you can see that these are well taller than the home and here is a larger picture of the pole and the trees are much higher and you see the proximity of all of these trees to the road.

Given what you see there, would you conclude that perhaps those would need to be removed?

A I would defer to the opinion of the vegetation

management expert from Duquesne Light.

MS. ZAUN: Okay. Thank you. I will wait. Thank you.

JUDGE NENE: You may want to -- I hate to ask him, but if you want to ask questions concerning those, maybe you want to introduce them into evidence also.

MS. ZAUN: Okay.

JUDGE NENE: You might have time to do that.

MS. ZAUN: Will I get them back or should I make copies?

JUDGE NENE: I think you will want to make copies and make them part of the Record.

MS. ZAUN: I will do that. Thank you.

JUDGE NENE: I'll make sure you get a copy of this.

MS. SESTAK: Thank you.

JUDGE NENE: Do you have Redirect?

MS. SESTAK: I just have one Redirect question.

REDIRECT EXAMINATION

BY MS. SESTAK:

Q Mr. Houston, you began to clarify a question about the 100 foot criteria in the addendum that Mr. Janosko had asked you and you were cutoff and not permitted to finish your explanation.

Would you like to finish your explanation?

A To be honest with you, I forget the question at this point.

JUDGE NENE: Very good. Anything else?

MS. SESTAK: No, Your Honor.

JUDGE NENE: You may step down. Thank you.

THE WITNESS: Thank you, sir.

MR. KRIST: Bruise Krist. I came in later and I didn't put my name on the list.

JUDGE NENE: Yes, you were a named participant and we didn't know you are here. You want to sign in, please.

MR. KRIST: Yes, I did.

JUDGE NENE: Great. While we're doing this maybe Ms. Zaun will sign in.

Mr. Krist, do you have any questions of Mr. Houston?

MR. KRIST: Yes. I have a couple of things, but I would also like to, so I don't forget to ask, that you may recall him once we talk about the rights-of-way of the line with Duquesne Light because some of the other questions -- a question I would have would be relevant to the rights-of-way, so I would ask that I ask a few things, but then ask to call him back at a later date to keep things in order with the rights-of-way. Is that not allowed?

JUDGE NENE: Did he testify about rights-of-way?

MR. KRIST: No, but it will go in with some of the things I want to talk about. I'll start with my questions.

JUDGE NENE: Does his testimony concern -- raise questions about right-of-way?

MR. KRIST: The problem is his study talked about the rights-of-way and if he can't talk about why those routes were chosen, then the questions -- those questions need to be asked first, why the routes were chosen in the first place before I talk about the analysis of the --

JUDGE NENE: He mentioned some things about right-of-way and you can ask questions now and if they're objected to we will rule on the objection.

MR. KRIST: Okay.

CROSS-EXAMINATION

BY MR. KRIST:

Q What input, if any, do you have on the routes that were chosen?

A You mean me personally?

Q As far as when you do the study.

A You mean GAI or myself personally?

Q Both GAI and yourself.

A Well, it was a combination of myself and several

people from GAI that actually selected the routes.
Q Okay. Of the routes that were chosen, why was there not another route chosen that was substation to substation?
A Well, because we were asked to actually find appropriate places from an environmental standpoint to tap the North Pine Creek Substation -- North Pine Creek 138 kV line. It just so happens that Alternative E would either tap it right adjacent to the North Substation or could go into the North Substation.
Q Is there another alternative that could go substation to substation that wasn't proposed?
A That's the only one that goes substation to substation.
Q No, is there another one proposed? Was there another one proposed? Yes or no.
JUDGE NENE: Mr. Krist, you ask the question and then the witness answers, then you can ask another question.
MR. KRIST: He is not answering the question.
JUDGE NENE: You interrupted him.
MR. KRIST: Okay.
JUDGE NENE: Are you through?
A Well, despite the interruptions I think I made it clear that it wasn't our charge to go substation to substation, so alternative E is the only one that happens to

go substation to substation.

Q All I asked is there another -- is there an alternative that could go substation to substation? Do you think there's one just from looking at -- did you do any kind of analysis, did you do any kind of look at that? Do you suppose there could be another alternative that could go substation to substation?

A Well, we selected what we thought were the most suitable alternatives to evaluate based upon a lot of data that was acquired from both area photography, the resource agencies and I guess there could probably be a thousand variations of all of the various street patterns and so forth, but these are the ones that we thought were most suitable to evaluate and those are the ones we evaluated.

Q The point is that this study -- if you go substation to substation you don't have a one-to-one correlation with these other alternatives, none of them go substation to substation. You need to have something that's more similar to do those, to do a substation to substation comparison for your analysis. They all require -- the other alternatives require a right-of-way.

I'm asking if there is another alternative that would not require a right-of-way so you could do a proper analysis?

A For Duquesne Light to be able to provide -- I don't

want to step on the engineer's toes and they will elaborate on this -- this is what I was told when I was given my charge from Duquesne Light and it has not changed, please find a suitable list of alternatives and select a preferred alternative to transmit 138 kV power from a tap point somewhere along the Pine North transmission line to the Wildwood Substation and a tap point will certainly work, I have been told, and going into the North Substation certainly works.

MR. KRIST: I don't feel I have gotten the answer to the question.

JUDGE NENE: That's the answer. Is that the answer?

THE WITNESS: That's the answer.

MR. KRIST: I believe there is an alternative route and I would like them to pursue looking at one because it can go substation to substation and -- let me find some of the documentation.

On their web site, its question 21, why has Duquesne Light amended their application to the PUC, one of the things in there that it describes, Duquesne Light joined the PJM interconnection on January 1st, 2005. PJM is a regional transmission organization which comprises utilities that service parts of 14 northeastern states.

Let me find the meat of it because there's a

paragraph in here you could probably just take this. I'm getting close to it. PJM manages a regional planning process to assure future electric reliability within its control areas. As a result of joining PJM, certain operating requirements must be completed that will ultimately require the proposed line extension be terminated at its --

JUDGE NENE: Mr. Krist, this is a Court Reporter. This is not a tape recorder.

MR. KRIST: I apologize.

JUDGE NENE: You have to speak slow enough so she can hear you.

MR. KRIST: -- the substation be terminated at its own source, i.e., a breaker at North Substation rather than a tap of another transmission line. The need for terminating the line at North Substation is not immediate but will be required in the very near future, five to seven years.

I mean, none of the other alternatives satisfy that criteria.

JUDGE NENE: Is that a question?

MR. KRIST: I think you need to do an analysis that would satisfy a substation to substation. That's basically what Duquesne Light is saying here and they did not do that. I'm asking why they -- you know, on one hand

they're saying here they need to do substation to substation and I asked if there were alternatives, its possible that there are. I think you need to do that for the GAI study to make sure you compare apples and oranges -- apples and apples.

JUDGE NENE: You're testifying. Ask the witness if he did so and why didn't he do so.

BY MR. KRIST:

Q Is this a requirement that you considered at all?

A No. I told you what we considered. We were asked to go from a tap anywhere along the Pine North 138 kv line up into -- and transmit power via a 138 kV line up to the Wildwood Substation. You know, there was no requirement to go into a substation and I don't think there still is a requirement. I think probably what that is on the web site is an overstatement of the PJM requirements.

Duquesne Light has joined PJM a year or so ago and I don't think the requirement is of PJM on an urban transmission system -- which is what Duquesne Light is considered -- has been fully considered yet. One of the engineers coming up later would be the appropriate person to ask that question.

I think that a tap on that line is still an appropriate end point.

Q The other alternatives?

A Yes.

JUDGE NENE: Mr. Krist, do you have anything more?

MR. KRIST: Yes.

JUDGE NENE: Proceed, please.

BY MR. KRIST:

Q In speaking Mr. Janosko was talking about the rights-of-way and evaluating the criteria based on the non-existing right-of-way --

JUDGE NENE: I can barely hear you.

