ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:) AS 02-5
) (NPDES Adjusted Standard)
PETITION OF NOVEON, INC.,) (Not Consolidated)
FOR AN ADJUSTED STANDARD FROM)
35 ILL. ADM. CODE 304.122) Volume I

The following is the transcript of a hearing held in the above-entitled matter, taken stenographically by Gale G. Everhart, CSR-RPR, and Jennifer E. Johnson, CSR, RMR, CRR, notary publics within and for the Counties of Peoria and Tazewell and State of Illinois, before Bradley P. Halloran, Hearing Officer, at 122 North Prairie Street, Lacon, Illinois, on the 18th day of February, A.D. 2004, commencing at 9:05 a.m.

PRESENT:

HEARING TAKEN BEFORE:
ILLINOIS POLLUTION CONTROL BOARD
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Michael R. Corn
Anand Rao
Nicholas J. Melas
Alisa Liu
Chen H. Lin
William L. Goodfellow, Jr.
Linda M. Shaw
Kenneth J. Willings
Members of the public and press

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All exhibits were retained by Hearing Officer Halloran.

HEARING OFFICER HALLORAN: Thank you. Good morning. My name is Bradley Halloran. I am a hearing officer with the Illinois Pollution Control Board. I'm also assigned to this matter entitled Adjusted Standard 02-5. It's entitled In The Matter of Petitioner Noveon, Inc., for an Adjusted Standard From 35 Illinois Administrative Code 304.122. This hearing is continued from yesterday.

The petitioner was putting on his case in chief. I believed we finished with one witness at that time, Mr. Giffin. And I do want to note that it's my pleasure to announce that we have member Nick Melas here, and we have technical advisors Anand Rao and Alisa Liu. All three may or may not be asking questions during the hearing itself.

Again, we are going to run this hearing pursuant to section 104.400 to 104.428 under the Board's rules.

With that said, any preliminary motions, Mr. Kissel?

MR. KISSEL: No. We still have the issue of the transcript and the testimony from the permit appeal, but why don't we wait on that until we begin the testimony. We can always deal with that at some time. If that's

okay with Debbie?

MS. WILLIAMS: I did my homework. So I'm ready to talk about it any time.

HEARING OFFICER HALLORAN: Thank you very much, Ms. Williams.

MR. KISSEL: Why don't we go forward with the testimony so we can get that out of the way.

HEARING OFFICER HALLORAN: I guess, for the record, do you want to introduce yourselves again?

MR. KISSEL: My name is Richard Kissel of the law firm Gardner, Carton & Douglas. To my right is Mark Latham, also of that firm, and to my left is Sheila Deely, also of that firm. We represent Noveon, Inc.

HEARING OFFICER HALLORAN: Thank you.

MS. WILLIAMS: Good morning. I am Deborah Williams. I'm assistant counsel with the Illinois EPA. And I have with me again today Lorraine Robinson, my legal investigator, and Rick Pinneo, to my left, Environmental Protection engineer and serving as my technical advisor in this matter.

HEARING OFFICER HALLORAN: Thank you. And it looks like there might be one or two members of the public. Again, as I stated yesterday, the Board welcomes and, in fact, encourages public comment, anything that's

relevant to the matter at hand. So raise your hand or during a short break come up and talk to me and we can get you up in the chair and you can state your piece.

With that said, Mr. Kissel, you may proceed.

(Witness sworn.)

MR. KISSEL: Before beginning this testimony, Mr. Hearing Officer, he has pre-prepared testimony which we filed with the Board. And the question was raised yesterday as to whether we want him to read that testimony or put it in the record as though read and then, again, whatever additional questions we have and then cross-examination. I have no particular preference.

Obviously, not having him read the testimony saves the Board and the rest of the people time. We do have copies of his testimony available for review for those members of the public. My suggestion -- I'll just leave that as it is. I don't know how the IEPA feels about it or whatever.

HEARING OFFICER HALLORAN: Ms. Williams?

MS. WILLIAMS: I think primarily, like Mr. Kissel said, it's whatever is easier for the Board to process and what works for the members of the public present. I guess I think maybe it would be best to ask them whether

they prefer to be able to read the stuff when they go home or whether they want to hear it here today to help them provide their comments.

HEARING OFFICER HALLORAN: I think -- and, again, we want to accommodate the members of the public, but I have full confidence that they can read the written testimony. And unless I'm mistaken -- I guess I will ask the public. Anybody in the public have any thought one way or another if, in fact, Mr. Flippin and a few of the other witnesses sit up here and read verbatim what will be available to you shortly or just leaving the written testimony on a table you can pick it up and read it yourself? Would that be fine? Do I see any hands? Yes, sir?

AUDIENCE MEMBER: I would like to have a written copy.

HEARING OFFICER HALLORAN: Yes, sir?

AUDIENCE MEMBER: I would as well.

HEARING OFFICER HALLORAN: We have three written copies. So I guess, Mr. Kissel, we will just go ahead and leave copies of the prefiled written testimony. And then we will leave it at that and you can do your summary questioning of Mr. Flippin.

Yes, sir?

AUDIENCE MEMBER: Could we have the copies available now as the cross-examination takes place?

HEARING OFFICER HALLORAN: Sure.

MS. WILLIAMS: What about exhibits? Are exhibits included?

MS. DEELY: We don't have copies of all the exhibits, but we do have the testimony.

HEARING OFFICER HALLORAN: The exhibits will be at the Board office in Chicago. In fact, quite a few of them might be able to get online. It's just a page. I think they scan them.

T. HOUSTON FLIPPIN, P.E., DEE,

called as a witness, after being first duly sworn, was examined and testified upon his oath as follows:

DIRECT EXAMINATION

BY MR. KISSEL:

Q Would you identify yourself for the record, please?

A Yes. I'm Thomas Houston Flippin.

Q Mr. Flippin, I show you what has been marked as Petitioner's Exhibit -- what number are we on?

HEARING OFFICER HALLORAN: Number 7.

Q For Adjusted Standard 02-5, and ask you to tell me what that is.

A This is the written testimony which I have prepared.

Q Did you prepare that yourself?

A I did.

Q And is that a true and correct copy of the document you prepared?

A It is.

Q Can you verify that what is in there is true and correct?

A Yes, I can.

MR. KISSEL: I move the admission of the testimony, and I would like it included as though read.

HEARING OFFICER HALLORAN: Ms. Williams?

MS. WILLIAMS: I have no objection.

HEARING OFFICER HALLORAN: That is admitted and the record will so reflect that it is admitted into evidence as if so read.

Q Mr. Flippin, I ask you to identify this document which has been marked as Petitioner's Exhibit 8 in the Adjusted Standard 02-5.

A This is a copy of my resume which I have prepared.

Q Is that a true and correct copy?

A It is.

Q And is the information contained therein accurate, true and correct?

A It is.

MR. KISSEL: I move the admission of Exhibit 8.

HEARING OFFICER HALLORAN: Ms. Williams?

MS. WILLIAMS: We have no objection to that.

HEARING OFFICER HALLORAN: Exhibit Number 8 is admitted.

Q Mr. Flippin, I show you what has been marked as Petitioner's Exhibit 9 for the Adjusted Standard hearing 02-5. Would you please give a brief description of what that is?

A Be glad to. This is a collection of articles that came from a literature search dealing with the topic of mercaptobenziothiazole, also referred to in my testimony as MBT. And in this collection of articles what you will find is an article by Grady, Les Grady and Mel Hockenbury that references previous work by Tomlinson and others that describe MBT as being an inhibitor to biological nitrification.

Q And where did you get those articles, that series of articles?

A These articles came from a literature search. One being from the Journal of the Water Pollution

Control Federation, that being the Hockenbury and Grady article. Another article came -- I apologize for not mentioning this in my initial statement -- another article describing MBT as a nitrification inhibitor came from the National Corn Handbook. And the last article is one that Grady built his work on, Grady and Hockenbury, and it came from the Journal -- this article came from the Journal of Applied Bacteriology.

Q And are those articles published in recognized journals in your profession?

A Yes, sir, they are.

Q Did you rely on those articles in preparing your testimony?

A I did.

MR. KISSEL: I move the admission of Petitioner's Exhibit Number 9.

MS. WILLIAMS: No objection.

HEARING OFFICER HALLORAN: Petitioner's Exhibit Number 9 is admitted into evidence.

Q I show what has been marked as Petitioner's Exhibit Number 10 in the Adjusted Standard 02-5 and ask you to briefly describe what that is, please.

A This exhibit actually is contained in the one we just processed. And, again, it's an article written

in the National Corn Handbook describing how MBT can be used as a biological nitrification inhibitor in fertilizers.

Q Is that the National Corn -- what is it, the National --

A The National Corn Handbook.

Q Is that a journal that is relied upon in your business and trade?

A It is.

Q And did you rely upon that article in preparing your testimony today?

A I did.

MR. KISSEL: I move the admission of Petitioner's Exhibit Number 10.

MS. WILLIAMS: We don't have a copy of it.

MR. KISSEL: Do you want to take a look at it? We will wait until she looks at it. I will go on if that's okay.

Q The next three exhibits, Mr. Flippin, I will ask you as I would have if you had testified with your written statement to explain a little more. But in any case, first let's identify them. And I show you what has been marked as Petitioner's Exhibit 11 and ask you to tell me what that is, please.

A This is a summary report that I prepared on May 17th, 2002. And what this report did is it summarized our findings about alternative treatment technologies that would be applicable for reducing effluent ammonia-nitrogen from the Noveon-Henry plant. In this exhibit you will find not only the description --

Q Before going into that, just describe it so we can get it into evidence.

A Right. It's basically a summary of alternative technologies, their operating costs, their capital costs and their present worth costs for reducing effluent ammonia-nitrogen.

Q Did you prepare that document?

A I did.

Q What did you rely on to prepare that?

A I relied on waste load information entering the primary treatment system at the Noveon-Henry plant. I relied on final effluent quality being discharged from the Noveon-Henry plant. I relied upon my own process design development capabilities. And I relied upon the assistance of other engineers as well as construction costs estimators within our company and knowledge of the -- my working knowledge of the site, the

Noveon-Henry plant.

Q Did you -- does that document contain true and correct information?

A It does.

MR. KISSEL: I move the admission of Exhibit Number 11.

MS. WILLIAMS: Can I ask a couple questions? First of all, do you want to clarify for the Board that this is the same exhibit that's number 7 for the Petitioner, is that correct, Exhibit 7 to the Petition for Adjusted Standard; is that correct?

MS. DEELY: Yes. That's what it is.

MS. WILLIAMS: Would it be possible for the witness to clarify what data he meant that he used as a basis for these numbers as far as where we could find that information elsewhere in the record?

THE WITNESS: The data that I used in developing this waste load and used in developing the designs and the cost estimates within this document, let's take, first of all, the waste load being discharged to the primary treatment system. That data stated in the exhibit was individual waste stream data gathered in 1995 which, in discussing this data with the Noveon-Henry plant staff, is not significantly different

from what would be present today.

The effluent data that I used and have summarized is data that was gathered during 1999 through 2000. And, again, it would not be anticipated after talking with the plant staff, particularly Guy Davids and Dave Giffin, it would not be expected to be appreciably different today.

MS. WILLIAMS: I have no objection to this exhibit with those clarifications.

HEARING OFFICER HALLORAN: So what about the Petitioner's Exhibit Number 10?

MS. WILLIAMS: That's fine, too.

HEARING OFFICER HALLORAN: Okay. Petitioner's Exhibit Numbers 10 and 11 are admitted into evidence.

Q Mr. Flippin, please look at Petitioner's Exhibit 11 which is in evidence. And would you briefly describe what is contained therein and some of the conclusions you came to?

A Yes. Be glad to. First of all, let me say that what you are seeing if you had this document in front of you is a listing of what I'll call all proven technologies for effluent ammonia reduction. And in this list you will see alkaline air stripping. You will see that applied to the PC tank, the PVC tank and the

secondary clarifier effluent. In alkaline air stripping you basically convert the ammonia in the wastewater to a gas, and then you strip it off. Next you will see a technology known as struvite precipitation; ammonia can be precipitated. It can be precipitated as struvite which is essentially ammonium magnesium phosphate. Next you will see breakpoint chlorination of a secondary clarifier effluent. In that process ammonia is oxidized to nitrogen gas. Next you will see nitrification of the nonNoveon wastewaters also called the PVC tank wastewaters. You will see biological nitrification or combined nitrification in a single stage of both the Noveon wastewaters and the nonNoveon wastewaters called the PVC tank wastewaters. When I speak of nonNoveon wastewaters, please let me remind you that at the site there are two companies that share a wastewater treatment facility. One being the Noveon plant, the other one being the PolyOne plant formerly known as Geon, formerly known as BF Goodrich.

Then you will see a treatment called ion exchange treatment which basically is a resins columns system where either sodium or hydrogen, and in our case we picked a hydrogen resin, where the resin releases hydrogen in order to, if you will, take hold of the

ammonia ion in solution.

Lastly, you will see ozonation of the final effluent. And in a similar way as chlorine, ozone has the opportunity to oxidize ammonia to nitrogen gas which then leaves as a gas. In nitrification a second -- the last option listed, which is number 10, is nitrification of secondary clarifier effluent, also called tertiary nitrification. We considered that. We believe these are the proven technologies for effluent ammonia reduction.

Q At the Henry facility?

A At the Noveon-Henry facility.

Q These are on page 2 of Petitioner's Exhibit 11, you list the technologies and they are listed under bullet points; is that correct?

A That is true.

Q To the right of each technology is a number?

A Yes, sir.

Q To what does that number correspond in the later document?

A In the later document what those numbers correspond to are headings of tables where we present what we believe to be the capital cost required to install those technologies at the Noveon-Henry plant,

and those numbers also are presented in tables where we present what we believe to be the annual operating and maintenance costs that would be incurred if those technologies were installed at the Noveon-Henry plant.

Q Let's take one of the options. Which option would you prefer to discuss to give an example of what this does?

A The easiest one -- let's just take number 1.

Q Okay.

A Using number 1, which is alkaline air stripping of the PC tank contents with off-gas collection and treatment. Let me first of all say that when you strip ammonia or you strip volatile amines which later can, in biological treatment, be converted to ammonia, when you strip those, you cannot help but also strip other volatiles. And the Noveon-Henry plant analysis of air quality would indicate that if this option were employed you would have to cover the PVC tank and collect the off-gas and treat that off-gas to maintain air permit compliance. So if you look in table 3, what you will see --

Q What is the title of that?

A The table 3 is entitled Capital Cost Estimates for Treatment Alternatives. And what you will

see there is, we believe, that the pretreatment -- we broke these costs in terms -- we split these costs out in terms of pretreatment, primary treatment and secondary treatment and tertiary treatment depending on where the treatment option was employed. If it was employed prior to primary clarification in treatment, it was called pretreatment. If it was employed during the primary treatment process, it was called primary treatment. If it was employed as part of the activated sludge treatment system that they already have in place, it was termed secondary treatment. If it was employed downstream of the secondary clarifier, it was called tertiary treatment.