Q -- the non-existing rights-of-way compared to the existing right-of-way. Can you -- are you able to do an analysis of the -- quantify the effects of that, what the rights-of-way are for Route A as compared to not having to have a right-of-way for Route A?

A Your question is if Duquesne Light wasn't an existing right-of-way along Route A or E or any of the other routes would we have the data available to be able to do a comparison and the answer is yes, because once again we looked at all of the land use on either side and within each of the proposed alternatives in order to be able to have the necessary data available and the necessary analysis available to be able to determine if the valuation process we used was a valid one.

Q Was there any kind of analysis done on Route A with

no non-existing -- without an existing -- say it had a right-of-way along the whole line.

A I don't understand your question. In other words, with or without right-of-way? What are you saying?

Q If you had the full right-of-way on Route A.

A You mean, in other words, if Duquesne Light owned the full right-of-way along Route A?

Q Route A.

A Did we do an analysis of that and the answer would be no because Duquesne Light did not have a full right-of-way, so it would have been -- I don't charge my clients to do theoretical studies. We do practical studies so --

MR. KRIST: What I would like to do is ask the engineer about the right-of-way on Route A and then ask about the scoring based on the parts of the right-of-way that they had to --

JUDGE NENE: You can ask the questions when the witness testifies.

MR. KRIST: When the witness testifies?

JUDGE NENE: Yes.

MR. KRIST: Okay. But I'm just meaning to call him back based on whatever the engineer replies on that, that's why I wanted to reserve the right to call him back.

JUDGE NENE: I don't understand what you're --

MR. KRIST: Well, Route A is -- I would like to argue that you don't need a right-of-way at all on that, you should be able to use an existing right-of-way on Route A. The analysis they have done is based on a right-of-way that they said they don't have.

JUDGE NENE: This witness didn't testify about the right-of-way on that road.

MR. KRIST: Exactly. That's why I'm saying I have to wait until I ask that other person before I get into the --

JUDGE NENE: He didn't testify about that. I don't know why you would want to ask him questions.

MR. KRIST: Well, because their analysis was based on the fact that it needed a right-of-way.

JUDGE NENE: Okay. Is there anything else?

BY MR. KRIST:

Q Do you have any information in the scoring that takes into account the amount of usage in certain areas of the path that you're studying?

A Uses at --

Q As far as electric usage. Do you account for any -- they're saying part of the reason for this is the demand and the growth in the areas.

Was there any information given to you based on where that growth is specifically, as to what area it affects,

where the line goes, is the growth in the area of Route E, how much growth in usage is in Route A, electric usage?

A In other words, did we punish the people that are responsible for the need for the line? No, I'm -- that's the interpretation I got of the question, but I know that's not what you're asking.

You're asking -- see, the Wildwood Substation -- and this is not my area of expertise, one of the engineers will give you the details -- but the Wildwood Substation is going to be upgraded from 23 kV to 138 kV so that it can serve the area where the growth is occurring.

JUDGE NENE: This is a transmission line and nobody is tapping off it to use as a distribution line. Its a transmission line. Its getting the 138 power to the desired destination. It will be distributed from there.

MR. KRIST: But part of the reason this was done was also the reliability of the current existing areas, too.

MS. SESTAK: Your Honor, I believe that that's covered in Mr. Zucconi's written testimony where he explains that the purpose is not only to relieve the present load on Wildwood Substation but to relieve the load on Pine and North Substations as well and that the distribution lines will be reconfigured upon completion of the Wildwood Substation project.

JUDGE NENE: Were you here for Mr. Zucconi's testimony?

MR. KRIST: No, I wasn't.

JUDGE NENE: Okay. Do you have anything else of this witness?

MR. KRIST: Well, is that --

BY MR. KRIST:

Q All I asked was a yes or no question, whether that information was -- whether it could be evaluated as part of the criteria. Is that a no then?

A It would not be appropriate to, since His Honor is correct, the purpose of this project is to get power from somewhere along the Pine North 138 kV line to the Wildwood Substation. It has nothing to do with where the growth areas are. The growth areas will be served by those three substations.

Q I guess I'm confused. You know --

A I want to help you understand --

Q Can you show me how it is going to help each of --

JUDGE NENE: Actually, I think that was this morning's testimony from Mr. Zucconi. He testified as to the need for this line. I don't think we can go back and revisit it. We have got a lot of testimony to cover and we have covered that.

MR. KRIST: I'm just wondering if they included it in their study and I think the answer is no, that they don't include any growth of the usage, how the growth is, the expected growth in the future based on where they would route the line. I'm just asking a yes or no question and I get an explanation, I didn't get a yes or no.

THE WITNESS: I said no, it would not be appropriate to use that type of criteria to evaluate the location of a line that's going between two end points.

BY MR. KRIST:

Q I still don't understand why, though. I mean, that's the --

JUDGE NENE: Okay. I think that's enough. It has been answered. It has. I think you can step down now.

THE WITNESS: Thank you, sir.

JUDGE NENE: Its been an hour and 15 minutes. I think we should take a break, ten-minute break, recess before we call the next witness.

(Thereupon, a recess was taken).

JUDGE NENE: Ms. Sestak, another witness?

MS. SESTAK: Yes. Several other witnesses, Your Honor, but I will take them one at a time. I would next like to call David Fugate.

JUDGE NENE: Have you been sworn, sir?

MR. FUGATE: I have, Your Honor.

JUDGE NENE: Thank you.

DAVID W. FUGATE,

having been previously duly cautioned and sworn, testified as follows:

DIRECT EXAMINATIOn

BY MS. SESTAK:

Q Mr. Fugate, would you state your name and spell it for the benefit of the Court Reporter.

A David W. Fugate. D-a-v-i-d, G-u-g-a-t-e.

Q Mr. Fugate, are you a Duquesne Light company employee?

A No, I'm a subcontractor. I'm a consultant to GAI. I was subcontracted to do electric and magnetic field calculations for the Wildwood -- for the proposed Wildwood line.

Q Did you prepare written testimony for this hearing today?

A Yes, I did.

Q And is your written testimony contained in the document labeled Statement No. 3?

A Yes, it is.

Q And Mr. Fugate, attached to that document did you also provide Exhibits DWF 2 -- I'm sorry, DWF 1, a statement of your education and profession and publications?

A Yes.

Q And did you also provide DWF 2, a report of your calculations concerning electric and magnetic field affects?
A That is correct.
MS. SESTAK: Your Honor, I offer Mr. Fugate's testimony and Exhibits into the Record.
(Thereupon, the documents were marked as Exhibit DWF1 and DWF 2 for identification).
JUDGE NENE: They will be admitted into the reported subject to Cross-Examination.
(Thereupon, the documents marked as Exhibits DWF1 and DWF2 were admitted into evidence).
BY MS. SESTAK:
Q Mr. Fugate, I have a few additional questions for you just to clarify your testimony and to address matters that were raised at the public input hearing.
Were you present at the public input hearing?
A No, I was not.
JUDGE NENE: There were three of them.
THE WITNESS: There's no excuse, right?
BY MS. SESTAK:
Q Before we go through the specifics of the public input hearings, I would like to clarify one thing about your testimony that I'm not sure is clear to the participants.

Now, when you calculated the changes in magnetic fields and electrical fields that would occur due to the change of the present configuration of the 23 kilovolt subtransmission line to the 138 kilovolt transmission line along Route E, did you prepare charts showing your findings?

A Yes. I made graphs that showed the calculated electric and magnetic fields and specifically the charts show for given cross-sections that are representative of the proposed configurations at various positions along the route, it shows the existing -- or calculated electric and magnetic fields for existing peak and average load conditions and then also for the proposed -- with the proposed 138 line for peak and average conditions at the time of cut-in when this line would go into service.