In this case the treatment would be employed ahead of the primary treatment system; therefore, it was termed pretreatment. We believe the capital costs of installing that treatment system equipment-wise was $650,000 or .65 million. All of the terms in this table are presented in millions of dollars. So the subtotal for the equipment and materials were $.65 million. We then added to that what we believe was going to be involved in site work and interface piping costs. And those costs, if you will, were not rule-of-thumb numbers. Those were calculated numbers based on knowing

the proximity of the PC tank to where you could place an off-gas treatment device and the proximity of the PC tank to the primary treatment system. So that was not a rule-of-thumb number. It was actually a calculated number for site work and interface piping of $100,000. The electrical and instrumentation costs, again, was a calculated number, not a rule-of-thumb number. It was based on the proximity of this treatment device to available electrical power on the Noveon-Henry plant site. That was an additional $250,000 or .25 million.

Now you are going to see a list of terms called "contractor indirects." Anytime a contractor installs a piece of equipment he will have indirect costs that he passes through to the purchaser or to the buyer of this system. You will also see the costs for engineering of this system and the construction management of this system during its installation and construction. And you will see a term called "performance bonds." And most projects of this nature require a performance bond. The percentages listed for contractor indirects, engineering and construction management and performance bonds are conventional numbers used for projects of this type.

Lastly, when you sum those up, you get $1.17

million. And what that represents is the constructed costs if all run smoothly. And you always have a contingency in an installed-cost estimate. This type of project, we believe the 15 percent contingency was a reasonable number. That 15 percent represents .18 or $180,000, .18 million or $180,000. When you sum it all up, including the contingency, you get what we would call a total-installed cost and that is $1.35 million for what we are calling alternative number 1, which is alkaline air stripping of PC tank contents with off-gas collection and treatment.

Q Did you do the same thing for alternatives 2 through 10 as well?

A Yes, we did.

Q So the total-installed costs for those particular alternatives are listed under their number?

A They are.

Q And done on the same basis that you talked about number 1?

A Exactly.

Q Now in addition to the information on table 3 there, you turn a couple of pages into your exhibit, there is a document entitled Figure 1 Block Flow Diagram of Waste Stream Sources and WWTF. Can you tell us what

that is?

A Yes. What that is is an illustration of the current wastewater treatment facility provided at the Noveon-Henry plant.

Q Is that referred to in your testimony as Figure 1?

A It is.

Q Now I'm looking at the next page. There is a Figure 2. Can you tell us what that is?

A Yes, I can. What that is is a block flow diagram of alkaline air stripping of the alkaline air stripping treatment alternatives that range from applying that technology to the PC tank contents as we just discussed, applying that to the PVC tank contents and applying that to the secondary clarifier effluent.

Q So am I correct in saying that if you looked at Figure 2, you see the block flow diagram for the various treatment alternatives numbered 1, 2 and 3; is that correct?

A Yes, sir, that's true.

Q And that is, there are flow diagrams or block flow diagrams in this exhibit for each of the alternatives 1 through 10?

A There are. And one thing that should be

noted about these block flow diagrams, the existing equipment in these block flow diagrams is listed in bold and the new equipment is listed in a nonbolded line. So that would help people know what would have to be installed to implement the alternative.

Q Turn to the next page, page 3 of Petitioner's Exhibit 11 and look at table 4. Will you tell the Board what that is and use alternative number 1 again, please.

A Be glad to. That is the annual operating and maintenance cost estimates for the treatment alternatives listed 1 through 10. And under number 1, if you will, what you will see is the annual O and M costs listed in terms of thousand dollar increments. So, for example, the labor cost associated with operating alternative number 1 we estimated to be $32,000 a year. That was based on a labor cost of $40 an hour which includes benefits. We estimated it would cost $64,000 a year using an electrical cost of 6 cents per kilowatt hours.

HEARING OFFICER HALLORAN: You may continue, Mr. Flippin.

A We estimated natural gas cost of this alternative to be $18,000 a year, and that is based on 6 cents per therm. Then we estimated a maintenance

materials cost --

Q Before -- there are other costs that are listed that are not applicable to alternative 1. Just describe those briefly.

A Exactly. Thanks. The chemical costs that we use here is actually the chemical costs -- we calculated quantity of chemicals that would be needed and then used actual costs that Noveon pays for those chemicals at the time this document was written. Then there is a resin replacement cost, and at the time this document was written, the resin replacement cost if ion exchange had been chosen would have been $35 per cubic foot.

On off-site disposal costs, that value used there again referred to the ion exchange process primarily. And that was based on a conventional value and a typical and common value of 10 cents per gallon for off-site disposal. For maintenance materials cost, which was part of alternative number 1, we used a conventional value of 5 percent of the equipment costs to calculate the annual O and M maintenance cost. And for alternative 1 that would have been $17,000 a year. The next is the subtotal of what I will call the cost we are able to define at this point. And that subtotal cost was $130,000 a year. And what you know when you do

these annual O and M cost estimates is you are bound to have missed something. And so we added a contingency here of 10 percent which is quite reasonable. And 10 percent, needless to say, on $130,000 a year is $13,000 a year contingency.

When you sum all that up, you get a total annual operating cost of $143,000 a year. And we made -- we calculated that same total annual cost for all 10 alternatives.

Q So, for example, if for alternative number 8, which is ion exchange treatment of effluent -- of final effluent, the annual operating cost is $576,000?

A Yes, sir.

Q Now can you describe table 5 for us and why you have that table in there.

A I can. If you want to know what anything costs you, it's not just what you pay to have it installed, it's also what you pay to keep it going. And so you have got to know when you build something how much money do you need in the bank today, to not only build it, but to keep it running. And that is called present worth cost. And so anytime you make a comparison of any treatment process and, candidly, anything that has an installed cost and continuing

operating cost, it must be done on a present-worth-cost basis, that comparison, so you genuinely will know how they compare. That comparison, again, defines what you must have in your pocket today to fund that process. And in this table -- and it's called comparison of present worth cost and ammonia removal for treatment alternatives. And those costs were calculated for 1 through 10. The first column, a row in this table, is the pounds per day of ammonia reduced through the use of this process. The next column --

Q Would you describe that for alternative number 1, please, what we have been following through this?

A Be glad to. For alternative number 1 we calculated an estimated 247 pounds per day of effluent ammonia reduction if this process were installed and operating. The next row is the ammonia removal expressed in a percentage. If this process were installed while removing 247 pounds per day on average, it would reduce the average effluent ammonia discharge by 27 percent. The present worth cost of installing this alternative is expressed in term of capital costs which, if you remember earlier, we said would cost $1.35 million to install, and it's present-worth-operating and

maintenance cost based on a 10-year project life, based on an annual interest rate of 8 percent, and based that at the conclusion of that 10 years of having no salvage value, it's operating and maintenance cost would require $960,000 in the bank today to fund it over the next 10 years.

Q Mr. Flippin, there is no present worth cost assigned to the capital cost because it is assumed that it is paid on construction; is that correct?

A That is true.

Q If it was financed there would be an additional cost as a result of that for the financing?

A That is true.

Q Or the lack of use of that capital for other things, correct?

A Yes, sir.

Q And you use a 10-year period. Is that customary?

A The reason the 10-year period was used, if you look at the life of concrete tanks and other things like that, most would use a longer period of time. However, if you look at the cost of equipment like air strippers of pots of, if you will, that type of equipment, a 10-year life is not an unusual life. And

so a 10-year life, if you will, was considered to be a minimum term in project life. Candidly, had we used a longer life, it would have made our present worth costs for operation and maintenance higher. So when I present the total present worth cost for these alternatives, please understand that these are minimum total present worth costs because of the life that I chose of 10 years.

Q Have others used longer lives in assessing present worth costs for waste treatment facilities?

A Yes, sir, they have.

Q How high or low have they gone?

A The highest that I have seen, most -- let me say the conventional practice is to use a life no longer than 30 years, some use 20.

Q And, generally speaking, what happens when you use a longer life?

A It makes the present worth cost of the annual O and M, operation and maintenance cost, much higher.

Q That was not -- you used 10 years which makes it lower than 30 years, is what I'm saying?

A And makes it lower than 20 years as well.

Q I show you what has been marked as Petitioner's Exhibit 12. Would you tell us what that

is, please?

A Yes, I will. This exhibit is our attempt to quantify what the present worth cost would be if we were to provide incremental reduction of effluent ammonia-nitrogen.

Q Did you prepare this exhibit?

A I did.

Q Are the data expressed therein true and correct to the best of your knowledge?

A They are.

MR. KISSEL: I move the admission of Petitioner's Exhibit 12.

MS. WILLIAMS: Is this attached to this testimony?

MR. KISSEL: Yeah. Yes, it is. It should be.

MS. WILLIAMS: What exhibit was it to the testimony?

MS. DEELY: It was Exhibit D.

MS. WILLIAMS: I don't see anything to object to.

HEARING OFFICER HALLORAN: Petitioner's Exhibit Number 12 is admitted. And, also, while we are on that subject of exhibits, I'm missing Petitioner's Exhibit Number 10. I think Ms. Williams was taking a look at that.

MR. KISSEL: I think you admitted that into

evidence.

MS. WILLIAMS: I gave that back.

HEARING OFFICER HALLORAN: I don't have it physically.

MS. WILLIAMS: You gave it to me to look at, and then I gave it back.

(Brief pause in proceedings.)

HEARING OFFICER HALLORAN: Thank you.

MR. KISSEL: Are 11 and 12 in evidence?

HEARING OFFICER HALLORAN: 11 and 12 are in evidence, correct.

MR. KISSEL: Okay. Thank you.

Q How many pages does Exhibit 12 consist of, Mr. Flippin?

A Two pages.

Q Would you take a representative technology and run through the particular table?

A I will be glad to. Let's talk about one that has where we looked at incremental removal to make matters easier. Is that reasonable?

Q Yes.

A Effluent stripping, this is basically taking the secondary clarifier effluent, elevating the pH to approximately 10-1/2 or up to 11, and placement through

the air strippers. The intent of that is to strip the effluent ammonia from the liquid phase into the air. And if you will notice in this option we are not providing off-gas treatment. So in this table it's called effluent stripping with no off-gas treatment.

Q Looking at the first page of Petitioner's Exhibit 12, with the line that starts "WWTF component," it starts with the third line, "effluent stripping"?

A It starts with the --

Q The fourth line.

A Right. The third line, we did also look at what the cost would be if we were to provide off-gas treatment. But you are right, it starts with a fourth line which is "effluent stripping without off-gas treatment."

Q Will you describe that line?

A Be glad to. That line, if you will, assumes that we can strip 98 percent of the effluent ammonia being discharged into the air. The next column is based on the cost of stripping 75 percent of the ammonia into the air. The next column is based on stripping 50 percent of the effluent ammonia into the air, and the next column is based on stripping 25 percent of the effluent ammonia into the air.

Q Would you take -- let's take the 75 percent removal, for example. Would you just go down briefly through the line below that to explain how you came to the various numbers therein?

A Glad to. The labor hours we believe to operate this system would be 1,300 labor hours a year. At the $40 per hour labor costs that are previously explained, that would be $52,000 a year in labor. The power requirement for this alternative is 450 horsepower. The kilowatt hours, just basically converting the 450 horsepower are 2,940,732 kilowatt hours for an annual electrical cost at 6 cents per kilowatt hour of $176,444. The maintenance materials costs, again, based on 5 percent of the equipment -- capital equipment costs, is 101,000 -- sorry, $1,013,600 and expressed as an annual cost, that would be $50,680 per year over the 10-year project life.

For chemical costs, let me say that these chemical costs on the front end, Noveon has done an excellent job in negotiating good chemical costs. These chemical costs would be higher for many people. For caustic condition Noveon would be at $240 per ton for 50 percent caustic. In this alternative Noveon would be spending $434,000 a year in caustic. And when you raise

the pH up to approximately 11 to strip the ammonia, you have to lower the pH to at least 8-1/2 before you discharge it to maintain effluent permit compliance. So we also have acid condition here to lower the pH, and Noveon's cost at this time was $46 per ton for 98 percent sulphuric acid. We believe the annual cost incurred for the acid addition is $119,850.

When you sum -- and we also -- in some of these alternatives we needed to add phosphorus. In some of these alternatives we use, we looked at adding magnesium hydroxide. In some of these alternatives we looked at adding hydrochloric acid. In some of these alternatives we looked at adding chlorine gas. And I have listed the chemical cost that we assume for each of those. And I say "assume," those are what we believe the Henry plant would need to pay for each of those.

The annual chemical cost was $553,850 a year. The next column that you see is Annual Resin Replacement Cost, Annual Off-Site Disposal Cost, Natural Gas Cost in which this stripping alternative did not have any of those. We then calculated the subtotal of the annual cost, and for this alternative it would be for labor, electrical, maintenance materials and chemical costs. The annual operating cost would be $832,974. We added a

contingency, as I described earlier, on the annual O and M cost of 10 percent because you almost always leave something out. And that contingency was $83,297. The total annual operating and maintenance cost we estimated for this alternative to be $916,271. And when that was converted to a present worth value, what you would need to have in the bank today to fund that annual operating and maintenance cost over the next 10 years at an 8 percent interest rate, you would need to have in the bank today $6,148,181. The capital cost for this alternative was $3,770,418. And so the total present worth cost, that is, adding the present worth annual operating and maintenance cost, plus adding the capital costs, the total present worth cost was $9,918,599. The average ammonia removal that we believe this process would provide was 648 pounds per day, again, resulting in approximately a 75 percent removal. The present worth cost expressed in dollars needed in the bank today per pound of ammonia that would be removed over this 10-year project life is the cost we calculated which was $4.20 per pound. Let me explain one more time how that's calculated. You take the total present worth cost, what you must have in the bank today to install this process and to operate this process over the next

10 years, and then you calculate, during that 10-year period, how much ammonia you would remove. And that's simply the pounds per day of ammonia removed, times 365 days per year, times 10 years. And so you have the total pounds of ammonia removed, the total present worth cost during that 10-year period. You divide the two and you get $4.20 present worth dollars per pound of ammonia removed.

Q You take the annual amount of ammonia removed and divide it? You didn't do it that way, did you? You used the entire 10 years?

A I did.

Q How many technologies in Exhibit 12 did you evaluate for this incremental approach?

A We evaluated a total of 10 technologies. And for the incremental approach we evaluated three.

Q That is effluent stripping with no off-gas, effluent ion exchange and tertiary nitrification?

A Yes, sir.

Q And those latter two appear on page two of the exhibit?

A Yes, sir.

Q Thank you.

Mr. Flippin, I show you what has been marked

as Petitioner's Exhibit Number 13 for identification.

A Yes, sir. This is a document that I prepared, and the title of this document is the Comparison of Costs and Removal of Effluent Ammonia Removal Processes for the Noveon-Henry plant, the Noveon-Henry wastewater treatment facility with a 10-year project life. And then I also repeated the same calculations with a 20-year project life.

HEARING OFFICER HALLORAN: Mr. Kissel, do you have Exhibit 12 that's been admitted?

MR. KISSEL: I believe so. This is the --

HEARING OFFICER HALLORAN: Thank you.

A And then --

Q Let me, just so we make the record clear, the 10-year project life appears on the first two pages of the exhibit; is that correct?

A That is correct.

Q And the 20-year project life appears on the next two pages?

A That is correct.

Q And the next four pages is what?

A The next four pages is a comparison of removals and reliability of effluent ammonia removal processes for the Noveon-Henry wastewater treatment

facility. And in this document we list each technology, what we believe to be the average effluent ammonia reduction that can be achieved with that process. We then give it a -- each process a reliability rating. And the reliability rating, basically 10 would be the highest and zero would be the lowest. And reliability was based on our relative assessment of mechanical and processed performance reliability to achieve the average percent ammonia reduction removal stated. In essence, reliability means the ability of a treatment process to achieve the predicted effluent ammonia-nitrogen concentrations on a routine basis. Then the next column is a Comments column where we describe what each of these technologies would involve and what obstacles, if any, would they face.

Q Going back to the first four pages, and I think we pretty much talked about the capital cost, operating costs and present worth costs, have we not, in the percent removal?

A Yes, sir.

Q There is a column for each of these which says dollars per pound ammonia or NH3-N removal. Would you tell us both on the first page and on the third page of the two cost comparisons what that is?

A Be glad to. For the first page that was based on a 10-year project life at 8 percent interest. And, again, we calculated over that 10-year life what the present worth dollars one would need in the bank today to not only build the process, but to fund the process over a 10-year period. We then calculated the cumulative pounds of ammonia that would be removed during that 10-year project life and, basically, simply divided the present worth dollars by the cumulative pounds of ammonia removed during the 10-year life. And that category is presented in column 4 in dollars per pound of ammonia removed. And when you see NH3-N, that's an acronym for ammonia expressed as nitrogen.

Q Did you prepare that document?

A I did.

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

A It is.

MR. KISSEL: I don't know if I moved the admission of that.

MS. WILLIAMS: I would like to ask one question before --

MR. KISSEL: I just want to move the admission of Petitioner's Exhibit 13.

MS. WILLIAMS: Would you mind asking the witness to clarify for us -- for those of us that are not engineers, this gives me like major headaches -- that the technologies listed in this Exhibit 13 are the same, right, as what's listed in Exhibit 11?

MR. KISSEL: Is that correct?

THE WITNESS: That is correct.

MS. WILLIAMS: There are some slight named differences that if you understand what the technology is probably you could probably tell right away that PC tank stripping with off-gas control is the same as alkaline air stripping of the PC tank, but I just want to make sure that's the case, right?

THE WITNESS: That's the case.

MS. WILLIAMS: Thank you. I have no objection.

HEARING OFFICER HALLORAN: Petitioner's Exhibit Number 13 is admitted into evidence.

A Would you like for me to discuss -- you had asked me to discuss pages 1 and 3. And I just discussed the column 4 on each of those pages. Is there any further explanation you would like for me to offer?

Q No. Not at this time. I show you what we have marked as Petitioner's Exhibit 14 for identification. Tell me what that is, please.

A I will. A discussion occurred in which the question was asked, What were the population equivalents for the untreated waste load at the Noveon-Henry plant prior to 1990. And this written testimony prepared by me addresses that question.

Q Can you briefly summarize -- or strike that.

Did you prepare this document?

A I did.

Q The information relied on in that document included what?

A The information relied upon in that document came from two sources. It came from Illinois regulations, particularly section -- and I have listed in this document 304.345. It needs to be corrected to be 301.345. But it relies upon the regulations' definition of population equivalents. It relies upon memos sent within the Illinois EPA. It relies upon the Illinois EPA's description of the Noveon wastewater untreated waste load in 1983. It relies upon the definition of the Noveon untreated waste load as defined in permit applications for construction approval, dated April 23, 1987 and approved on May 28th, 1987, by IEPA. An application for permit construction submitted on April 21st, 1988, by Noveon and approved by IEPA on

October 11th, 1988. Information presented of the untreated waste load by Noveon and its application for construction approval on April 24th, 1989, and approved by IEPA on June 28th, 1989. An application for construction approval submitted by Noveon on September 11th, 1989, where the untreated waste load was described and approved by IEPA on October 20th, 1989. And I went through this exercise to see if at any point in this prior time previous to 1990, at any point was there any information that would define the Noveon population equivalents at greater than 50,000, and at no point did that occur. At no point did the data suggest those populations equivalents were greater than 50,000. In all cases they were less.

MR. KISSEL: I move the admission of Petitioner's Exhibit Number 14.

MS. WILLIAMS: At this point I have some objection, I guess, that I would like to raise. This probably can be cured maybe by an additional exhibit. In the Agency's opinion I think it's worth stating we don't really think this information is relevant or necessary to the Board to make its decision in this case, but we recognize that there is very broad latitude here. If the hearing officer feels it's relevant, then that

pretty much goes. But I would like to request at this point that if this exhibit is going to be entered that the document referred to at the bottom of the first page, August 24th, 1983, memo also be entered into the record as an exhibit to support the foundation of it.

MR. KISSEL: I don't think it's necessary to support the foundation, but I have no -- it's an Agency memo so I have no problem --

MS. WILLIAMS: I don't have a clue in my box where to find a copy of it. And I took your word for it yesterday that it was somewhere as part of the permit appeal record. And I would appreciate it, and I think it would make it easier for the Board and us to be able to refer to that document today. I don't think it's unreasonable. They already have it ready. Thank you.

MR. KISSEL: Can we mark this exhibit as Petitioner's Exhibit 15 and ask Mr. Flippin to take a look at that, please?

HEARING OFFICER HALLORAN: I'm sorry. What is it again, 15?

Q Would you describe what it is, please?

A Sure. Exhibit 15 is a memorandum prepared by the Illinois EPA in which the Illinois EPA states on pages 1 and 2 what they believe to be the untreated

waste load associated with the Noveon-Henry plant.

Q It is an Illinois Environmental Protection Agency memo that was provided to you?

A Yes.

Q Is this the memo that is referred to in your testimony, Thomas W. Meyer and Lyle A. Ray, in their memo dated August 24th, 1983?

A It is.

MR. KISSEL: I move the admission of Exhibits 13 and 14 -- I'm sorry, 14 and 15.

MS. WILLIAMS: 14 and 15. I just want to point out for the hearing officer that going down this road of looking at actually what the PE is, we are more than prepared to cross-examine Mr. Flippin, present counter testimony and even, possibly, bring in further rebuttal testimony tomorrow, if necessary, to fully develop that issue. But we do feel it's really not relevant to what we are talking about here today as to whether or not relief from the standard as it exists is appropriate.

HEARING OFFICER HALLORAN: I'm going to split the difference with you, Ms. Williams, so to speak. I'm going to allow exhibit -- Petitioner's Exhibit 14 is admitted over your objection. But your request for Petitioner's Exhibit Number 15 is also admitted. And

that's the memo you have just spoken to. 14 and 15 are admitted into evidence. Objection so noted.

MR. KISSEL: I have no further questions at this time.

HEARING OFFICER HALLORAN: Ms. Williams?

MS. WILLIAMS: Do you want me to get started?

HEARING OFFICER HALLORAN: Sure.

CROSS-EXAMINATION

BY MS. WILLIAMS:

Q Good morning, Mr. Flippin. I'm going to start by asking you some questions in general about the prefile testimony, and then we will probably go more specifically through some of your exhibits.

On the first couple of pages -- I believe it's page 3 of your testimony, yes, page 3 -- you list in several different categories a number of facilities that you have worked on installing nitrification systems that are in some way comparable to the work you have done in this case, correct?

A In this case I have evaluated nitrification facilities. And in these other cases I've actually developed designs which were installed.

Q So in all these cases designs have actually been installed and implemented?

A In the cases listed on page 3, these are facilities that have been installed and they are operational.

Q With the exception --

A With the exception of Eli Lilly in Puerto Rico which is currently under construction.

Q What about the Lower Bucks County?

A Rohm and Haas combined with Lower Bucks County, Bristol, Pennsylvania, facility; that facility was designed but never installed due to lack of funding.

Q How much was that project projected to cost?

A We were responsible for developing the design for a construction -- sorry, for a detailed design engineering firm, and they were the ones who prepared the capital costs for that facility. So I'm unaware of what their cost was for that facility.

Q What about the others?

A The other facilities -- if you will, these facilities, my role in them, let me say, was primarily to develop the process design.

Q So in none of these were you responsible for coming up with the cost estimates then?

A On none of these -- let me look at this one moment.

(Pause in proceedings.)

A On none of these was I responsible for coming up with the cost.

Q Did any of these plants, once the facilities were implemented, have a discharge exceeding 225 milligrams per liter of ammonia-nitrogen?

A In each of these cases these facilities were designed to provide complete nitrification. And so the effluent ammonia concentrations were very low.

Q Like lower than 5?

A They were certainly lower than 20. However, I should note that for several of these facilities the incoming ammonia concentration was as high as 400 to 600 or higher.

Q Pounds per day?

A Milligrams per liter. On a pounds-per-day basis it would have been on some of these greater and on some of these less.

Q Looking on page 19 -- well, I might be looking at page 19 of your old testimony. I'm having a little trouble going from --

(Pause in proceedings.)

Q In your testimony you discussed upgrading of the tankage at the Noveon plant, correct, to be fully

compliant with the ten state standards?

MR. LATHAM: Where is his testimony?

MS. WILLIAMS: It's in here somewhere.

Q Is it true -- I mean, if you don't recall testifying to that then I can ask another question.

(Pause in proceedings.)

Q There we go, page 21, second paragraph. Are you following me now?

A I am.

Q And you state that Noveon expanded aeration in 1998 by 100 percent; is that correct?

A That is true.

Q Isn't this because of an expansion in production?

A It was done for several reasons. One was to accommodate expanded production. Two was to provide greater treatment plant flexibility.

Q Can you explain in more detail what you mean by "greater flexibility"?

A Certainly. There are ways -- if all you needed was greater oxygen aeration upgrades, there are ways to accomplish that within a given tankage. However, when you go to the extent of building additional tankage, not only do you get the additional

oxygen transfer, you get the additional flexibility of having added tankage. That allows you, if needed, to take aeration tanks out for service and other flexibilities.

Q And they doubled the tankage, correct?

A They did.

Q Did this doubling provide greater oxygen transfer?

A The additional aeration equipment that came with this doubling certainly did.

Q Did it provide any improvement in ammonia effluent levels?

A It did not to my knowledge.

Q Can you explain why?

A I believe the reason that it didn't was because of the presence of bio-inhibitors in the influent to the Noveon-Henry plant wastewater treatment facility.

Q Did it have anything to do with alkalinity?

A The Noveon-Henry plant has adequate alkalinity to initiate and accomplish some nitrification.

Q What do you mean by "some nitrification"?

A In nitrification you require -- when the

bacteria removes essentially a pound of ammonia, they consume approximately seven pounds of alkalinity. They will continue to do that until they reach a limiting concentration of alkalinity at which time they were unable to provide additional ammonia removal. The Noveon-Henry plant does, in fact, have alkalinity present at concentrations great enough to achieve some nitrification if it were not for the presence of bio-inhibiting compounds that inhibit nitrification.

Q So can you explain to us the statement on page 16, "Consequently, if biological nitrification could be implemented with inhibitor control, the majority of alkalinity would have to be chemically added"?

A Clearly my two statements are very consistent.

Q I'm not saying they are inconsistent. I'm just asking you to explain them for us.

A Glad to. The Noveon-Henry plant --

Q We are having a much more friendly proceeding today than yesterday, Mr. Flippin.

A The Noveon-Henry plant wastewater, when we have analyzed it in the past, contained about 200 to 200-- between 200 and 300 milligrams per liter of

alkalinity. We have found in our work that a limiting concentration of alkalinity nitrifiers, basically, quote, unquote, become inhibited because of a lack thereof, is around 50 parts per million. So what you see is Noveon wastewater frequently and commonly contains about anywhere from 200 to 250 extra milligrams per liter of alkalinity that could be used for nitrification. If you divide the 200 to 250 by 7, what you will see is that normally they can remove -- they can nitrify approximately 30 milligrams per liter --

Q 5.7, 35.7.

A -- of ammonia. But, if you will, the ammonia that needs to be nitrified if they were to provide complete nitrification is certainly greater than 30 on average. And so that is why I am saying that if they were required to nitrify completely the bulk of the alkalinity that they would need would have to be added. There is just not enough present to do complete nitrification.

Q Can you explain why Mr. Giffin told us yesterday that they didn't add alkalinity when they worked on attempting to reduce inhibitors?

A What the facility did do is they ran a pretreatment system designed to remove

mercaptobenziothiazole to a degree -- also known as MBT in my testimony -- and that pretreatment system was successful in removing up to 50 percent MBT and even greater. If you will, they then after running that pretreatment system for awhile with full scale implementation, in other words, all of the polymer chemicals wastewater went through it. After they had run that pretreatment system for approximately two months, they brought in nitrifiers from a facility whose population was primarily that, nitrifiers, and added it. When they added it, they had surplus alkalinity, surplus dissolved oxygen. And if there had not been an inhibiting environment, nitrification would have initiated and would have been maintained to a certain degree. And so the reason -- the fact that they did not, quote, unquote, add any additional alkalinity did not, if you will, jeopardize the ability to see if this trial would initiate and maintain a certain level of nitrification.

Q You also talk in your testimony about something you call alpha. Can you explain what you mean by alpha?

A Yes. Alpha is the oxygen transfer in wastewater divided by the oxygen transfer in tap water

or clean water, if you will. And so the higher the alpha, the easier it is to transfer oxygen in a wastewater.

Q And you testify that Noveon's alpha is something like half that of a typical municipal?

A Yes. Right. Typically, in a municipal wastewater an alpha value for fine bubble-diffused aeration is approximately 0.6. In 1987 when Gerry Shell, a nationally recognized expert in oxygen transfer, did test work on the Noveon-Henry plant wastewater, they found with fine bubble-diffused aeration an alpha of .35.

Q Did you do any tests since then to figure out what's causing it?

A I have not.

Q Of course, it can be assumed that if that number was higher, the efficiency of treatment at the plant would be better, correct?

A The oxygen transfer does not define the treatment efficiency. What happens, the lower your alpha, the more horsepower or the more aeration equipment you have to install to provide the same level of treatment.

Q Does that translate to a rate of 4.6 pounds

of oxygen per pound of nitrogen? Would you agree with that?

A I'm sorry, would you repeat the question?

Q Did they supply a rate of 4.6 pounds of oxygen per pound of ammonia-nitrogen they were trying to remove in the tanks?

MR. KISSEL: I just -- I don't get the context. Is there some document that we are referring to? I just want to make sure the witness understands what the question is. That's all.

THE WITNESS: And, candidly, I don't.

MR. KISSEL: I sort of figured that.

Q We are trying to get at just simply whether there was an attempt made to provide as much oxygen as would have been necessary to nitrify. I mean, we know there is an issue with bio-inhibition, as well, but it seems relevant to find out whether there was enough oxygen provided as well?

A Yes, it is relevant. And the answer to that question is when the plant ran its interim pretreatment system on a full-scale plan, treating all of the PC wastewater for two months before adding the nitrifiers at the time prior to the addition of the nitrifiers, after the addition of the nitrifiers and for subsequent

weeks following that addition, the plant maintained ample dissolved oxygen for the nitrifiers to have been able to nitrify.

Q Can you quantify the ample oxygen for us at all?

A I can. The plant has a policy of typically operating at dissolved oxygen levels of 3 milligrams per liter or greater. And those concentrations by no means would inhibit nitrification.

Q Now sometimes they go lower than that, correct, because your testimony says a minimum of 1.5 milligrams per liter?

A At times they will go lower than 3, down as low as 1-1/2. But again, let me say that plenty of nitrification systems maintain nitrification at 1-1/2 milligrams per liter DO.

Q On page 29, last paragraph -- I know I'm jumping around a little bit. I apologize ahead of time.

A That's okay.

Q You talk about comparing the present worth costs per pound removal with municipal plants. In the last paragraph there you say, "It is less likely that the present worth cost comparison of these facilities reveal that the cost of ammonia-nitrogen removal is less

than 20 cents a pound." Can you tell me where you get this, and is there something we can look to to find figures like these?