So what you see in those graphs is a comparison of -- that attempts to compare apples to apples, in other words, what is there now and what's going to be there at the time that the new line goes into service.

Q And just by way of background, when you calculate these field levels, do you sometimes find in practice that when you go out and actually measure, the actual measurement differs from your calculation?

A Oh, yes, quite a bit, and that's something to keep in mind with the calculations in general, that they're representative of a certain condition and the electric and

the magnetic fields depend on a wide range of factors and so they're basically representative. They're meant for a general comparison.

With respect to electric fields, they depend on the voltage of the phase conductors and the height and the configuration of phase conductors. In general when we go out and measure the electric fields, they're relatively stable because the voltages don't change on the lines, but the other thing that we do find is that generally nearby structures, other phone and cable shielded lines or shrubbery and trees and things like that will tend to reduce the fields when you go under and measure them. So generally what that says is that our calculations are fairly conservative in that they tend to overestimate the electric field that's actually going to be there with the magnetic field.

If I could just elaborate on it, why its difficult to hit right on is again because there are a number of factors, but the biggest one for magnetic fields, unlike electric fields, which are relatively constant because of the constant voltage, the magnetic field from the power line depends on the load currents flowing at the time and loads vary, just as Homer Zucconi testified, there are cycles through the day, there are seasonal cycles and things like that and so the actual magnetic field that you would measure

depends on the loads that are being carried at the time you would make the measurements and oftentimes you're making measurements in locations where the exact currents are not metered, so you're estimating the currents and things like that.

One final thing, because they vary so much, you tend to talk about magnetic fields in a statistical sense. In the graph you will see an average and a peak where the average is kind of representative of what it would be over a long-term. The peak is kind of toward the maximum end of what you would see for a very brief period of time.

My understanding is that the numbers that were given for the analysis, the peaks on the 23 kV circuits were the actual peaks from 2004, the highest load on the individual circuits in 2004.

Q Okay. There was testimony at the public input hearing that the line being proposed would put five or six times more power through that populated area. From that could we extrapolate that this would cause the magnetic and the electrical fields to be five or six times as strong?

A No, because the power that's transmitted is the product of the voltage times the current and so actually going to a higher voltage allows you to have a lower current and thus lower magnetic fields for a given amount of power that you're transmitting.

The flip side is that the higher voltage does lead to a higher electric field by approximately that factor that you're increasing it, a factor of approximately six, but the actual electric fields are going to depend on the height of the conductors above the ground and so with the 138 kV, its slightly higher.

So, you actually don't get a factor of six increase in the electric field, but you will get an increase obviously beneath those lines and then for the same amount of power you're currents are lower and so if you're comparing what you're transmitting along that line switching from 23 kV to 138 kV, you can transmit more power for lower current and potentially have a lower magnetic field.

Q Is this shown on the calculation you performed that's labeled case 2 in Exhibit DWF 2 attached to your written testimony?

A I'm sorry, case 2?

JUDGE NENE: Page 6.

Q Case 2.

A Page 6?

Q Yes, page 6 case 2 in your Exhibit DWF 2. I'm looking at the chart in your testimony.

JUDGE NENE: Yes. Repeat the question.

A Right. But what's the question? I'm sorry.

Q Does this chart show or demonstrate what you have

just said about the increased electrical field and the decrease in magnetic field?

A Yes. The two figures on this page, the top one the magnetic field and the bottom one the electric field, are a good example because the case 2 configuration is simply the 23 kV subtransmission circuit being replaced with the 138 kV circuit and so what you see at the top part is the peak and the average for the existing would produce a higher magnetic field than the proposed peak and average just because of the increase in the voltage.

But now when you go down below to the electric field, you see an increase in the electric field associated with the higher voltage.

Q Okay. There was some question at the public input hearing if its possible that the magnetic field actually decreases with an increase in current.

Is it your testimony that it does?

A For the assumed loading at the time of the cut-in, that's a correct assumption. However, you should note that there will be load growth in the area and there's some assumed load growth over time and so what you would also tend to see is that, you know, the numbers of the magnetic fields associated with the 138 kV line would also continue to increase over time.

You can balance that on one hand and say that if it

were possible to upgrade the conductors on the 23 kV line so that it could carry more current to continue to take care of the demand, that the magnetic fields would also increase with that, but that's not necessarily a practical case, that it may not happen.

But it is certainly the case that for the calculations we did at the time of the cut-in, that it looks like on nearly all of the configurations we looked at, the peak magnetic fields in close to the line certainly go down. As you out away from the line, because the fields fall off so rapidly, you hardly see any difference in the magnetic fields moving out away.

Q Is this consistent with what appears in the case 3 chart as well?

A Case 3, it looks like there's actually a slight increase, although its very minimal. I mean, if I were to summarize the results from the case 3 situation, I would say there's hardly any change in terms of the calculated magnetic fields. The reason for that is that you have also got another distribution circuit that's fairly heavily loaded that would be called an underbuild, that's beneath the subtransmission 23 kV right now, and when the new 138 kV line is installed on the poles, then that distribution circuit would be constructed underneath as an underbuild and so that in this situation, my understanding is that would be

fairly similar, at least at the time that it cut-in.

JUDGE NENE: Can you take the canary out.

MS. SESTAK: I think if it does it one more time I'm going to take it and put it in a bucket of water somewhere. Fair warning.

FROM THE FLOOR: He can't figure out the phone, how can he figure out the ratings.

MR. HOUSTON: That's exactly right.

BY MS. SESTAK:

Q Mr. Fugate, I'm not certain if we discussed this, but going back to your case No. 2, was that calculation performed for the Shady Oaks Circle area?

A Yes, that's my understanding, based on the labeling that was given to it.

The way the process works in terms of calculations is that Duquesne Light engineers and GAI engineers worked together to assemble the dimensions and the heights and the conductors and the conductor sizes for each of these configurations that were studied and my understanding is that that case 2 corresponds to the approximate configuration that would be through that area, that section of the proposed line.

Q Okay. And then case 2, was that your understanding of the Peoples Road area?

A Correct.

Q Let's move on to the drawing for case No. 4. What does this show in terms of the magnetic field?

A This one also, I believe, shows that the proposed line, the peak of the proposed line in this one at the time of the cut-in, the assumed loading of 20 MVA on the 138 kV line would be below the average of the existing 23 -- with the 23 kV subtransmission circuit in place.

Q Okay. And it actually looks as if the peak on the 138 would be below the average for the current line in places; is that correct?

A Right. That's correct. As you move out, you can see that it does -- the 138 kV peak would be higher than the average moving out to the side slightly, but as I said, because they fall off rapidly, the difference between the curves goes down fairly fast.

Q Finally, let's look at your case No. 5. This seems to show an even greater difference between the magnetic fields on the existing line and the lower magnetic fields on the proposed line; is this correct?

A Yes. Case 5 is -- I would say has the most distribution circuits on it of all the configurations that we looked at to the extent that it looks like the magnetic fields are almost predominantly from the distribution circuits themselves, although you have a contribution from the subtransmission and that's why you get the decrease when

you put the 138 in, because you're providing the same power at a lower current.

Q You said that these were all based upon the current at the time of cut-in. Did you also calculate future possible loads on this line?

A Yes. Based on information from Duquesne Light engineers like Homer Zucconi, the ultimate capacity of the line -- or the ultimate capacity I guess of the substation would be 30 MVA and 20 MVA is the estimated load at the time of the cut-in that would be received by this line, by the new 138 kV line.

So, what I did was I increased the 138 kV to represent the ultimate possible load condition for this line and I prepared three graphs where I had two of the graphs that represent the calculations for case 2 and they basically are showing two different types of information in two different ways in order that I didn't have too many traces on the curve.

Q Now, did you happen to bring extra copies of those graphs that you can provide?

A Yes, I did. Would you like to distribute those?

Q Yes.