A Yes. There is something that you can look to. We evaluated the surcharge cost for the City of Nashville, Tennessee. And in making such an evaluation --

Q Surcharge to industrial sources, or --

A Surcharge to anyone who discharged concentrations that the city considered greater than the concentration associated with typical domestic sewage.

MR. KISSEL: I think he is referring to industrial user charges --

MS. WILLIAMS: Right.

MR. KISSEL: -- which a lot of sanitary districts have.

Q This isn't looking at how much it costs to treat the domestic waste then, or is it?

A This is looking at how much does it cost to treat the concentrations -- this is looking at the cost of what it takes to treat wastewaters that are stronger in concentration than domestic sewage.

Q By a domestic plant that's not built to do that?

A No. By a domestic plant that is built to do that.

Q And that is which plant here are we talking about?

A The Knoxville Utility Board operates multiple plants that receive industrial wastewaters and also apply surcharges based on BOD, suspended solids and ammonia.

Q Did you look at any other? Was that the only one you looked at?

A I looked at the City of Chattanooga; the City of Nashville, Tennessee; Louisville, Kentucky. We were looking at plants of, at least, comparable size in the national vicinity. The only one I found that was surcharging on ammonia at that time was the Knoxville Utility Board.

Q I don't understand how that provides a comparison to what we are talking about here?

A The purpose in a surcharge is to recoup your costs, and it's not just your operating costs.

Q Isn't sometimes a surcharge also imposed to discourage industrial users from going over a certain effluent limit?

A It is -- while it might be a discouragement,

it is to recoup their costs.

Q Let's move on. Now you stated that the ten alternatives you provided to review in this case are all -- are the -- I believe the word you used was "proven"?

A Proven.

Q Proven technologies for providing nitrification, correct?

A Proven technologies for reducing effluent ammonia.

Q Okay. Thank you. I want to get that very clear. These are all proven technologies? We are not looking at experimental technologies, or --

A Exactly.

Q And they are technologies that are all in place somewhere?

A Yes.

Q And have you worked with all of them personally?

A In my resume the ones that you see that I have worked with personally from a design go to full-scale implementation, go to full-scale operation, have been nitrification, biological nitrification and breakpoint chlorination. All the others I have

evaluated on a bench scale treatability basis in order to develop conceptual level designs and cost estimates so the client themselves could see what their alternatives were for reducing effluent ammonia-nitrogen. So I have done that on other projects as well this one.

Q So wouldn't it be fair to state then, Mr. Flippin, that each of these technologies listed in your testimony from a design standpoint are technologically feasible to implement for reduction of ammonia-nitrogen?

A Can they be built? Yes.

Q Thank you. That was all I wanted to know for that question.

Now like I asked, I think in the clarification that the figures that -- sorry, or the technologies that you list in Exhibit 11 are the same technologies that you go through the cost with in 1 through 10, numbered 1 through 10. And they are the same technologies that you were looking at in Exhibits 12 and 13 that provide more detailed cost?

A That is true. The same technologies were carried through.

Q At this point I would like to just sort of

ask you a number of questions about your cost figures. I am not an economist, that's for sure. And so a lot of these terms are somewhat unfamiliar to me so I would appreciate a little bit of explanation about how you derive them and maybe about what some of them mean.

Now with regard -- you discussed use of a contingency. And you use a contingency in both the capital component and the operating component, correct?

A I did.

Q And it sounded very logical to me what you testified that, oh, it's always true that you miss something, right? I mean, that certainly makes sense to me. How did you come up with a figure 15 percent?

A When you look at a project and you look at where it will be installed and you look at what surrounds it and you look at the complexity of what you are going to install, it derives what type of contingency should you allow.

Q But wouldn't that have been different for each of these alternatives, then, if that was the case?

A Thankfully the land where these would be installed is essentially the same location. So that made the uncertainty about location comparable to all. It made the concern about proximity to other pieces of

equipment common to all. It made the uncertainties about power, of delivery being in the same location, it made that uncertainty common to all. And so the 15 percent you see there for capital cost contingency is one based on this project and what was involved seemed to be a reasonable value to apply.

Q But it pretty much was just your guess of what seemed like a reasonable value? You didn't look to a book, or --

A Actually, what I looked to were construction cost estimators employed within our company that do these type of cost estimates frequently. And they are in a better position to make that determination than I am.

Q What else did you use to develop this?

A Pardon?

Q Are you talking about a model that's used at your company or a person? I guess is my first question.

A For developing construction cost estimates we certainly have people.

Q Right.

A Construction cost estimators. We also have a model that includes our historical knowledge of what it costs to install various pieces of equipment, et cetera,

et cetera. And so when looking at this project and hearing me describe to them the locations, the distances between units, the distance to substations, what other projects had been built in that same area, if you will, I relied upon their judgment as to what level of contingency should be applied. And what I have explained earlier are the factors that they considered. And the 15 percent value that you used there was considered reasonable. And in my dealings in these type of estimates, that is not an unreasonable or unusual number.

Q So what would be the range?

A Contingencies?

Q Yeah.

A I don't think anyone would apply a contingency smaller than 5 percent. I think, depending on the uncertainty, that contingency can be as high as 25 percent.

Q This is all still very fuzzy to me, I guess. I don't suppose we are going to have a witness to testify about what goes into that model and how those numbers were derived then? You relied on them, but they are not going to be here to provide that information?

A I certainly reviewed their construction cost

estimates. And I certainly took the information that they provided in those estimates and placed that information in these tables.

Q So you did place them in the tables yourself?

A I did.

Q Why did you choose a different contingency for O and M?

A On operation and maintenance costs, the good news about operation and maintenance costs, is there is less uncertainty there than in the actual capital installed costs or construction cost estimates. So that's why you see a lower contingency there. Now why is there contingency still there? One thing is you will notice that the cost of chemicals that you see me providing were the cost of chemicals that Noveon provided -- was paying at the time of this estimate. Chemical --

Q So these are chemicals they currently use already?

A The 50 percent sodium hydroxide is used today. Sulphuric acid is used today; phosphoric acid is used today. And so those chemicals are used today.

Q So you based that cost on what they pay?

A On what they paid at the time of this

estimate.

Q You stated that they had been able to negotiate very good prices for those, correct?

A Yes. In comparison to other cost estimates I have done, yes.

Q Can you give us some perspective on that? What you mean by that?

A What do I mean by that?

Q 10 percent, 15 percent cheaper than other companies?

MR. KISSEL: What is the question? I'm sorry. I was distracted by my compatriot.

MS. WILLIAMS: I'm just asking -- he stated that they have negotiated very good rates. And I asked for some perspective, how much better than other facilities?

MR. KISSEL: If you know.

A For example, it's interesting at the time there is a publication called the Chemical Marketing Reporter that we use within our company where if we are working with a client who is going to be using a new chemical that they don't currently use, a Chemical Marketing Reporter is a common document one refers to to get the cost of a particular chemical. Let's just take, for example, 50 percent caustic. If at the time this

cost estimate was developed Chemical Marketing Reporter would have had you believe that you should pay about 300 to $350 a ton for 50 percent caustic. And, yet, you will see the number that I used was $240 a ton, and that is what Noveon was paying at the time.

Q I suppose it would make sense, though, wouldn't it, they have gotten these good rates, if they increase the amount they buy they might be able to negotiate better rates, wouldn't they?

A There is two things that drive costs, of course, one is availability and one is usage.

Q Supply and demand, is that what we call that?

A Exactly.

Q Let's talk about some of these other ones. You give an estimate for gas and electric. What's that one based on?

A The gas and electric was based on contacting Noveon and asking what is a reasonable value to assume for electrical costs and to use -- to assume for natural gas costs.

Q Based on what they currently contribute to PolyOne, or how do they -- based on what they currently pay to run the plant?

A Right. Based on their current -- based on

their cost of electricity and cost of natural gas at the time of these estimates, I simply ask, What is a reasonable value for me to use in these cost estimates for electrical and natural gas?

Q Do you know if they buy those off the market?

A I don't know how they purchase natural gas or electricity.

Q But wasn't their testimony that -- yesterday that they shared utilities with PolyOne?

A They do share utilities with PolyOne as it equates to steam. They testified to that. As it relates to river water treatment, they testified to that. As far as electrical and natural gas, I don't remember them testifying to that.

Q So you are not sure those figures are based on buying it off the market or not?

A I don't know how they buy natural gas and electricity.

Q Would we have to ask Mr. Giffin about that?

A Or Mr. Davids.

Q Mr. Davids, okay.

How about your labor costs, $40 an hour; what's that based on?

A Again, based on contacting Noveon and saying,

I need a labor cost including salary and benefits, what values should I use that's reasonable. And $40 an hour is a value that was supplied to me.

Q And the only reason I'm requesting at all -- we all understand the cost of benefits is pretty substantial, but they did provide a figure elsewhere in the petition of $23 an hour of being the average salary in the plant. So was this a precise figure of the difference between that $23 an hour and these benefits?

A If you will, Mr. Davids could testify to that.

Q Was he the person you went to directly when you wanted to get figures to plug into this table?

A Yes. And Mr. Giffin.

Q The next thing, I want to ask about labor; and the last thing I want to ask about labor is, do you assume for most alternatives, I think all of them except 1, 15 hours -- 15, did you call them man-hours -- 15 hours of labor a year to operate 1,500? On exhibit -- turn to Exhibit 12. It looks like there is some variety, but looking at Exhibit 12 the Labor Hours line I think I was looking mostly at the second page where they all were 1,500. The first page they do range, several are 1,500, correct?

(Pause in proceedings.)

Q Is my question unclear?

A No. Your question is not unclear. I'm just looking at the alternatives and what labor hours are associated with them. 1,500 labor hours were associated with alternative 3, alternative 5, alternative 6, alternative 7, alternative 8 and alternative 10, when complete treatment was provided.

Q And 1,500 hours comes out to about 30 hours a week over 50 weeks. So, presumably, this would involve having to hire another full-time person under each of these alternatives 3, 5, 6, 7, 8 and 10?

A If you notice, if we were hiring a full-time person, we would have put 2,080 labor hours. So it does not represent hiring a full-time person. It represents using people that are already on staff or using a portion of a person, if you will.

Q People who are already being paid either $23 an hour or that plus something, maybe 40, including benefits, correct?

A For these labor hours.

Q When you give us the final figures on page 3 of Exhibit 11, the total at the bottom present worth costs, you say they are based on a 10-year period which

you discussed in your direct examination, and you also say they are based on 8 percent interest and no salvage value. Can you tell us, why did you do that? What did you base the 8 percent figure on, and why did you assume no salvage value?

A Would you please show me which exhibit you are referring to?

Q This is the same one from May 17th. I'm sorry. Page 3.

MR. KISSEL: Here you go.

THE WITNESS: Thank you.

MS. WILLIAMS: Like I said, if I jump around too fast, just holler.

THE WITNESS: That's okay. And the question again?

Q What did you base the 8 percent interest figure on? What did you base your decision to use no salvage value?

A In May of 2002 the interest rate which one could get, if you will, or make on your money. In this case 8 percent was considered by me, based on available interest rate data at the time, to be a reasonable value.

Q At what time was it based on?

A May 17th of 2002, just prior to that as I was

preparing this document.

Q That's what the interest rates were at that time?

A That's what I believed one could make, in fact, on their money.

Q Would that change at all if you were doing this today?

A If we were doing this today, I would certainly have to revisit that.

Q What about the no salvage value?

A The no salvage value if you -- anyone who has operated wastewater treatment facilities and have finished operating them and then closes it -- and then you closed them down for some reason, there is just not much of an aftermarket value on wastewater treatment equipment.

Q Oh, I would buy it, wouldn't you?

MR. LATHAM: We will sell it to you.

Q But not nothing is it usually? Nothing?

A Well, I will be honest with you, we are working on a project now in San Diego where a utility company shut down their operations next to one of our clients and said, You are welcome to have any of this equipment if you will come get it.

Q Did you go get it?

A We are still looking to see what pieces we can use.

Q On the first page of that same exhibit you talk about the information that you based your analysis on from the plant, operating information, right? I guess the design parameters; is that the right thing we call it, when you give flow rate?

A Are you looking at table 1, please?

Q Table 1, influent and waste load, yes.

A This is the design waste load, and I don't call this the design untreated waste load because, again, due to the recycling of solids through the PVC tank. But this is the design waste load which we looked at all the alternatives with.

Q And for a flow rate for the design waste load you get an average of 401? Oh, no, I'm sorry, an average of a total of 560?

A Yes.

Q And a peak of 769, correct?

A Yes.

Q Where did you get those figures from?

A We did an individual waste stream data gathering and data -- we did an individual waste stream

characterization program in 1995 which provided the basis for this table.

Q Is that something that you can submit to the Board to help them in making their decision?

A The information is summarized here in table 1.

Q The information is summarized, but the data, is the data something that you can provide to the Board or to the Agency for that matter?

A Yes. We could find that data and provide that data.

MR. KISSEL: I'm not sure. We would have to evaluate whether it's necessary. And this information has been available to the Agency for some time. And we don't think it's necessary for the Board to make its determination unless they disbelieve Mr. Flippin. He has made the determination. He has relied on data. And at this point I would not intend to present it to the Board unless asked to do so by the Board itself.

HEARING OFFICER HALLORAN: Ms. Williams?

MS. WILLIAMS: I would make the suggestion to the Board that they consider asking for the data on which these numbers are based themselves. And that's up to them whether they want to do it or not.

HEARING OFFICER HALLORAN: This information has been available for some time?

MS. WILLIAMS: I'm not aware of that. I don't think we have that information.

MR. KISSEL: This table has been made available.

MS. WILLIAMS: The table has been, but the data on which the table was derived from. I'm not aware of it. I don't know what form it's in. You might have gotten it somewhere in the boxes.

MR. KISSEL: That's not what I said. I said the Agency has had this table for a long time, and we have never received a request for the back-up information. And, presumably, they used that to evaluate for our Petition for Adjusted Standard. There was never any request or need, from our point of view, from them that they needed those data. I think it comes as rather a surprise at this hearing to ask for that now.

HEARING OFFICER HALLORAN: What exhibit are we talking about the data was for?

MR. KISSEL: Exhibit 11.

HEARING OFFICER HALLORAN: I will take that up at a later date.

MR. KISSEL: Thank you.

HEARING OFFICER HALLORAN: How much more testimony

or cross -- I hate to interrupt, Ms. Williams, but are you -- I'm not being sarcastic -- are you almost finished? I'm trying to push this thing today because I don't think lightning can strike three times. I'm not sure we can get the courtroom tomorrow. So I'm trying to get as much finished today.

MS. WILLIAMS: I think both parties agree Mr. Flippin is Petitioner's primary witness that will take longer than everybody else. I would say I'm approaching the end. I have one major line of questioning I haven't even started, but I wouldn't say it would take more than 15.

HEARING OFFICER HALLORAN: We have redirect and the technical people may want to ask some questions.

(Whereupon, a recess was taken and Jennifer Johnson resumed as the court reporter.)

HEARING OFFICER HALLORAN: All right. We're back on the record. It's February 18th, approximately 11:15. We did start this hearing -- excuse me, 11:20. We did start this hearing at 9 a.m., and Miss Williams is continuing with her cross on Mr. Flippin.

MR. KISSEL: That clock is about five minutes off. It should be 11:16.

HEARING OFFICER HALLORAN: 11:16. Thank you.

CONTINUED CROSS-EXAMINATION

BY MS. WILLIAMS:

Q. Mr. Flippin, we talked a little bit just before we went off the record about man-hours and how many you used in your cost estimates. In your testimony, you talk about the fact that you've been doing work for Noveon and, prior to that, BF Goodrich since the mid '80s, correct?

A. Actually, since 1988.

Q. So, late '80s. Do you have an estimate at all of how many man-hours you've worked on this facility?

A. I do not.

Q. Would it be more than 1500, less than 1500? I'm picking it arbitrarily, but something to give us an idea of about how many.

A. Please bear in mind that I've been working

there since 1988, and the longest elapsed time that I haven't been on the site has been about two years since then. That's a lot of years and a lot of site visits, a lot of work at my desk, a lot of work in the field.

Q. How about money; do you have an estimate of how much money the client has paid your company over that period of time?

A. I do not.

Q. Not even a guess?

A. Honestly, that side of the -- that side of our practice I don't really spend much time on.

Q. Could you tell us if it's more or less than the alternatives you described here for treatment?

MR. KISSEL: I'm going to object. I think we're really trying to get into speculation again.

MS. WILLIAMS: Well, I didn't expect that he wouldn't have any --

BY MS. WILLIAMS:

Q. Can I ask Mr. Davids; do you think he would know how much he paid your company over that period of time?

HEARING OFFICER HALLORAN: You know what? I think -- as in the case of your witness yesterday, Ms. Williams, I think this witness today has asked and

answered the best he could.

MS. WILLIAMS: That he just doesn't know?

Can I ask again if there's someone who would know?

HEARING OFFICER HALLORAN: Yes, you may. I would sustain Mr. Kissel's objection.

BY MS. WILLIAMS:

Q. Is there someone that would know?

A. I could certainly go to our accounting staff at Brown and Caldwell and, and pull that information up. I'm sure Noveon could go to their accounting staff and pull that information up as well. I just don't know it.

Q. You just don't know. In all that time, in all the different work that you've performed, did any of the work that you performed for Noveon involve completing of construction permit applications?

A. It did not.

Q. And presumably not -- nor operating permit applications either?

A. It did not.

Q. And Mr. Giffin testified yesterday about some source reduction activities that were undertaken by Noveon?

A. Yes.

Q. Were you involved in those activities?

A. I was not.

Q. I would like to ask you some questions now about your testimony and about Exhibit 13 -- 14? 14. Sorry. Exhibit 14.

Now, in summary, I take this exhibit as saying that -- trying to demonstrate, I guess, that you feel the PE of this facility is calculated at a figure less than 50,000, correct?

A. That's true.

Q. And what is the significance of that?

A. I believe that the Illinois -- 35 Illinois Administrative Code Standard 304.122(a) and (b) do not apply.

Q. And by "not apply," what you're saying with regard to 304.122(a) is that you believe the facility does not trigger the 50,000 PE applicability threshold?

A. That is true.

Q. You do believe that that's the section that would cover them, among the two sections?

A. That is true.

Q. And your testimony is that subsection B which limits -- has an applicability threshold of 100 pounds per day discharge does not apply, correct?

A. That is true.

Q. And if that section did apply, they would trigger that threshold, correct?

A. If that section did apply.

Q. Right. So, the basis of this exhibit is to explain to the Board why you concluded that under subsection A they wouldn't have to treat for ammonia because they don't trigger the threshold?

MR. KISSEL: Let me interject here so we can put this in perspective and take just a second --

MS. WILLIAMS: Is that an objection? Are you objecting?

MR. KISSEL: No, I think it's important to know --

HEARING OFFICER HALLORAN: I'll allow Mr. Kissel to state his case.

MR. KISSEL: I mean, what we did was we asked -- we wanted Mr. Flippin to testify on the permit appeal. Included in that testimony was a, a detailed explanation of why there was less than 50,000 PE, and the objection was made to that testimony and sustained that no information post-1991 would be admitted into evidence. We knew about that before we came to the hearing yesterday.

As a result of that, we asked Mr. Flippin to

look at pre-1991 information, which he did, and put together Petitioner's Exhibit 14 which was introduced, which was accepted in evidence, and on which there was cross-examination on the permit appeal. I just want the Board to -- if I --

MS. WILLIAMS: But why was it submitted today then?

MR. KISSEL: To make sure that it's in the record so that the Board has all of the information, just as the reason we've asked the Hearing Officer to include the entire -- if the transcript of the other record had been included, we would not have had this. But -- and I'm not being -- by this trying to find fault or say somebody made a wrong decision or whatever it is, but it was important because it was documents and information that had been reviewed, and I thought that -- in the adjusted standard hearing we thought that the Board should have this information. That's the reason this is there. It would not have been there except for reasons I've stated.

MS. WILLIAMS: Okay.

HEARING OFFICER HALLORAN: Ms. Williams?

MS. WILLIAMS: I -- do you want me to continue, or do you want me to -- I don't really have anything -- I guess you're trying to explain my

characterization or he has a right to explain his characterization. I don't think it reflects on my questioning.

MR. KISSEL: I'm just trying to say from the public's point of view -- because the Board will review the entire record. But from the public's point of view, this is not the only document that Mr. Flippin has prepared --

MS. WILLIAMS: Okay.

MR. KISSEL: -- to deal with the 50,000 PE.

MS. WILLIAMS: This in combination with his testimony.

MR. KISSEL: Right, right.

MS. WILLIAMS: Exactly.

BY MS. WILLIAMS:

Q. This in combination with your testimony. I think it's like page 12 and 13, right?

MR. KISSEL: Right. Or whatever it is.

BY MS. WILLIAMS:

Q. Page 12 and 13 of your testimony --

MR. KISSEL: Okay.

Q. -- together are there to show your belief, right?

A. (Witness nods head.)

Q. Okay. I'm sorry if I -- I wasn't trying to limit you to just what was in that exhibit regarding pre-19-- we're going to look at all your figures.

I have to tell you I'm a little confused about the figures that appear in your testimony. The reason I asked the questions about Exhibit 11 and where that information came from is that information made sense to me as far as the flow values provided, BOD values provided, COD values provided. That struck me as being within a range of figures that I had seen before on this facility. These figures don't look anything like that.

MR. LATHAM: Can you help us?

MS. WILLIAMS: Sure. The figures on page 12.

MR. LATHAM: There's a lot of figures.

MS. WILLIAMS: Well, it's a little complicated how he does it.

BY MS. WILLIAMS:

Q. I believe it adds up to a total flow value of 265.6 as a total flow value for all four waste streams. Now, you calculate them individually, I think, but the total flow -- you don't -- when you total things out, you don't total for us what you have as a flow for gallons per minute, but I believe the flow total here is 265.6. Is that correct?

MR. LATHAM: Where?

HEARING OFFICER HALLORAN: I'm on page 12 of Mr. Flippin's testimony.

BY MS. WILLIAMS:

Q. Adding up the four items, the four bullet points, the first four bullet points. The fifth bullet point is the total. Do you see that?

HEARING OFFICER HALLORAN: Okay. Starts on page 12.

MR. KISSEL: Bottom of 12.

BY MS. WILLIAMS:

Q. So, there's four bullet points where you break down the waste streams, correct?

A. Here we go. What I do on pages 12 and 13 of the testimony is I use data that was provided to me by Mr. Davids, and in this I summarize what Mr. Davids provided me for the period of July 2002 through June of 2003.

Q. July 2002 to what?

A. July 2002 to June of 2003.

Q. One year's worth of data, correct?

A. Yes.

Q. One year's worth of data on effluent?

A. If you will, on the PVC lift station, that --

that is an untreated PVC waste stream discharge. It has no effect of return solids in it, and that's extremely important because population equivalents are to be calculated on the untreated raw waste load.

Q. And you got a figure of 133 gallons per minute for that?

A. Yes. Mr. Davids did, in his summary of the data that he provided me.

Q. Now, in Exhibit 11 you tell us that the total flow for that waste stream, you call it something different. You call it the --

A. PVC tank discharge.

Q. Discharge. Is 401 gallons per minute?

A. That is correct.

Q. And are you trying to tell us the difference between those figures, 133 and 401 gallons per minute, is all based on recycled solids?

A. Very well may be.

Q. Twice the process flow rate is responsible for the recycling of solids?

A. Very well may be.

Q. Does that make sense to you, Mr. Flippin, in your professional opinion?

MR. KISSEL: I'll object to that.

HEARING OFFICER HALLORAN: Objection sustained.

MR. KISSEL: Okay.

BY MS. WILLIAMS:

Q. Do you agree with those figures that Mr. Davids provided you as being credible?

A. I have no reason to doubt Mr. Davids' ability to summarize waste load information.

Please, please bear in mind several things: First, what goes back to the PVC tank -- this audience did not have a chance to hear that, but I think it's relevant to the audience. What goes back to the PVC tank, if you will, is effluent sand filter backwash water. To give you a feel for that, it's highly common for those values to be as high as 15 percent of the forward flow going to those units, if not higher, depending on the solids loading going to them.

Q. Do you have a calculator up there?

A. I do. I'm not finished, though.

Q. Well, I think you answered that.

MS. WILLIAMS: Has he answered the question?

MR. LATHAM: He's still answering the question.

A. I'm still answering the question.

Q. The question was what?

A. Why is there a difference between the PVC tank discharge flow rate and the PVC lift station flow rate?

Q. I think I asked you if it made sense to you, but you're right; go ahead.

A. Okay. First, you have an effluent filter that's discharging backwash water. Again, common, common discharge backwash water rates are as much as 15 percent of the forward flow and even higher if the solids loading to those filters is high and the condition of the filter warrants more frequent backwashing.

Secondly, what also goes to the PVC tank is when the filter -- when the filter press is dropping cake, the primary clarifier underflow goes back to the PVC tank.

Next, the pond water can be, as I've testified earlier, diverted to the PVC tank.

Q. And you don't count that in your values when the pond water's included?

A. In the pond water sample that you -- in the pond water value that you see here, that is the pond water flow rate not going through the PVC tank.

Q. But it does go through the PVC tank; you didn't count it as part of your flow?

A. I didn't count it twice.

Q. You counted the total in the other? No?

A. Where you see pond water listed --

Q. Okay. Now you're losing me. Where you see it listed in your testimony or in your exhibit?

A. I did not count pond water twice. If pond water went to the PVC tank, it's included in the PVC tank flow. If it did not go to the PVC tank and went through the filter prior to discharge, I counted it as pond water in that category.

Q. So, pond water is included in this 133 gallons per minute to the extent it went to the PVC --

A. It is not because pond water does not go through the PVC lift station.

Q. So, it's in this 94 gallons per minute if it went to the PVC tank?

A. If you will, pond water is -- the flow rate for pond water is not included -- is not included on pages 12 and 13.

Q. Okay. Thank you. I'm sorry for that confusion. So, it's not included in the total?

A. (Witness nods head.)

Q. You said you had a calculator? Would you mind adding up for us the total flow that you used in coming up with these PE values?

A. I did, and the value I get from summing what you have here is what you reported earlier, 265.6 gallons per minute.

Q. Can you tell us what Noveon reports its flow to the Agency as in its discharge monitoring reports?

A. I have not reviewed Noveon's discharge monitoring reports in some time.

Q. Would it be more or less than 265 gallons per minute?

A. It would be more than 265 gallons per minute.

Q. What would happen if the Agency was to write an NPDES permit for this facility based on this flow value of 265?

MR. KISSEL: I'm going to object to the question as being speculative.

HEARING OFFICER HALLORAN: You know, I'm going to overrule it. If Mr. Flippin can answer it, he may.

A. I don't really understand the question.

Q. One moment, please.

So, would you say the remaining difference between the flow value that you provide here, 265, and the figure in Exhibit 11 of an average of 560, is that difference something you would describe as dilutional flow, or what would you call that difference?

A. It's other -- it is other process waste waters, and it -- and it can be, on occasion, potentially contact storm water. And you're also missing in this the flow from well number two as well.

Q. What impact would a flow value like this 265 have on the mass limitations under the OCPSF regulations in their permit if these values were used? Are you aware of what would happen?

A. If, if you would restate your question, I'd appreciate it.

Q. You're familiar with the OCPSF regulations, correct? We talked about those yesterday.

A. Unquestionably.

Q. Okay. And you're aware that mass limitations are calculated based on those?

A. I am.

Q. Do you know what would change about those mass limitations if this flow value were used rather than something more akin to 560 gallons per minute?

MR. KISSEL: I again object as to speculative. The discharge from the plant has been well documented, and a permit's been issued on that basis.

HEARING OFFICER HALLORAN: Ms. Williams?

MR. KISSEL: And I think she's trying to

find --

MS. WILLIAMS: They're asking us to accept a flow value half of what's been used to calculate the PE.

MR. KISSEL: That's simply not the case. That's simply not the case. That's a mischaracterization.

MS. WILLIAMS: And I'm trying to understand if you take his flow value and use it for everything what impact that would have on the plant.

HEARING OFFICER HALLORAN: You know what I'll do? I will allow that question to stand.

I would ask the Board to note Mr. Kissel's arguments. If Mr. Flippin can answer, he may.

BY MS. WILLIAMS:

Q. If you can.

A. I candidly believe it would be inappropriate to, to use a flow of 265.5 gallons per minute in developing an effluent permit because it does not include all of the streams that are regulated by OCPSF.

Q. And I don't disagree with you, Mr. Flippin. I'm just trying to understand why what has been presented to me as a very simple calculation, PE -- yesterday we talked quite a bit about what a simple calculation PE is. You take flow, you take BODs, you take suspended solids, you multiply them by multipliers, and you get a very

simple figure.

And this information you've provided in your testimony is not at all to me a simple calculation.

MR. KISSEL: I'm going to object as speculation. I don't think the questioner understands what those numbers represent as to what the discharge is. I think that's the whole difference. You're comparing apples and oranges.

HEARING OFFICER HALLORAN: It sounds like Mr. Flippin cannot answer the question Ms. Williams has put forth, and I would take note that he, in the best of his ability, has asked and answered it the best he can, so we can move on.

BY MS. WILLIAMS:

Q. The figures that you did reach, can you just tell us today, since we didn't go through this in your direct, what the range is; what figures did you find for PE under this method?

A. The population equivalents that I calculated -- I should first say that I stated prior to this calculation the streams that were not included in this calculation and referred the reader to the Baxter and Woodman report to see that information.

In calculating the population equivalents that

I did calculate, using what's written on pages 12 and 13 of my testimony, I got population equivalents for suspended solids of 24,955 population equivalents.

Q. And you state in your testimony this is much less than the PE of 265,000 calculated by the Illinois EPA, correct?

A. I do say that.

Q. My understanding of your testimony is that you chose to use different flow values than the EPA used, correct?

A. I chose to use untreated waste load values.

Q. Untreated waste flow values, meaning what? Why don't you define that for us?

A. Be glad to. The reason I believe that the Illinois EPA calculated so much higher of a population equivalent for total suspended solids is the Illinois EPA used PVC tank discharge solids which are -- which are inflated because of the presence of recycled solids within the wastewater treatment facility.

A proper calculation of population equivalents has to use untreated waste load information that excludes streams that are merely recycled within the wastewater treatment facility.

Q. And Mr. Davids is the one who explained to us

specifically for each waste stream what component the recycled solids make up, or are you able to explain that for us?