A I'll need to annotate them if we're going to -- I also ran the calculations --

Q Actually she needs two copies and then the other

participants each need one.

JUDGE NENE: These are going to have --

MR. NYPAVER: These are all different?

THE WITNESS: There are three different graphs.

MS. SESTAK: Your Honor, I ask that these three graphs be labeled Exhibit DWF 3.

MR. JANOSKO: Do we already have these graphs available in your prior testimony?

THE WITNESS: No. No. These are 30 MVA calculations.

JUDGE NENE: They will be marked DWF 3, but we need some sort of attachment for the Court Reporter's set. Do you have a couple paper clips?

MS. SESTAK: I don't know that I do on me.

(Thereupon, the document was marked as DWF Exhibit 3 for identification).

A (Continuing) What you'll see is there are two graphs for case 2 and only one graph for case 5. The very first one should have only three traces for case 2. Basically what you'll see on this first graph, three traces for case 2 is you'll see the existing magnetic field calculations for the 23 kV line for the case 2 configuration, that's the dark, the squares, and then the red line is proposed with

peak currents for 20 MVA, which was the original calculation that's in the graph. That's the expected load at the time of cut-in, and then the 30 MVA, it shows the ultimate magnetic field at the maximum capacity of the substation and so what you see, the difference between the red to the green, represents how the magnetic fields would potentially increase over the years that it takes to get to the 30 MVA.

Now, my understanding is that this is a decades long process to get to the 30 MVA. It represents a 50 percent increase over the load, what it would be at the time of the cut-in. I think some projections for load growth are on the order of one percent. If that's the case, its going to take many, multiple decades, three, four decades to get there, compounded to that 50 percent increase.

Then when you go to the second graph, it basically just compares the existing peak and average with the 30 MVA peak and average just so you can see. The peak magnetic fields obviously represents a maximum magnetic field that would only occur for a very short period of time. So, in this graph you get a better feel for the comparison of average to average, which is a more typical number for the magnetic fields.

You can see that in this second graph the peaks are nearly identical, but as you go out to the side, you have a slightly higher magnetic field, but there again because the

field levels fall off, the differences are not that great as you go out.

Finally the third graph I did the calculations for case 5 along Thompson Run Road and this is where all the distribution is there. What you actually have here is what I started to say when I was discussing this configuration, is that there are so many distribution circuits here and because of the loads they carry, that when you increase the 138 kV line you see virtually no increase in the magnetic field.

Some, this is a unique situation in the sense that if the distribution lines are heavily loaded, then the increase in the current on the 138 kV line have a minimal impact to the resulting magnetic fields for the new proposed line.

I drew a trace at the very bottom which says 138 kV only 30 MVA so that you could see in comparison if you had that all by itself, with no other distribution circuits, what the levels would be so that you can see the impact of the distribution circuits in the distance from the dashed line at the bottom to the square line that represents the existing with peak currents at the top.

That's my full explanation unless there are questions on those, but that gives an overall picture of what the magnetic -- what the magnetic fields can do ultimately over the course of decades as opposed to just what is the impact

now in going from this to this.

Q Let me just take a very quick look at my notes from the testimony at the public input hearings to determine whether anything else was --

JUDGE NENE: While you do that I'm going to get some paper clips because they have to be kept in order. Off the Record for a second.

(Discussion off the Record).

JUDGE NENE: Are you ready, Ms. Sestak?

MS. SESTAK: Yes, Your Honor.

BY MS. SESTAK:

Q Mr. Fugate, a question was asked at the public input hearing concerning the safety of medical devices and field interference with medical devices. Could you please address that very briefly. I believe you did address that in your written testimony.

A Yes. In the written testimony I basically start out by saying that interference is something that I think anyone who gets an implant discusses this with their physician and the manufacturer normally has specific instructions on things to avoid, things not to do, places not to go or be near and its really on a case by case basis, that that should be the overruling input on whether or not a person should be underneath a power line or near something like a drill or something that would have electromagnetic output.

But the one thing I can say is that there are guidelines from a group, the ACGIH, American Governmental Hygienists --

MR. BALIK: American Congress for Hygienists.

THE WITNESS: Thank you.

A (Continuing) They do have guidelines for implant devices and the guidelines are 1,000 milligauss for magnetic field and one kilovolts per meter for electric field.

Basically all I can say for the calculations here, we're well under those limits for those type of devices. But that's not to say that there wouldn't be special cases.

Q You used the term --

A Milligauss, m-i-l-l-i-g-a-u-s-s.

Q Are the field values in milligauss shown on the charts we reviewed here?

A Yes, that's correct. Technically a gauss is a unit of magnetic flux density. We typically talk about -- which is referred to as a symbol B, capital B, but its become common usage for people to talk about magnetic fields which generally engineering people talk about magnetic field strengths as H, but we have come to use unit of milligauss with magnetic field, we just call it magnetic field.

Q Are these the values shown down the left-hand column?

A That's correct, on all the magnetic field plots. Where I say magnet fields, its in units of milligauss, which

has a small m capital G.

Q And in terms of the public input hearing, you had just mentioned something about being near an electric drill. Do electrical appliances generate fields?

A Yeah. Anything that uses electricity generally creates electric and magnetic fields of varying amounts, just depending on the amount of current and the voltage that it operates at. Just as you have different electric and magnetic fields off power lines in various configurations, depending on the appliance, you can have various levels.

The major difference between a power line and a small appliance in terms of the spacial characteristics would be that the fields expend much further for something as large as a power line whereas with an appliance you can have extremely intense magnetic fields typically at a close proximity, but it falls off very, very fast moving away from it.

Q I believe somebody at the public input hearing said that putting a line like this in front of homes would be like standing in front of the television and a toaster.

Do you have any opinion on that?

A Really all you could say would be that adjacent -- if you stood next to a toaster, I'm sure there's a point at which the magnetic field magnitude would be similar to the magnitude from the power line, although it would be a very

small region and other than that, there's really not much to say except that the sources are totally different in terms of their spacial characteristics and, you know, how fast the intensities fall off.

Q Okay. One final question. Could the level of the magnetic fields that you have calculated under average loading conditions directly under the proposed line be also produced by a distribution line as well as a transmission line?

A Oh, yes. In some cases distribution lines would create higher magnetic fields. You see something of that in case 5 where there are a number of distribution circuits there and that's mainly because the magnetic -- its because the magnetic fields depend on the load currents and have nothing to do with the voltage of the line.

You could have a heavily load distribution line that would create huge magnetic fields and you could have a high voltage of 500,000, a 765,000 volt line that would produce almost no magnetic fields if it was lightly loaded.

MS. SESTAK: Thank you.

JUDGE NENE: On your Exhibit that you introduced today, what does the 30 MVA stand for?

THE WITNESS: That represents the amount of load current. Its megavolt ampere and its representative of the load being serviced by the substation and they talked a

little bit earlier today about calculating -- at the time of the cut-in, the estimated load would be 20 MVA on the substation. If you wanted to take that 20 MVA and back out a current that would be flowing on the line, you would use the 138,000 volts because the power -- that's representative of the power voltage times the current. So you would divide by the voltage and there's also a factor of a square root three because its a three phase circuit. That would give you the current flowing on the line.

So, the thing that's different about these additional grafts compared to the ones in the report is that they were done based on 20 MVA for the load and that's the estimate load at the time of the cut-in when the line goes into service, whereas these are an attempt to say what the magnetic fields would be when the ultimate capacity of the substation is reached decades from now and that's the 30 MVA number, which is the size of the transformer. That's the most it could go for transmitting power up to that substation.

JUDGE NENE: And the transformer could be upgraded too, couldn't it?

THE WITNESS: That's an engineering issue, whether or not.

JUDGE NENE: Okay.

THE WITNESS: It would depend on the

transmission line design as well, would be my understanding. In other words, what conductors are already run.