A. What, what Mr. Davids was able to do for me -- and it was critical to the calculation -- was to go upstream of the PVC tank where all of these recycled solids enter and give me what is the true untreated waste load solids load going into that tank was, excluding recycled solids. I had to have that to calculate a population equivalent accurately.

Q. And based on -- I mean, you would agree, though, that using the figures of Baxter and Woodman -- I mean, I take your testimony that that's inappropriate under your testimony. But --

MR. KISSEL: Again --

Q. -- you don't disagree with the accuracy of this 265,000 on a pure mathematical basis?

If you take the flow Baxter & Woodman provided and you plugged it into the calculation based on the TSS values he provided, this is the figure you would get, correct?

A. It wouldn't be a population equivalent.

Q. No, but this is the figure that he -- well, we can -- you're saying it wouldn't be a population

equivalent because why?

A. It has -- it is not based on an untreated waste load information which is required by population equivalent calculation.

Q. Okay. But you don't dispute the math?

MR. KISSEL: I'm going to object. I think we've been over this. For an issue which the Agency says is not relevant to this proceeding, we've spent 40 minutes on it.

MS. WILLIAMS: That's exactly what I warned you of an hour ago, so --

MR. KISSEL: That wasn't -- I don't -- I didn't hear the warning, I guess. But in addition, that question's been asked and asked, and I think the Agency is unsatisfied with the answer because it doesn't meet with what they want. But he's answered the question -- questions.

MS. WILLIAMS: I think he -- did I ask it over and over? I thought I asked the question once and he answered, but that's fine.

HEARING OFFICER HALLORAN: I've heard it at least once. But if you want to state it one more time, I think I've heard the question once and the answer at least once.

MS. WILLIAMS: Okay. The question about whether he disagreed with the math?

HEARING OFFICER HALLORAN: I'm sorry?

MS. WILLIAMS: With whether he disagreed with the math of the calculation?

HEARING OFFICER HALLORAN: Correct.

MR. KISSEL: Can we -- what is the math? Give him the equation and let him tell you whether -- to use his computer rather than speculate.

MS. WILLIAMS: Sure.

MR. KISSEL: I think, Mr. Hearing Officer, we can agree and we can perhaps work it out --

MS. WILLIAMS: Maybe we can stipulate that based on --

MR. KISSEL: -- that if you divide four by two, you get two. I'll agree to that. Or whatever the number is. We don't disagree with -- I don't think Mr. Pinneo who, I think, did the calculations used a bad computer. We'll check it, but I don't think he did. We certainly --

MS. WILLIAMS: Are you willing to stipulate that, as we presented in our discovery, those numbers --

MR. KISSEL: I'm willing to say that whatever the number -- the division is, we do not agree that it is

a PE for that plant. Absolutely, unequivocally. Is that okay?

MS. WILLIAMS: Absolute fine. That's all I was trying to establish.

HEARING OFFICER HALLORAN: Okay. The record should reflect that it is so stipulated, and we can move on.

MS. WILLIAMS: I think if I can confer for about one minute, I think we're done.

Okay. We're done with this witness. Thank you for your patience, Mr. Flippin. I appreciate it.

HEARING OFFICER HALLORAN: Mr. Kissel, redirect?

MR. KISSEL: Do you want me to wait until the Board has -- it's the Board's discretion.

HEARING OFFICER HALLORAN: You know, I don't know. Maybe.

MR. KISSEL: I just have a very short.

HEARING OFFICER HALLORAN: What do you think? Have Mr. Kissel wrap it up and then --

MEMBER MELAS: It's up to you.

HEARING OFFICER HALLORAN: Let's finish up.

* * * * *

REDIRECT EXAMINATION

BY MR. KISSEL:

Q. Okay. Mr. Flippin, during the course of your cross-examination, I guess, you were asked the question of whether the technologies that are listed in the various exhibits for reducing ammonia in the effluent from the Noveon plant were technically feasible. And you answered -- I believe I'm quoting you correctly -- they could be built. Would you like to explain your answer, please?

A. I would. I would like to explain my answer.

Q. How did I know that?

A. The -- candidly, any of these ten treatment alternatives can be built. That's not the issue. The issue is, when it comes to technical feasibility, there's more involved in whether or not you can build something. What's involved is how reliable is it and what performance will it achieve and what is involved in keeping it running.

And several of these technologies presented pose operational concerns that render them difficult, at best, to operate; and some of these, if you will, render themselves limited by what is present in the wastewater.

And let me explain. Take, for example, ion exchange. The salt concentration that you'll hear in

later testimony is high. And so when you put in ion exchange, you just aren't removing ammonia; you're removing a lot of competing cations. And so the frequency of ion exchange regeneration will be extremely frequent.

Take, for example, some of the struvite precipitation. Can it be done? Sure can. It generates tremendous quantities of sludge and only provides a nominal effluent ammonia reduction. So -- and I have prepared as an exhibit, and it's been entered, a whole discussion of reliability, of what's involved, of pros and cons; and I think those things have to be considered if you're going to discuss technical feasibility.

And that comment was not made when I said, sure, they can be built. And that's basically what I'd like to communicate.

Q. Thank you.

MR. KISSEL: That's all I have.

HEARING OFFICER HALLORAN: Thank you. Any recross, Ms. Williams?

MS. WILLIAMS: No, thank you.

HEARING OFFICER HALLORAN: Okay. Personnel of the Board, Member Melas, do you have any questions to pose to this witness?

MEMBER MELAS: Yeah. Mr. Flippin, last

evening as I was going through this testimony of yours -- I might say, a very thorough job -- one question comes into my mind. At one point, you're talking about total discharge from this plant at 800,000 gallons per day; and in the breakdown, 360 come from PolyOne, and 180 from Noveon. That leaves 260 gallons per day that I am not quite sure of where they come from.

THE WITNESS: Thank you. And that is -- the documentation of where that comes from has been provided; I believe Miss Deely's going to get that.

MR. KISSEL: Can you describe it some before, while she's doing that?

THE WITNESS: I would prefer, Dick, to have that in front of me.

MS. DEELY: We prepared a written document responding to all the questions you submitted to us, and I guess we can ask that that be submitted as an exhibit. I just have to find it.

MR. KISSEL: Miss Deely is referring to a document we received from the Board, Mr. Melas, Board Technical Staff.

MEMBER MELAS: Yeah, I have that.

MR. KISSEL: In response to that, we have -- if we can find it -- Sheila, is it --

MS. DEELY: Yes.

MR. KISSEL: Is that the right -- Sheila, is that the final one or --

MS. DEELY: Yes.

MR. KISSEL: Okay.

MS. WILLIAMS: Can we hold on until I can get a copy, too, or are you just using it to refresh your recollection?

MS. DEELY: I believe he's just --

MR. KISSEL: We're not introducing it as an exhibit at this point.

MS. WILLIAMS: Okay. That's fine.

THE WITNESS: It's a good question, and the -- what was excluded was well number two discharge which is 10 gallons a minute. The, the water coming from the pond that goes through the sand filter before it combines with the final outfall of 30 gallons a minute, pond number one's flow, if you will, that also was being discharged to the facility and the filter backwash water, which was 70 gallons a minute, and the filter backwash water coming from the tertiary filter of 70 gallons a minute, when all added together equals 180 gallons a minute or 260,000 gallons a day.

MEMBER MELAS: From all those various sources?

THE WITNESS: Yes, sir. Yes, sir.

MEMBER MELAS: Most of them -- not all of them, but most of them internal to the plant itself?

THE WITNESS: Yes, sir.

MEMBER MELAS: The well, I don't understand where that -- what's the significance of that well?

THE WITNESS: The well is a -- is a recovery well and is being treated in the wastewater treatment facility.

MR. MELAS: Okay. All right. Has that document been sent to us?

MR. KISSEL: Yeah, we have re -- we have prepared a response to the Board's questions.

MEMBER MELAS: Okay.

MR. KISSEL: We'll probably ask that it be entered into the record as our response, but clearly the Board will have a copy of that.

MEMBER MELAS: Okay.

MS. WILLIAMS: Not today?

MS. DEELY: Yes, today. Just when we moved, I don't know where it is, so --

MEMBER MELAS: Getting on to some of those other bullet points, Mr. Flippin, a number of them have the concept of stripping?

THE WITNESS: Yes, sir.

MEMBER MELAS: The first one, I think, was nitrification. So, when you do strip, convert the nitrogen from the liquid phase to a gaseous phase and it goes up in the air --

THE WITNESS: Yes, sir.

MEMBER MELAS: -- what kind of a problem does that create?

THE WITNESS: It, candidly, transfers ammonia from a -- it, candidly, transfers ammonia from being -- going out in your wastewater to simply going out in your air emissions.

MEMBER MELAS: And what effect would that have on the standard here in this area?

THE WITNESS: I'll need to defer that question to Mr. Giffin, who's worked on their Title V and other air permits.

MEMBER MELAS: Okay. The other thing that's -- on another matter that's -- that answer will come; I'm quite sure that I know what it will be anyhow.

There's been an awful lot of discussion about this population equivalent. Now, that is -- is that not generally something that is commonly known throughout the entire industry, throughout the entire country, wherever

you're talking about wastewater treatment plants? Isn't it commonly accepted methods of technology or calculation that will translate it into what's called PE?

THE WITNESS: Yes, sir.

MEMBER MELAS: And from the work that you've done, as I understand it, that's looking at page 12 and 13 here, you come up with your conclusion that there is no question that the population equivalent contributed by the wastewater of this particular plant comes to the 25,000 whatever number?

THE WITNESS: Certainly less than 50,000, yes, sir.

MEMBER MELAS: That was my only question.

HEARING OFFICER HALLORAN: Thank you, Mr. Melas.

MEMBER MELAS: I would defer to --

HEARING OFFICER HALLORAN: Miss Liu?

MS. LIU: It would be helpful, before we proceed with our line of questioning, to have the answers to the hearing officer questions.

MS. DEELY: Sure. Can we take a two-minute break? I don't want to disrupt everybody.

HEARING OFFICER HALLORAN: Sure.

(Whereupon, a recess was taken.)

HEARING OFFICER HALLORAN: Mr. Flippin?

All right. We're going to go back on the record. We took a few-minute break to find some documents. I believe our technical unit was going to pose some questions of this witness.

MS. LIU: Good afternoon, Mr. Flippin.

THE WITNESS: Afternoon.

MS. LIU: Could you please identify the address of your office with Brown and Caldwell?

THE WITNESS: I can. It's 501 Great Circle Road, Suite 150, Nashville, Tennessee, 37228.

MS. LIU: Could you also please identify the location of the corporate headquarters?

THE WITNESS: It is in -- it has recently moved. It is now in Walnut Creek, California.

MS. LIU: On page six of your prefiled testimony, you mention a C-18 waste stream that was previously sent off site for treatment?

THE WITNESS: Yes, ma'am.

MS. LIU: Would you happen to know why they no longer do that?

THE WITNESS: I do. I participated in conducting a treatability study that led to the design of a pretreatment facility that allowed the Noveon plant to

pretreat the C-18 wastewater in such a way that it rendered it treatable in the existing activated sludge system that they have.

MS. LIU: Using the pretreatment system, does a C-18 waste stream contribute to the ammonia in the effluent now?

THE WITNESS: The C-18 wastewater contains organic nitrogen compounds that would biodegrade and release ammonia into the wastewater, so C-18 does contribute nitrogen loading on the facility and, and should presumably contribute to the effluent ammonia.

MS. LIU: Would eliminating this waste stream again from the Henry plant have an impact on the level of ammonia that is now experienced in the effluent?

THE WITNESS: The, the contribution of C-18 to the total effluent ammonia load, candidly, is quite low. Would it reduce the effluent ammonia some? Most likely. Much? Not really.

MS. LIU: Could you quantify, please?

MEMBER MELAS: Just roughly.

THE WITNESS: I'll be glad to. I'd like to refer to -- and this was one of the reasons for doing the, the 1995 individual waste stream characterizations, and in that -- I'm turning to it -- it's -- I've got it here as

exhibit --

Dick, is that Exhibit 11? The May 17th, 2002.

MS. DEELY: Yes.

THE WITNESS: Thanks. C-18 -- C-18, on average, contributes 82 pounds per day of total Kjeldahl nitrogen, and the total Kjeldahl nitrogen going into the treatment facility is 1,038. So, if --

MEMBER MELAS: Okay. That's good.

THE WITNESS: That represents 8 percent. The C-18 wastewater contributes 8 percent of the total Kjeldahl nitrogen going into the facility.

MEMBER MELAS: May I just add, that sounds a heck of a lot better than "some" and "more" and "much."

THE WITNESS: Thank you. I apologize. I'll be more definitive in my answers.

MS. LIU: On page nine of your prefiled testimony, you mentioned the presence of bioinhibiting compounds that frustrate the nitrification process. And in the proven technologies that you discussed for possible treatment alternatives, you said that they would work much better if those bioinhibiting compounds weren't there.

In the Agency's recommendation on page 17, the Agency suggests that Noveon should have looked more thoroughly at the alternative of using granular-activated

carbon to remove those inhibitors before treatment. Do you know if Noveon looked into that at all?

THE WITNESS: Let me explain what we did do, and then I think it sheds light on granular-activated carbon usage. On page 18 of my testimony, we actually were running a continuous flow treatability study. Let me let you get there.

MEMBER MELAS: Okay.

THE WITNESS: We were running a continuous flow treatability study early on to look at what manner of pretreatment would be required to render C-18 wastewater treatable within the existing facility. And during that period, we noticed that even though we were providing ample alkalinity, ample dissolved oxygen, really warm temperatures, ample means of residence time, we were not getting any nitrification.

And so the question became, could we get nitrification if we were to add powdered-activated carbon to the activated sludge treatment facility. And what we found was the answer to that question was yes, we could get nitrification in our -- in our trial experiment by adding 5,000 milligrams per liter of powdered-activated carbon to the treatment facility.

At that dose, we would be using about 17 tons

a day of carbon, and we -- that made us realize two things. It made us realize that while carbon was removing the inhibitor, it obviously was removing a lot more because of the large dose required. And when you look at the C-18 -- sorry, when you look at the PC tank wastewater that contains C-18 -- sorry, that contains the primary inhibitor, we believe, which is mercaptobenzothiazole, in Exhibit 11, which I've referred to earlier, you'll notice that I list the PC tank as having an average flow rate of 107 gallons a minute and an average soluble COD of 8,280 pounds per day. That gives it a soluble COD, just by doing the math, of 6,440 milligrams per liter, so you've got -- what you've got is you've got a waste stream that's got 6,000 milligrams per liter of COD, a waste stream that contains the inhibitor, and you'll see in testimony on page 12 of this -- of my written testimony, you'll see that the PC tank discharge also has 900 milligrams per liter of total suspended solids.

So, our concern for -- the reason we did not look further at granular-activated carbon was several fold: One is we would have to remove the suspended solids from this waste stream before we, we placed it through a granular-activated carbon column. Number two, a waste stream that has 6,000 COD, if you will, and our prior

experience of seeing that a lot of the carbon went to removing other things than MBT, we felt like that the carbon usage on this system would be tremendous -- would be -- would be large. Maybe instead of 17 tons per day, the pack would have required -- maybe it would have been -- even if it was a fifth of that because of the driving force in isotherms and the way it passes through the column, we would have been in the multiple tons per day.

And because the PC wastewater not only contains an inhibitor and 6,000 COD, the good news is it also contains some readily degradable compounds like tertiary butyl alcohol and some other things that would be readily degradable. If we were to place that on a carbon column, we couldn't help it but turn that carbon column into an anaerobic treatment vessel and grow slime all over the carbon. And it would by no means, because of fouling, because of slime, and also this wastewater has a high salt content, we're bound to experience scaling on the carbon, too. All of those factors made us not look at carbon on the PC tank wastewater to remove the inhibiters.

MS. LIU: Thank you.

HEARING OFFICER HALLORAN: Mr. Rao, any questions? Oh, I'm sorry.

MR. RAO: I didn't have any questions of this

issue, but --

MS. LIU: Moving right along, in its recommendation, the Agency took the numbers that you had provided on cost figures for the treatment alternatives and tried to compare them with municipal projects that needed to remove ammonia from their effluent as well. They came up with some dollars per pound figure, but they did not go into the present worth cost calculations that you did, nor did they include the O & M maintenance costs. It makes it a little difficult to compare apples and oranges. The Agency says that the O & M costs that you document seem to be very significant, and I was just wondering if you could characterize why Noveon's O & M costs would be different than a municipality's O & M costs for the same type of ammonia removal?

THE WITNESS: I'll be glad to. Most, most municipalities, the nitrification that they provide is single-stage nitrification. And the good news about that is they're able to accomplish BOD removal and ammonia removal in the exact same tankage. And also the good news about it is most domestic wastewaters contain adequate alkalinity or almost adequate alkalinity to support complete nitrification without alkalinity addition.

Also, most municipalities, when you look at

the oxygen demand exerted by the ammonia versus the oxygen demand exerted by BODs, the oxygen demand exerted for nitrification, while important, if you will, does not greatly -- is comparable if not slightly lower than that for BOD demand.

In the -- the second thing is in municipalities, the alpha value for oxygen transfer, it's a lot -- it's easy, relatively easy to transfer oxygen into municipal wastewater in comparison to other industries.

And so what makes the single-stage nitrification at Noveon so much more expensive than municipal wastewater treatment plants and why is the operating cost and the capital cost so much greater -- I think that's the question -- and the answer to that is, the only way that Noveon can experience single-stage nitrification is to remove the inhibitors. The only inhibitor removal step that we demonstrated would work -- and so does the chemistry demonstrate this. The good news about MBT, which we believe is the primary inhibitor, the good news about it is it can be precipitated as you lower the pH. And we did experiments where we lowered the pH to 3, and then we lowered the pH to 2 and found that we needed to lower it to pH 2 to get the MBT low enough to

support single-stage nitrification.

You can imagine that when you're starting with a stream at 120 gallons a minute or 107 gallons a minute that naturally starts at about pH 10, when you lower it to pH 2 and go through a precipitation stage, clarifiers, solid separation, separate dewatering -- because you can't take what was at pH 2, combine it with other materials at pH 7 and hope to keep the MBT out -- or insoluble, so we needed a separate pretreatment system that separated those solids, that separately dewatered the solids, and got them out of the system while still at pH 2.

Then we had to take that 100 to 120 gallon-a-minute stream and bring it back up to at least 8-1/2's before we put it in the biological treatment system so that we could have adequate alkalinity to support nitrification. If you remember, to support nitrification, Noveon has to add the bulk of their alkalinity to support nitrification.

Secondly, Noveon has a wastewater that's almost twice as difficult to transfer oxygen in as a municipal wastewater, so, the aeration horsepower is about twice as big. So, you've got higher energy cost, you've got higher alkalinity cost, you've got the chemical cost of taking a stream from pH 10 to pH 2, back up to pH

8-1/2. You've got the cost of a separate pretreatment facility that's made out of fairly robust materials to operate at pH 2. And you've also got, at the Noveon plant, because of the poor oxygen transfer, if you were to provide complete nitrification, you would have to add additional aeration equipment because, while they do have adequate aeration to support some nitrification, certainly not complete nitrification. So, more aeration equipment would have to be added.

And so -- and when you look at the Noveon-Henry plant, I give them -- I'll say this. They were -- they were wise in only providing the power they needed to the treatment plant. The bad news is any upgrade that's needed has to come from a substation of electrical power that has to be run from a substation about a half a mile away. So, you've got quite an electrical component to that.

Next, the place that they have to build any additional facilities are located where a pond had been, and the fill material put in the pond was great for making sod, but if you were to try to put aeration tanks on it, you would have to dig all that soil out and put soil back that could support the structure of aeration basins, et cetera.

So, candidly, when you lump all that together, you end up with just a much, much more expensive treatment system to provide single-stage nitrification than a municipality has to incur. And the biggest difference not only is in the capital cost but the ongoing operating cost of higher aeration requirements because of the poor oxygen transfer, higher alkalinity addition because of not being able to have enough alkalinity in the raw wastewater and then, three, the whole ongoing chemical cost to take waste streams from 10 to 2 to 8-1/2.

Does that -- does that answer your question?

MS. LIU: Very thoroughly.

THE WITNESS: Thank you. Thank you.

MS. LIU: I understand in all of the treatment alternatives that you've researched and how thoroughly you went through them you understand better than anyone else how much they will cost and what they're capable of achieving as far as reaching compliance, and there seems like there's no perfect solution, no silver bullet, as Mr. Giffin put it.

In the Agency's recommendation they did mention that even if the best degree of treatment didn't achieve full compliance, they would consider supporting the adjusted standard. Looking at the glass as kind of

half full rather than half empty, knowing the cost per pound for removal, knowing the percent efficiency, knowing the reliability of this system, could you in your best engineering judgment make a recommendation to Noveon as to a solution to the problem that might be a compromise?

THE WITNESS: The, the, the difficult part -- the difficult part here is a couple of things, honestly. One is there's a fundamental -- there's a fundamental disagreement about whether 304.122 even applies to Noveon. And therefore, there's a fundamental disagreement about whether any effluent ammonia reduction should even be required of the facility. It is my opinion that 304.122(a) nor (b) apply. And so, candidly, I can't see in the Illinois regulations why effluent ammonia reduction would be required by the regulations. I honestly can't see it in 304.122(a) or (b).

And so any treatment that they would provide would, would -- I don't see why they would since it's not required by the Illinois regulations, in my -- in my opinion. Are there things that could be done to provide some ammonia reduction? That was the whole reason that we went through, and it's part of our exhibit. It's, it's Exhibit 12, where we went through the incremental cost because Noveon, in working with IEPA, everyone wanted to

find some technically feasible, reasonable cost alternative that could be used in reaching an agreement, and we just didn't find one that, that met with agreement.

MR. RAO: Can I follow up on that?

THE WITNESS: Did I answer the question?

MS. LIU: You did.

THE WITNESS: Okay.

MR. RAO: I would just like to follow up on it. You mentioned how you had these discussions with IEPA as to what you were -- I thought you were saying something like what your -- what Noveon was willing to do.

Could you explain it to the Board, what these discussions entailed or in terms of whether you were willing to implement any of these treatment alternatives or --

MR. KISSEL: Mr. Hearing Officer, if I can respond to that, I -- we -- the difficulty we have in responding to that question is not because there's anything that was said there that we wouldn't tell the Board, but the fact is that we -- when the original permit appeal was suspended, it was suspended for the purpose of the Agency and Noveon, then BF Goodrich, discussing and studying various alternatives. We had -- we filed, therefore, a petition for variance with the Board which we

have recently dismissed because these proceedings were going to go forward.

During the course of that period of time, which has been the last 12 years, we have had innumerable meetings with the Agency and a lot of technical papers. You're hearing the summary of it here in the testimony.

The difficulty with going through it is that, at the beginning of every meeting that I attended -- and I think I attended most of them, as did some of the other people in this room -- we said, "These are settlement discussions," and so to allow for the openness and frankness between us, that nothing in those meetings would be brought forward to the -- to anybody else, not just the Board, but, but to preserve the sanctity of settlement discussions.

Now, so I, I think before we would respond to that, I would want to discuss with the Agency whether they would want us to really go into it because in those meetings, do they want us to tell the Board what went on, or the public, for that matter? I can say, without going into detail about what was said, because I wouldn't do that, there -- you have the sum and substance of that 12 years of work before you today.

I don't know if that answers the question or

what the Agency wants to do. Perhaps we can talk about it. But that's the reason that I would say that we really would be remiss in having Mr. Flippin or anybody else in this room testify as to those discussions because they were in terms of trying to settle this whole matter.

MR. RAO: I guess where I was coming from was from the Agency's recommendation when this had -- even if full compliance was not achieved, there are certain things that maybe, you know, the Board could order Noveon to do. And that's one side of the picture we have. I just wanted to get some input from Noveon as to whether there was some, you know, suggestions on Noveon's part that they were willing to do. You know, it's up to you --

MR. KISSEL: Right.

MR. RAO: -- to complete the record.

MR. KISSEL: First of all, let me say that it is my perception and belief that while the Agency is required by law to file a recommendation, that is not evidence in this proceeding. That's merely a guide of what they say. If the Agency wants to come on the stand here, which they are perfectly capable of doing, they have people -- Mr. Pinneo is here, Mr. Mosher is here, Mr. Frevert is not that far away -- and testify what they would accept, we would be more than happy to listen to

them.

So, our position was that -- or is that the technology is economically unreasonable or technically infeasible, as that term is defined in the Board's regulations and statute. Secondly, that even if you required the most stringent of technologies, a later witness will testify what is being done right now; and when the diffuser is installed, there will be -- there will be -- and the Agency agrees -- no impact on water quality. Has not been and will not be. So, is the technology being required as a tax to accomplish something that really accomplishes nothing in the environment? In fact, the effluent will be as, quote, toxic without ammonia as it is with it. That's what the testimony will be. And that's, in a nutshell, BF -- or Goodrich/Noveon's position.

HEARING OFFICER HALLORAN: Ms. Williams, do you want to respond now? I saw you shaking your head.

MS. WILLIAMS: I'm sorry.

HEARING OFFICER HALLORAN: No, now is as good a time as any.

MS. WILLIAMS: No, I wasn't at a lot of those meetings as Dick points out. As he says, the people who were there are -- many of them are still available. I do

have on my witness list Toby Frevert, who's the manager, Division of Water Pollution Control. The primary reason he's on my witness list, is not here today -- I did tell him to save tomorrow if we needed him -- is that if the Board really does want someone with authority to get on the stand and say, "This is what we would accept," he's available to do that. I don't know that there was any -- I mean, you know, I don't want to go back on any commitment not to reveal anything in the course of settlement, obviously, but I don't know that there was ever anything that anybody looked at in that vein in those meetings.

MR. KISSEL: I think that in and of itself, if you believe that, is disclosing what was said at those meetings.

MS. WILLIAMS: I wasn't there so I can't speak for sure.

MR. KISSEL: I don't want to say it, but this is what I say.

MS. WILLIAMS: It would seem like that you would have had to have made an offer in the hope of settlement, right, that you don't want to disclosed. If it was an offer made in the hope of settlement --

HEARING OFFICER HALLORAN: I think we can talk

about this at lunch or off the record, but --

MS. WILLIAMS: But anyway, I guess the only reason I say anything is I would like maybe the Board to let me know this afternoon so I can let Toby know if you feel that's something that you do really need the Agency to respond to, we can have him available.

HEARING OFFICER HALLORAN: Thank you.

MS. RAO: Mr. Kissel, the Board summarized their position well for us, and I just wanted to get something from --

MR. KISSEL: Okay. I was not being -- I'm not trying to be lecturing there, but I did feel it was important to bring this into perspective for the Board.

MR. RAO: Yeah. Thanks.

MS. LIU: Based on the discussion we just had, minus your legal conclusion that 304.122(b) should not apply, would you make a recommendation to Noveon as to which treatment alternative to utilize?

THE WITNESS: I don't know several things that I would need to know. I don't know what target is trying to be hit. And I know that if the question of -- if the question of relevancy to the cost of a POTW is, is one of relevancy, if that is one of relevancy, what I do know is that no matter what alternative we would select, whether

you based it on a 20-year project life or whether you based it on a 10-year project life, the cost for Noveon to remove a pound of ammonia is about 18 to -- is about 12 to 18 times the cost of a municipal wastewater treatment facility. And so you can see why I would hesitate, with that kind of order of magnitude difference, ammonia removal if not required.

MS. LIU: If Mr. Frevert were to come later on and testify as to what a potential target might be, and if you did have to choose, would you be able to do that?

THE WITNESS: If, if he gave us a target, I certainly would be able to go back. And if the Board deemed applicable that target, I would certainly be able to go back, based on the studies we've done, and pick a technology that would be the more appropriate of the ones we studied.

MS. LIU: Thank you. Mr. Hearing Officer, may we retain this witness to recall him after Toby Frevert speaks, if he does?

HEARING OFFICER HALLORAN: Sure, I guess. Mr. -- is it Frevert, the earliest he can be here is tomorrow, correct?

MS. WILLIAMS: I mean, I guess I could call him now. But as far as I know, the earliest would be

tomorrow. I mean, I don't know -- you know, at some point it's the Board's decision, you know. He can speak to our -- come to our -- how our recommendation might have been different, but I guess I wanted some feedback from the Board about how important that was based on -- rather than the Board themselves, you know, being able to weigh the evidence and make that decision, but --

MR. RAO: It's just that, you know, you made some recommendations to the Board, and we wanted to know a little bit more in detail as to what those recommendations mean. It's just that in order to have full information in the record, say they could have -- instead of achieving full compliance, you said to the Board that maybe the Board order them to implement some of these alternatives to, if not full compliance, partial compliance, if I can use that word, which I know -- so, we wanted to know what, you know, it entailed or what target was the Agency thinking of when it made the suggestion.

MS. WILLIAMS: I think --

HEARING OFFICER HALLORAN: I guess there's a couple of ways we can handle it. You need to call Mr. Frevert at lunch.

MS. WILLIAMS: We can do post-hearing --

HEARING OFFICER HALLORAN: Right, right. If

he answers Mr. Rao's question, maybe Mr. Flippin can respond in a reply or we can set a separate briefing schedule. But we could work that out.

MR. RAO: Of course, the Board will make its decision. It's just that our part in this hearing is to get all the information together so that the Board will have as much information as possible in front of it when it makes its decision.

MS. WILLIAMS: Absolutely.

HEARING OFFICER HALLORAN: Any other questions, Mr. Rao? Miss Liu, I'm sorry. I forgot who was up. Tag-teaming.

MR. RAO: I have a clarification question for Mr. Flippin, and this is in Exhibit 13. And let me see what the table number is. On -- let's see -- page one of four, it's a comparison of removals and reliability of effluent ammonia-nitrogen removal processes?

THE WITNESS: Yes.

MR. RAO: You go through all the alternatives, and you have assigned a reliability rating for each alternative?

THE WITNESS: Yes, sir.

MR. RAO: And some of these ratings are, you know, think it goes from the scale of one to ten?

THE WITNESS: Yes, sir.

MR. RAO: And they're close to 10; you know, there are a lot of number of 8's, 7's in there. And I just wanted to get a clarification from you as to when you talk about this reliability rating, are you talking about reliability in terms of treatment in the general, you know, wastewater treatment arena; or if it was implemented at the Noveon plant, would we still have the same kind of reliability rating?

THE WITNESS: Thank you. These reliability ratings were my -- were my professional opinion about how reliable this process would be at reducing effluent ammonia-nitrogen at the Noveon-Henry plant.