JUDGE NENE: I see. All right. Are you ready for some questions from the audience?

THE WITNESS: Sure. Sure.

JUDGE NENE: Mr. Nypaver.

MR. NYPAVER: I would like to -- right now Mr. Janosko has to leave, so I would like to defer to him.

JUDGE NENE: Mr. Janosko.

MR. JANOSKO: Is it all right if I ask my questions first?

JUDGE NENE: You may proceed.

MR. JANOSKO: I'm under some time constraints. Thank you. I appreciate that.

CROSS-EXAMINATION

BY MR. JANOSKO:

Q Doctor, just a few questions. When you generated these graph 3 forecasts, were they estimates or all valuations?

A They're both in the report where it says case 1 and case 2, the first part of the report they are all calculated.

Q They are also based on calculated values, not actual measured values in case 2?

A That's right. If you go to the report, the section

2, electric and magnetic field calculations, those are all calculations.

Q That also holds for case 3 graphs, case 4 graphs and case 5 graphs?

A Correct. When you get to section 3, EMF measurements, then what we have are -- we attempted to take measurements at two locations and compare them with calculations as a rough check to make sure we're in the ball park on the calculations.

Q I see.

A So, that is correct, everything, everything in section 2 is calculated. There is absolutely nothing that was measured.

Q So there was actually some actual field measurements?

A Yes.

Q When you generated your data for your testimony there was some --

A In this report we described where we did two sets of measurements, one crossing Peebles Road and one on Thompson Run Road.

Q Okay. In preparation for your testimony, did you perform any actual measurements of electrical or magnetic fields or any -- on any similar high voltage lines, meaning 138 kilovolt lines in Duquesne Light's system?

A No. Not for this. That's correct.

Q Why haven't you? They're there, aren't they?
A Yes. We have done a lot of electric and magnetic field stuff and in terms of studies, calculations, measurements and its fairly straightforward if you're not looking -- if you're looking for representative.
Q But no actual 138 kV lines were measured?
A That's right, not for this.
Q So calculated is better than actual lines when they're available, measuring electrical fields?
A The calculations are representative of the proposed line as its going to be constructed and there's no reason to believe its not a good number.
Q How do we know? Nothing has been checked. In actual practice we have 138 kilovolt lines already in Duquesne Light's system, but you have just testified that in preparation for your testimony you have not measured any actual fields, everything is based on a calculated value and as you mention in your report, actual values may be higher or lower than they are when they're calculated; is that true?

MS. SESTAK: Objection, Your Honor. The testimony -- or the question misstates the testimony. In fact, Mr. Fugate testified that he had measured the actuals at two locations and that he had measured fields at other locations not directly related to this study.

Is that correct, Mr. Fugate?

THE WITNESS: That's correct.

MR. JANOSKO: Your Honor, Dr. Fugate said when he measured these fields they were not from any actual 138 kV lines in Duquesne Light's system. That was my question.

A That's correct. And what I would say is that we do studies -- tell me when you're ready.

Q I'm ready. I'm ready. Go ahead.

A When we do studies we do measurements and calculations all the time on all sorts of things and your question is basically saying that you don't believe that the 138 kV calculations are accurate and that's just not the case.

Q I'm not saying that. I'm saying that we have -- there's not been any actual --

JUDGE NENE: You have established that and you can argue that later, but the facts have been established and he answered the question.

MR. JANOSKO: Okay.

BY MR. JANOSKO:

Q Have you ever used an electrical drill?

A Yes.

Q How long did you use it?

A I use electric drills all the time.

Q But for each time you used it how long did you use

it; are you using it for several minutes, several hours of continuous exposure?

A For brief periods of time, certainly like anyone would use a drill.

Q Okay. So you think your drill use is pretty representative of actual drill use by the average individual?

A Yes, I'm your average drill user, absolutely.

Q So when you use an electrical drill you're only exposed for a few minutes, maybe even a few seconds of actual electrical field or actually I'm sorry, I -- let me rephrase the question, please.

You're actually exposed to magnetic fields for a few seconds or maybe a few minutes at a time?

A Brief periods of time, yes.

Q Okay. If your home was close to an -- a high voltage line, how much time do you spend in your home on average, per day?

A Probably depends on the person.

Q I'm asking you, because you can't comment on other people.

A Yes. Right. 12 hours.

Q Okay. So that's 12 hours of potential exposure if you are close to a 138 kV line or any kind of other high voltage line?

A Yes. Define exposure for me.
Q Well, I mean if you're living in close proximity to a high voltage line or any kind of electrical line, as you mentioned in your studies, there is a calculated value --
A Of magnetic fields.
Q -- of magnetic fields or electric fields that you are exposed to, both?
A I think the thing you can see, no matter where you are in any building you're going to be in magnetic and electric fields. That's why I was kind of asking about exposure, because --
Q I understand, but that's also personal choice of the individual that you have --
A We operate all the time in magnetic and electric fields. All the time.
Q Sorry.
A But you're correct, you would be in a magnetic field if your house was near a power line. That may or may not be dominate from that power line.
JUDGE NENE: Keep your voice up a little bit.
THE WITNESS: Okay. Sorry.
BY MR. JANOSKO:
Q Do you have any young kids?
A No.
Q Well, I have young kids and I will say that young

children are generally in a house longer than an adult, they may even be there for 20 to 24 hours a day at times.

MS. SESTAK: Objection, Your Honor. I believe this witness is testifying rather than asking questions.

JUDGE NENE: You're testifying. This is Cross-Examination.

MR. JANOSKO: Sure. I understand. I'll -- that's the end of my questioning then. Thank you.

JUDGE NENE: Thank you.

MR. JANOSKO: Thank you, Dr. Fugate.

MR. NYPAVER: The first question was already proposed by Mark because it was basically a controlled versus an uncontrolled, sit in your home you're in a controlled situation. When you're anywhere else, you're in a controlled situation.

JUDGE NENE: The witness said when you're in your home, but you are probably subjected to this when you are out of your home.

MR. NYPAVER: But its not right in the vicinity. If you look at all his readings, most of his readings taper off.

JUDGE NENE: You can ask the questions.

CROSS-EXAMINATION

BY MR. NYPAVER:

Q When you did these readings -- let's just take the

ones.

A The measurements?

Q On you said Windy Oak Ridge?

A Yes, across Peebles.

Q How far below the lines are you when you did the measurements?

A The profile basically starts at the -- I guess it would be the North Side of Peebles and went across the road and went underneath the line and then continued out something about 200 feet.

Q So every time you took a foot step you may be right underneath the line, you may be 30 feet out, you take a footstep you would be 31?

A Are you talking distance to the phase conductor?

Q Yes.

A Or to the center line?

Q Center line. Let's base it on center line.

A Yes. The way I took the measurements is with the profile wheel. We have a sensor and the profile -- we will measure off in five ticks and record a sample and I believe what is here is every five feet there's one reading, so that that gives you a general idea of the spacial characteristics of the magnetic or the electric fields moving across under the line and then it also gives you an idea of how it falls off.

Q That is correct. That is if every time you're taking a step you are getting the center line here 30 feet high, you take a step out, you are actually increasing your radius?

A You're talking about the distance to the -- geometric center of the phase?

Q Yes.

A The area when you move out from the side, the actual distance from the phase conductors hardly changes at all.

Q Correct.

A Until you get out far enough relative to the height of the phase conductors, at which point the distance from the center line dominates and that's essentially the distance from the phrase conductor.

Q I guess another way of saying this, you have a center line here of phase conductors and would you say equal circles around each radius for all the EMFs?

A If you plotted contours of equal magnitude going around, it would be somewhat circular. It would have a weird shape based on the configuration of the conductors, like the shape of the contours around the 138 design would be different from the contours of the distribution circuits like where we did them here.

Q If we use the existing 23 kV line -- and I'll pick Shady Oaks Circle -- if I'm directly underneath the line and

the line is 30 feet away and I walk 30 feet or 20 feet to the house, I am 20 feet away from the center line as far as grade level goes, but the house is two stories high.

A Right.

Q So the house is 30 feet high at this point in time. Would you say the possibility exists that by being in your house at a second story floor next to the floor you would actually be closer to the line than if you were at the center underneath it directly?

A Yes.

Q Obviously your readings don't show that.

A No. We did an evaluation at a constant height moving along.

Q Okay.

A A typical way to characterize a standard design is according to measurements, there's an IEEE standard for measurements beneath electric power lines and they generally refer to lateral profile with accessory height one meter above ground. That's fairly common, too.

Q I figured it was one meter.

A You are absolutely correct. Depending on the height relative -- that's the thing I was trying to say about when you're doing the calculations, certainly the topography changes, there's conductor sag. Its only meant to be representative.

Q You basically said the numbers could be higher inside of your house than they are underneath the line.
A The magnetic fields could be higher.
Q Okay.
A In a situation where moving up your closer to the phase conductors, it certainly could increase.
Q Now, the other thing on your studies, the center line of your phase conductors, when you did the study on any of the questions, let just pick Shady Oaks Circle, case 2. Where would you consider the center line of the --
A The pole, the pole line.
Q I guess the question would be -- is how high -- you have three phases and they are staggered. Would you still consider the pole the same?
A Are you talking about 138 kV?
Q I'm talking about 138 kV, yes.
A All the distances and the rate of the calculations are relative to the site of the pole. For example, when you look at figure 4 on page 5, if you look at the right side you see 138 kV configuration and the phases are arranged A and C on the left side and phases B on the right side and so if I were going to model that, I would assume my pole center line was zero and because it shows a five foot dimension, then A and C would have an X coordinate of minus five and the B phase would have a plus.

Q You accommodate for the height of the phases, too?
A They're built into the model.
Q Okay.
A Because if -- actually, one of the key characteristics that you're looking at in doing the model like this is the conductor sag, because as you move along from structure to structure, the conductors actually have a certain amount of sag and so the engineers at GAI and Duquesne Light, what they do is they look at a typical span, the length of the span and how much the conductor would sag and the actual height then for each of the conductors that's put in is not the height of the conductors on the pole, its the height near mid span where it would be sagging a little bit lower.

Of course, if you were to look at the magnetic field going parallel to the line, then as you get closer to the structure oftentimes the magnetic and the electric fields would decrease as you come in closer to the pole because the conductors are going up and away, but that's not always the case, depending on again the topography.

Q In your field -- all of your studies show at 100 feet it really tapers off quite a bit.
A (Witness nods head in the affirmative).
Q So a hundred feet, being a hundred feet away from the line, provided you're not in a second story floor, it

basically tapers off?

A At a hundred feet the second story is not going to make that much of a difference. I would agree at 25 feet, absolutely, you know, it could have a significant change, but again it just depends on how far you are out relative to the height of the conductors.

Q Also, if you notice, the pole heights are 45 and 50 feet for the 23 kV lines and now they are 75 -- 70 and 75 feet above grade for the other two lines.

A Right.

Q So they are basically 150 percent of the exiting pole line?

A Right. In terms of magnetic fields what you have and what you see in the calculations is that because there's lower current, the magnetic fields are generally going down when you compare it to the 138 kV line.

However -- and part of that is because its at lower currents, but its also because the conductors are generally higher, but what you have is an increase phase to phase spacing which also would tend to increase the magnetic field. On a per ampere basis the 138 configuration may produce a slightly higher magnetic field and I think you see that in my 30 MVA calculation.

As you go out to the sides -- when you are right underneath the line, because of its height, the peak is

nearly identical to the exiting, but as you move out to the sides, you do see a slight increase over the existing configuration.

Q Basically you can say that because of the height of the pole is probably why the ratings are reduced?

A Its a combination of the height of the pole plus the low current at the higher voltage.

MR. NYPAVER: That's all for me.

JUDGE NENE: Thank you. Mrs. Nypaver?

MS. NYPAVER: I have no further questions.

JUDGE NENE: Mr. Kalinski.

MR. KALINSKI: I have a few questions and I will try to speak slowly.

CROSS-EXAMINATION

BY MR. KALINSKI:

Q The first question refers to the use of the word under the assumption. You mentioned in your written Deposition and what you mentioned before that the levels of electromagnetic fields are not going to be different or will be reduced under the assumption, okay, that the peak load will be 20 MVA and that's based on the projected growth of meeting the current area and the capacity of the -- at the substation. What we had from Mr. Zucconi earlier today is, however, that upgrade line by itself can carry as much as 200 MVA, which would be not 53 amps, as used, okay, in your

electric magnetic fields, but will come up to 138 kV -- I'm sorry, it will go up to 158 amps, okay, if I recall.

Can you tell us if in such hypothetical case -- because I think sooner or later there is a chance that that substation will be upgraded, this new line will reach its full capacity, which means 20 MVA and 158 amps, which is basically ten times higher than the load and three times higher current -- than the one you used in your estimates.

How much will the levels of electromagnetical fields be increased?

A If I could first try and clarify, just to make sure you and I are talking the same language. The calculations are based on information from the Duquesne Light system engineers based on projections that at the time that the new line goes into service it will be loaded -- that the peak load would be approximately 20 MVA.

Q Right. Right.

A Okay. Then based further on what they're saying about plans for the substation, the transformer that will be installed will have the capacity for 30 MVA.

Q Right.

A And so is your question what's the increase in magnetic fields in going from 20 MVA to 30 MVA?

Q To 200 MVA.

A To 200 MVA?

JUDGE NENE: Okay. I think he has the question.

A (Continuing) Yes. Certainly the issue of whether it would ever be 200 mva is Duquesne Light's issue. Its a factor of ten.

Q Right.

A In going from 20 MVA to 200 MVA, if you wanted to know the magnetic field for the same operating voltage, it would be a factor of ten.

Q Of ten?

A Yes.

Q So in this case, basically after all of the figures and all of the figures on your Exhibits case 2, 3, 4 --

A If I want --

Q -- this line would go somewhere here?

A I could label every one of these graphs 200 MVA and make new ones just by multiplying each of the numbers on the traces by a factor of ten.

Q Right. Do you agree that the fact remains that there is no way that this amount of energy can go through the existing 23 kilovolt line, it will melt probably?

A Oh, yes.

Q It is possible you have --

JUDGE NENE: You are going too fast. I don't understand you and I don't know whether the Court Reporter

does either.

BY MR. KALINSKI:

Q So is it true that talking about 200 MVA and 158 amps cannot be transmitted on the existing line?

A No. I think its way over 150 amps.

Q Right.

A But I think the question that you're asking is could 20 MVA or 30 MVA be transmitted on the 23 kV line.

Q I'm asking 200 mva. I think it cannot. You agree with that?

A That's just opinion.

Q Right. Okay.

A Because I know nothing about the actual conductors on the line.

Q Right.

A So I wouldn't know what power it could transmit.

Q But did I get you right that, okay, you just said if this newly proposed transmission line will reach its full capacity, which is 200 MVA, the levels of electromagnetic fields will increase by ten fold?

A I don't know that that is its full capacity based on the input I'm getting from Duquesne Light.

Q Based on what we heard this line is capable of 200 MVA?

A All I can say is --

MS. SESTAK: Objection, Your Honor. I believe the witness is misstating the testimony. He is apparently referring to a portion --

JUDGE NENE: The witness?

MS. SESTAK: I'm sorry, Mr. Kalinski. I apologize.

He's apparently referring to a portion of Mr. Zucconi's testimony in which he said he wasn't sure how much the 138 kilovolt line could carry because he didn't know what type of line was going to be installed and to extrapolate from that to mean that 200 megavolts of power is going to flow across that line in the foreseeable feature makes no sense whatsoever and it completely misstates the evidence of Record.

MR. KALINSKI: Can we clarify this. Is it possible?

JUDGE NENE: Well --

MR. ZUCCONI: I have to refer to my testimony, if she allows me to speak or not.

JUDGE NENE: Is it in your written testimony?

MR. ZUCCONI: Yes.

JUDGE NENE: All right, Mr. Zucconi, you're still under oath.

MR. ZUCCONI: Yes, I'm.

JUDGE NENE: Would you restate your testimony

concerning that.

MR. ZUCCONI: The question was asked of me what a typical transmission line was good for. In the ring system that I showed you before, those transmissions are rated at 200 MVA. Okay. Its not accurate to say that the transmission line that's tapped up to Wildwood Substation is also going to be carrying 200 MVA. I don't know what size conductors our transmission engineers are going to install.

The substation itself is only capable of supplying 30 mva of load to the area because of the transformers we are installing there. One transformer is a 1824, 30 MVA transformer. That's based on the fan ratings and what have you. The fan rating is the highest 30 MVA.

JUDGE NENE: We don't want to confuse the transcript. Is that adequate for your discussion here?

MR. KALINSKI: That's what I'm --

THE WITNESS: What he is doing is putting forth a hypothetical and he's saying what would the magnetic fields be if the 138 kV line transported 200 MVA and I think that the real issue is whether or not that's realistic in terms of the planned transmission line that's being proposed here.

JUDGE NENE: And I think that its not.

THE WITNESS: And I'm hearing 30 MVA --

MR. ZUCCONI: That's correct.

THE WITNESS: -- is a number that would be reached decades from now based on input from Duquesne Light.

JUDGE NENE: Let's work with that, Mr. Kalinski.

MR. KALINSKI: Okay. In this case I would like to move on.

BY MR. KALINSKI:

Q Can you explain it to me, why is it so that although higher voltage transmission lines carry less electromagnetic fields why environmental impact assessment is required in case of the projected construction of 138 kV lines but its not required in case of construction of 23 kilovolt line?

A I have -- I'm not an expert in terms of environmental impact. My expertise is in measurement and calculation type studies of what would be seen in these types of lines, so I'm not familiar with the regulations or the rationale of the policies.

Q It just struck me that perhaps are there any other types of impact -- in this last regard why all of your graphs again show 20 MVA loads that maybe reduced level of magnetic fields. All of the bottom part show dramatically increased electric field and then in the last part of your statement on page 7, okay, you make the statement that those higher levels of the electric field would not become an issue because they would be blocked by the existing shrubs,

trees and buildings.

How does it fit --

MR. KALINSKI: Your Honor, may I approach the display items by the windows? I would like to use my finger.

JUDGE NENE: Yes, you may.

BY MR. KALINSKI:

Q (Continuing) so in this last regard that is basically a picture of my street, basically here are neighbors directly underneath the line. There is nothing to screen them from this 178 kilovolt line. They are waiting for the school buses to come and school buses are waiting sometimes for them loaded with kids, they stop in this spot in this spot and in few other spots on the -- along Ringeisen. I believe -- I assume it may be similar in other streets.

A Yes.

Q Can you also tell us what do you mean -- what will shield those kids from those high electric fields?

A Yes. Let me clarify the statement in the report. Let me just start with in our business of electric and magnetic fields, electromagnetic fields, one of the main things we deal with is interference and the most common interference is with magnetic fields, almost never with electric fields, and the reason you typically have magnetic fields interfere is because -- never electric -- is because

electric fields are very easily shielded, they are protected by nearly everything and that's kind of what I was saying, that even trees and buildings and so forth affect the electric fields.

I did not mean to imply that directly beneath the line in an open area that the electric field would be significantly different from what -- its possible.

Q I understand.

A Its possible it could be, for example, in against the pole there the electric field would be slightly different than if you were standing ten feet away from it.

However, the point I was making was that once you are behind the trees or inside your house in general, the electric fields are much less than would be outside if the building or those trees weren't there just because nearly all things provide some shielding of the electric field.

The magnetic fields are different in that nearly nothing in general affects them except for ferromagnetic materials and large metallic objects possibly and they're more difficult to shield and that's why in a sense I was projecting my experience with interference issues in terms of sensitive instrumentation or equipment almost always is affected by magnetic fields but never electric fields. Generally electric fields are relatively easy to reduce or attenuate.

Q So would this tree shield against, okay, this high level electric field and everyone behind it?

A The thing you could say is certainly in against that tree you would see almost no electric fields because the electric field lines would tend to go to the top. When you make electric field measurements, the standards say you have to hold the sensor out approximately a distance of three meters away from your body because your body perturbs the electric field itself. If you held the sensor near your head underneath the line, you would read an incredibly high electric field, whereas if you held it in front of your chest, you would -- it would be much reduced, shielded electric field.

Q I understand.

A So, in order to compare the electric fields from transmission lines in a consistent repeatable manner, you have to hold the sensor way out away and then part of that is not making measurements in under the trees because its not meaningful, it is shielded.

Q Does that mean, if I understand correctly, as proposed by Duquesne Light removal of the trees will remove the shielding affect?

A The impact is going to depend on where you are relative to the trees and where the trees are relative to the line.

MR. KALINSKI: I have another set, basically two quick questions.

BY MR. KALINSKI:

Q You mentioned in your analysis, Dr. Fugate, that the levels of noise created by --

A Electromagnetic noise.

Q Right. Will be 23 and 28 decibel, which is comparable to the level of noise in the bedroom, that was the statement which I think I recall.

A Audible noise.

Q Audible noise.

A Due to corona.

Q Yes.

A Just to explain so everyone is on the same page with you, corona is a small arcing at the conductor surfaces where the electric fields are very high and its most noticeable on high voltage -- higher voltage lines, meaning like 500,000 volts and higher. Its a hum that would be -- you would hear it quite possibly and his question -- we did calculations. His question relates to the calculations that we did just as an evaluation of the audible noise that would be associated with operating this type of line.

Q Okay. Is it possible that its not only the magnitude of the noise but the character of the noise that maybe perceived by people as more or less pleasant?

A Absolutely. Audible noise is an extremely subjective issue with most people and, in fact, the reason when they characterize audible noise -- its like magnetic fields in the sense that one value isn't the threshold between caring and not caring. Its whether a person complains or not and they do statistics on audible noise generally about which level, you know, a certain percentage of people would complain at a certain audible noise level.

MR. KALINSKI: Thank you. Thank you, Your Honor.

JUDGE NENE: Thank you. Mr. Lapets?

MR. LAPETS: Yes.

CROSS-EXAMINATION

BY MR. LAPETS:

Q The question is did you assess the combined affect of 138 kilovolt line and 23 kilovolt line being located on the same poles?

A When we did our electric and magnetic field calculations, we incorporated a cross-section of the lines which would include both the 138 and the 23 kV and any other pertinent lines. I think -- I'm trying to remember if there was even 4 kV on one of them or not.

But basically we included all of the lines that would be there in a two dimensional cross-section when we did our calculations. The net result is kind of along the lines of

what you would expect. Of course, the different voltages and the different conductors at different locations will impact the overall field structure of the electric field and the magnetic field, if they were looked at individually.

But to answer your question, yes, we did incorporate the distribution lines and the 138 kV lines in our calculations. The field value -- the fields, the electric fields and the magnetic fields, are vectors and so they have a direction associated with them and especially when you talk about magnetic fields, its possible that the magnetic fields from a distribution line may actually tend to be in the opposite direction, depending on the phasing, and so forth of 138 kV line, that its possible that the combination of the two would reduce the field at this point out here. As opposed to them adding, they may subtract, but the simplest thing to say is that if one creates a certain field here and the other creates a certain field here, you just don't add them to get the total effect.

Q I understand two vectors you don't add value, you add vectors.

A Yes.

Q That's fine. That's the answer, but I would like to just have a little comment here that the affect could be total increase of all of them, electric field, magnetic field or in some cases even decrease, but in general you

could expect an increase?
A When you have multiple circuits?
Q Right.
A Correct. That's why we did the calculation with all of them present.
Q Right.
A In order to compare the existing situation with the proposed.
MR. LAPETS: Okay.
JUDGE NENE: Ms. Zaun, do you have any questions?
MS. ZAUN: I do.
CROSS-EXAMINATION
BY MS. ZAUN:
Q My question ties in with the question you answered for Mr. Nypaver when he was asking you about distance of homes from the center line.
A Right.
Q Then he also asked about if one were in a second story bedroom, for example, and, you know, you did say clearly that as one goes away from the line, certainly after 100 feet its rather negligible, hardly a difference, I think was your wording.
A Right.
Q Then I think you answered him that if the home were

25 feet away and then in an upper story -- in the second story room there would be a noticeable difference?

A Right. There could be an increase in the magnetic field if you were moving closer to the center.

Q Okay. I have some questions and the first is that many of the homes -- several of the homes are 40 feet away from the line and they are two story homes. What would be your opinion of the increase in magnetic level 40 feet away but being upstairs; would there be also a noticeable increase in the magnetic fields?

A I think there would be an increase. As to it being, you know -- its kind of guessing at this point without running some numbers. I would guess that at a distance of 40 feet, moving up 20 feet, you know, you can see a possibly 10, 20 percent increase. I don't know if you would see something more than that.

Q Okay.

A The simple thing to do is to run the numbers.

Q Also I want you to envision this -- because I think both of our questions are assuming that the road is flat and the pole and the house begin at the same point. There are some homes on the proposed line that already sit up, the pole is installed at road level. The house sits up already the equivalent of at least one story.

A Right.

Q Then you have a two story home. So, with the current lines that are there, looking out of one's bedroom basically at the top or over the line, if there is a home 25 feet from the pole -- and I'm saying that because I know of one in particular that is very close -- the pole is at ground level, the house begins up above and then it is a two story house.

What are your feelings on the increase there; would it be then, in fact, up to three stories at least?

A Again, its difficult to say without doing the calculation.

Q It would be an increase?

A It would be just a matter of where the house is relative to the phase conductors, the lateral distance plus the vertical height.

Q But as one goes up, keeping the same distance away, it certainly does increase, you can't say how much, but there would be --

A Right. You're describing a situation -- you are getting closer to the geometric center of phase conductors.

JUDGE NENE: Okay.

MS. ZAUN: Okay.

BY MS. ZAUN:

Q Just a second question is, are you familiar with the term prudent avoidance?

A I have heard it. I'm not a health expert.
Q Okay.
A The next person.
MS. ZAUN: Thank you.
JUDGE NENE: Mr. Krist?
MR. KRIST: No questions.
JUDGE NENE: Redirect?
MS. SESTAK: Yes. I would just like to clarify a few minor points.

REDIRECT EXAMINATION

BY MS. SESTAK:
Q Mr. Fugate, when you spoke about the possible 30 MVA scenario, was it your understanding that that's really -- if somebody thinks of an increase in the flow on this line as bad, that would be the worst case scenario possible with the proposed substation?
A My understanding is that it would be a worst case and not even in the sense of a typical load, that would be the worst case for a very brief period of time during the year under the heaviest load conditions, if that makes sense.
Q I think so.
A In other words, 30 MVA is -- in the ultimate capacity, my understanding, is that the line would be operated, not what it would run at that like around the clock. It would be the load that it would serve for a very

brief period of time and then back off of that would give you a typical average, and in the plots I show an average result which is based on the fact that when you're at a peak, you're at 30 MVA, but the average is a more typical number throughout the year.

Q Okay. And there's been talk about clarifying the problem with people who are closer to the line by being on the second floor of a home and yet in your charting, your calculations indicate that the magnetic fields would fall below the present levels upon installation of the 138 kV line.

Would somebody in a second floor be likely to also experience a diminution in the field from what it presently is with the installation of the 138 kV line?

A The affect would be -- I mean, you can't make the statement that because we're talking about a second story that 138 kV line necessarily would increase the magnetic field there, but not at a lower level. The vertical height would be also -- you would need to look to see where it was relative to the 23 kV.

So the net result would be the 23 kV lines are slightly lower, so just depending on where the house was in relation to that, in general, you would expect the magnetic fields to go down with the 138 kV line unless it was a situation where the height the conductors were installed at

on the pole moved them closer to a point in the house there could be a slight increase or no change at the time of the cut-in. But you also have, with the height they were mentioning, you also have to consider its already at a certain vertical height with respect to the house and the 138 kV phase conductors are going to be slightly higher.

Therefore, there most likely, at a certain position, would be a decrease in magnetic field. It could increase slightly. In general, though, I wouldn't expect an acceptable or close case to be much change at all, more likely a decrease.

JUDGE NENE: The shield factor will still be a part of that?

THE WITNESS: The shielding is only for the electric field component. There's no shielding affect from the house for the magnetic fields and so we have been focusing mainly on the magnetic field part.

MR. KALINSKI: Can I ask one clarifying question?

JUDGE NENE: If its responsive to the questions she asked on Redirect, yes.

RECROSS-EXAMINATION

BY MR. KALINSKI:

Q Again, the question about the 23 MCA or the 200 MVA, I understand the bottom line of your statement --

JUDGE NENE: I know you're excited but --

MR. KALINSKI: Because I think I have got a good question.

BY MR. KALINSKI:

Q Now, one piece of clarification, do I get right that you said, in fact, the total level of EMFs is directly proportional to the overall MV'S transmitted throughout the line?

A That's right, because operating voltage is constant and the MVA we're talking about is referring to the power so, therefore, constant voltage is directly proportional to the load current.

Q Did you hear the same statement that I heard at the beginning of the session that the main reason -- at least one of the reasons to run this 138 kV line is to increase the amount of power in the north suburbs of Pittsburgh? Is my conclusion right that the direct implication of the statement is that in the long run the overall level of EMF would be coming up, the energy transmitted would increased?

A No, because you have increased the voltage by a factor of six and so with the same power -- I mean, a simple way would be to say it, if I increased the power by more than a -- if I increased the power by a factor of six and kept the phase conduction the same, then the magnetic fields would be the same. That's not a simple way here. The

voltage is going up by a factor of six, we are changing the configuration of the phase conductors, moving them up.

I think on a per ampere basis it probably produces a little bit more magnetic fields out to the sides because of the height. It actually is much lower when you're in close where the fields are higher.

Q But talking about the current projection of 20, okay, would increase, okay, to 30 or to 40, it would mean overall increase in EMF's by 1.5 by two fold; right?

A From the 20 MVA assumption?

Q Right.

A That's correct.

MR. KALINSKI: Thank you.

JUDGE NENE: Don't do it.

MS. SESTAK: Okay.

JUDGE NENE: You can ask another question. Do you have -- do you want to straighten something out?

MS. SESTAK: The only thing I was just going to ask Mr. Fugate is if it isn't just as likely that the usage will go down in the future, but I don't think its necessary to ask that.

JUDGE NENE: Its all speculation.

MR. KALINSKI: Is it true that you are going to be acquired by another company and how do you know what will happen then?

JUDGE NENE: Thank you, Dr. Fugate. We've got three in and I think that's enough for today. We have an Allstar Game tonight and maybe we can avoid some traffic and I wonder if -- off the Record.

(Discussion off the Record).

JUDGE NENE: We will be in recess until 9:00 o'clock tomorrow morning.

(Thereupon, at 3:45 o'clock p.m., the Hearing was adjourned).

C E R T I F I C A T E

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.

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