MR. RAO: Okay. So, for example, if I pick PC tank stripping with off-gas control which has a reliability rating of 8, if this option was implemented, then you can, you know, on a general sense assume that this treatment option would be capable of removing 27 percent of hydrogen. I think that's what it says, average removal rate is 27 percent?

THE WITNESS: Yes, sir.

MR. RAO: So, is that something that we can make that assumption with this treatment option, that's the removal rate that can be reliably achieved?

THE WITNESS: One way to look at that would be I certainly believe on average it would remove 27 percent. I do believe that.

MR. RAO: Okay.

THE WITNESS: I believe that one way to look at this reliability rating would be in a calendar year, what percent of the time might you not achieve an average removal rate of 27 percent.

MR. RAO: Okay.

THE WITNESS: And something that has a reliability rating of 8 in a calendar year, you may see 20 percent of the days in which it really doesn't get an average removal of 27 percent.

MR. RAO: Okay. Thank you.

MS. LIU: Thank you for explaining everything so clearly. We appreciate that.

THE WITNESS: Glad to. Glad to.

HEARING OFFICER HALLORAN: Thank you. In light of the questions posed, Mr. Kissel, do you have any re-redirect of Mr. Flippin?

MR. KISSEL: None.

HEARING OFFICER HALLORAN: Ms. Williams, re-recross?

MS. WILLIAMS: I will spare Mr. Flippin a

re-recross.

HEARING OFFICER HALLORAN: You know, and I promised the public before we took our lunch that if anybody wanted to come up before lunch and make a comment or statement to do so now. If not, we can revisit that after lunch.

In light of the timing and everything, is it possible for everyone to be back here at, say, 1:35? Grab a bite across the street and get this thing going again?

Thank you and have a great lunch.

(Whereupon, a noon recess was taken.)

HEARING OFFICER HALLORAN: All right. I think we'll go back on the record. It's approximately 1:40. Thank you for being so prompt. I hope you all had time to brush and floss. I doubt it, but we'll proceed.

Mr. Flippin just finished his testimony for now, and Mr. Kissel --

MR. KISSEL: We have our next witness, Mr. Corn.

(Witness sworn.)

MICHAEL R. CORN, P.E.,

called as a witness, after being first duly sworn, was examined and testified upon his oath as follows:

* * * * *

DIRECT EXAMINATION

BY MR. KISSEL:

Q. Would you identify yourself for the record, please?

A. I'm Michael R. Corn.

Q. Mr. Corn, I show you what has been marked as Petitioner's Exhibit Number 16 and ask you to identify that, please?

A. That's the expert written testimony that I prepared for this hearing.

Q. Okay. Did you prepare it yourself?

A. Yes, I did.

Q. And is the statement -- are the statements contained therein true and correct to the best of your knowledge and belief?

A. They are. I would like to make a few corrections.

Q. We'll get to that.

A. Okay.

Q. But other than the corrections you would make --

A. Yes.

Q. -- it's correct?

MR. KISSEL: Okay. I would like to move the

exhibit -- Petitioner's Exhibit 16 into evidence, please.

HEARING OFFICER HALLORAN: Now, is that Number 16 or 17, Mr. Kissel, because we have this one outstanding one here with the responses to the Illinois Pollution Control Board's questions.

MR. KISSEL: We have not marked that as an exhibit yet.

HEARING OFFICER HALLORAN: Okay. I'll just let that -- okay. Number 16, Miss Williams?

MS. WILLIAMS: He stated there were some corrections?

MR. KISSEL: There's just some additions.

MS. WILLIAMS: Additions?

MR. KISSEL: Well, additions or corrections.

MS. WILLIAMS: I mean, I have no objection. I've stated before that I have no objection to the prefiled testimony as it's been submitted, so --

HEARING OFFICER HALLORAN: Okay, terrific. It is so admitted.

BY MR. KISSEL:

Q. Mr. Corn, I show you what has been marked as Petitioner's Exhibit 17 and ask you to identify that, please?

A. This is my resume, specifically on water

quality and related experience.

Q. Did you prepare that document?

A. I did.

Q. Is it true and correct to the best of your knowledge and belief?

A. It is.

MR. KISSEL: I move the admission of Petitioner's Exhibit 17.

MS. WILLIAMS: This is --

MR. KISSEL: His resume.

MS. WILLIAMS: So far as we're going along, we're going with the same stuff that was attached to his testimony?

MR. KISSEL: Yes.

MS. WILLIAMS: Okay. As long as you let me know when we get off that, I'm good.

MR. KISSEL: As far as I know, all of it is, but I'm not sure.

HEARING OFFICER HALLORAN: Okay. Petitioner's Exhibit Number 17 is also admitted into evidence.

BY MR. KISSEL:

Q. And Petitioner's Exhibit 17, Mr. Corn, is that the -- referred to in your testimony on page two as your resume? It says, "My resume is attached." Is that what

you're referring to?

A. That is correct.

Q. Okay. I show you what's been marked as Petitioner's Exhibit 18 in this proceeding and ask you to identify that, please?

A. This is a -- basically a USGS topographic map of the site. The Henry plant sits up on a bluff as cross-hatched here. It's about 80 to 90 feet above the river. POTW is over in this direction. It, again, is up on a bluff. The two discharges come together and are discharged at a point, oh, about 1,000 feet downstream from the Noveon plant. Do you have --

Q. Where did you get that? Where did we find -- you find that exhibit? Did you put it together?

A. Yes, I did.

Q. And from what document?

A. It's the USGS topographic map with the location of the discharge as presented in the NPDES permit.

Q. Does that accurately reflect that which it intends to reflect?

A. Yes, it does.

MR. KISSEL: All right. I move the admission of Petitioner's Exhibit Number 18.

MS. WILLIAMS: No objection.

HEARING OFFICER HALLORAN: Petitioner's Exhibit Number 18 is admitted.

BY MR. KISSEL:

Q. Is that the document you referred to in your testimony as Figure 1?

A. It is.

Q. Show you what's been marked as Petitioner's Exhibit 19. Would you tell us what that is, please?

A. In October of 1989, I directed a study on the Illinois River of the Noveon discharge -- at that time, it was BF Goodrich discharge -- and it shows basically the effluent plumes from the discharge going out into the -- into the Illinois River.

Since that time, I might add, the POTW has been added to the discharge.

Q. Did you prepare that document?

A. I did.

Q. Is that a true and correct, accurate -- and accurate representation of the discharge from the Noveon facility?

A. Yes, it is.

MR. KISSEL: Move the admission of Exhibit Number 19.

THE WITNESS: 19.

MS. WILLIAMS: No objection.

HEARING OFFICER HALLORAN: Exhibit Number 19 is admitted.

BY MR. KISSEL:

Q. Is that exhibit referred to in your testimony as Figure 2?

A. It is.

Q. Show you what's been marked as Exhibit Number 20. Can you tell me what that is, please? I'm sorry.

A. The exhibit is the -- basically the hydraulic characterization of an effluent plume as it goes from a near field, which is the area of rapid and immediate mixing, into a far field, which is basically ambient river diffusion. There are basically well-developed mathematical models for each of these zones.

We have a jet momentum zone which, in many cases, is referred to as a zone of initial dilution. There may be a restratification zone. If the -- if the dispersion is not enough, it may stratify like a heated temperature plume. We have a buoyant spreading zone. The buoyant spreading zone is really a transition zone from the near field into the far field. It's basically gravitational spreading caused by any density differences

between the two plumes, the river and the plume.

And then you have a far field zone which is basically ambient driven dispersion, basically the energy of the river disperses the plume at that point.

Q. Did you prepare that document, or did you get it from someplace?

A. No, I prepared this.

Q. You did. And it's true and correct in reflecting what it purports to reflect?

A. Yes, it is.

MR. KISSEL: I move the admission of Petitioner's Exhibit Number 20.

MS. WILLIAMS: No objection.

HEARING OFFICER HALLORAN: Thank you. Petitioner's Exhibit Number 20 is admitted into evidence.

BY MR. KISSEL:

Q. Mr. Corn, is that referred to in your testimony as Figure 3?

A. Yes, it is.

Q. I will show you what's been marked as Petitioner's Exhibit Number 21. Would you identify that, please?

A. This is a drawing, a schematic that was developed by the National Academy of Sciences back in

1972, and really set the stage for mixing zones from that time forward. And it basically enters in the concept of time and concentration as important to toxicity to aquatic species.

Q. Where did you get that from?

A. This actually came from the Technical Support Document for Water Quality Based Toxic Control. It's a U.S. EPA document. I believe it came out in 1988 and -- but it was not in the current version, the '91 version.

Q. Is that -- is Petitioner's Exhibit 21 a document on which you rely in your business as evaluating discharges in water quality?

A. Yes, it is.

MR. KISSEL: I move the admission of Petitioner's Exhibit Number 21.

MS. WILLIAMS: We are on Figure 4 now?

MR. KISSEL: Yes.

THE WITNESS: Yes.

MS. WILLIAMS: No objection.

HEARING OFFICER HALLORAN: So admitted.

BY MR. KISSEL:

Q. And that is referred to as Figure 4 in your testimony?

A. Yes, sir. Yes, sir.

Q. Show you what's been marked as Petitioner's Exhibit 22. Will you tell us what that is?

A. This is a detailed drawing of the jet momentum zone, and basically it gives a couple of different zones -- a zone of flow establishment, and then basically a concentration profile along the center line of the plume. The zone of flow establishment I speak of in my testimony as something called 50 times the square root of the cross-sectional area, which is one of the things that EPA designates as determining how, how much mixing should occur in a ZID. And it's usually a limiting factor, that basically they say that within that zone of flow establishment you should achieve at least 10 times or 10:1 dispersion. It's not a total limit on the mixing zone; it just says you have to meet 10:1 dispersion within that short zone.

If we were looking at an effluent diffuser, you would not have plume mergers at this point, but later on in the -- at the end of the jet momentum zone, you would still have plume mergers. It would still be an individual plume.

Q. Did you prepare that document?

A. Yes, I did. It came from a U.S. EPA approved document.

Q. It came from the TST?

A. It actually came from a model description of the UDKHDEN model.

Q. And is that a document on which you rely in your profession?

A. Yes, it is.

MR. KISSEL: I move the admission of Petitioner's Exhibit Number 22.

MS. WILLIAMS: I'm sorry. No objection.

HEARING OFFICER HALLORAN: Number 22 is admitted.

BY MR. KISSEL:

Q. I show you what has been marked as Petitioner's Exhibit Number 23. Can you tell us what that is?

A. This is another depiction from one of the other computer models that we rely on, the core mix model. And it basically shows a profile view of the plume as it reaches the surface, the buoyant spreading area, then the ambient dispersion downfield. And the jet momentum zone or the ZID is usually defined in this first part right here.

Q. Did you prepare that document?

A. This came actually out of the core mix

documentation for the model.

Q. Okay. Is that a document on which you rely in your profession?

A. It is.

MR. KISSEL: I move the admission of Exhibit Number 23.

MS. WILLIAMS: No objection.

HEARING OFFICER HALLORAN: Petitioner's Exhibit Number 23 is admitted into evidence.

BY MR. KISSEL:

Q. I didn't ask the last time, but Petitioner's Exhibit 22 is referred to in your testimony as Figure 5?

A. That's correct.

Q. And Petitioner's Exhibit 23 is referred to as Exhibit 6?

A. Correct.

Q. Okay.

A. Figure 6.

Q. Figure 6. I'm sorry. Show you what's been marked as Petitioner's Exhibit Number 24.

A. This is an actual profile of a plume from a diffuser or diffuser port. And typically, the diffuser models depict the end of the ZID as where the edge of the plume reaches the surface, and that's usually where we --

there or a short distance downstream is where we define the zone of initial dilution from a hydraulic standpoint.

Q. Did you prepare that document?

A. Yes, I did.

Q. And is it true and correct in what it intends to depict?

A. Yes, it is.

MR. KISSEL: Move the admission of Petitioner's Exhibit Number 24.

MS. WILLIAMS: No objection.

HEARING OFFICER HALLORAN: Exhibit Number 24 is admitted into evidence.

BY MR. KISSEL:

Q. And that is referred to as Figure 7?

A. Figure 7, correct.

Q. This is a little upside down, but --

A. We've got a big, big poster of this one.

Q. Yes. Show you what's been marked as Petitioner's Exhibit Number 25. Could you tell us what that is, please?

A. This is another depiction of an actual isopleth from our actual study of the plume that we did back in 1989, and it just basically shows the concentration profiles. Maximum concentrations are always

along the center line of the plume which is along the length of the -- of the river.

Q. Did you prepare that document?

A. Yes, I did.

Q. That was based on studies you did for BF Goodrich/Noveon?

A. That's correct.

MR. KISSEL: Move the admission of Petitioner's Exhibit Number 25.

MS. WILLIAMS: No objection.

HEARING OFFICER HALLORAN: Admitted.

BY MR. KISSEL:

Q. And that Petitioner's Exhibit 25 is referred to as Figure 8 in your testimony?

A. That is correct.

Q. Show you what's been marked -- we're almost done -- Petitioner's Exhibit Number 26. Will you please describe that?

A. This is the cross-sectional area of the Illinois River at the discharge point. And in this depiction, we are depicting one of the things in the Illinois regulations and also in the U.S. EPA guidance on mixing zones, is that the mixing zones, including the ZID, are allowed a 25 percent of the cross-sectional area or

volume of flow. And this just gives how much volume of flow the present diffuser is using which, in this case, is, I believe, about 16 percent of the -- of the cross-sectional area.

Q. Did you prepare that document?

A. I did. It's actually prepared from a Corps of Engineers' bathometric profile of the river.

MR. KISSEL: I move the admission of Petitioner's Exhibit Number 26.

MS. WILLIAMS: No objection.

HEARING OFFICER HALLORAN: So admitted.

BY MR. KISSEL:

Q. And that is -- that Petitioner's Exhibit Number 26 is referred to as Figure 9 in your testimony?

A. That is correct.

Q. Show you what's been marked as Petitioner's Exhibit 27.

A. 27 is basically a planning profile view of what the diffuser would look like. We have -- basically were asked to look at a diffuser design, conceptual diffuser design, and this is a multiport diffuser which would give us greater dispersion in a smaller area.

It shows the port at an angle. We would point these ports at a 60-degree angle to make sure, because

it's a denser plume, that we get it up into the water column so the mixing is good. And the diffuser would basically be about 15 feet long with four three-inch ports.

There's a couple different designs we've looked at, but that's sort of the one we're looking at right now.

Q. Did you prepare that document, Mr. Corn?

A. I did.

Q. And is it true and correct to the best of your knowledge and belief?

A. Yes, it is. I may add that the diffuser is a fairly benign object or dispersion mechanism, not very much maintenance on it. Usually send a hardhat diver down to check it once a year to make sure the ports aren't clogged or broken. And usually diffusers last on the order of about 30 years.

MR. KISSEL: Move the admission of Exhibit Number 27.

MS. WILLIAMS: No objection.

HEARING OFFICER HALLORAN: 27 so admitted.

BY MR. KISSEL:

Q. That Exhibit 27 is referred to as Figure 10 in your testimony?

A. That is correct.

Q. Okay. Show you what's been marked as Petitioner's Exhibit Number 28. Can you tell me what that is?

A. That is a model run of a diffuser -- the multiport diffuser, and the projected plume with a ZID, and a total mixing zone, which might range from about 200 feet down to about 750 feet depending on the flow of the river. As flow increases, it tends to elongate that plume because ambient velocity pushes it a little bit further downstream.

HEARING OFFICER HALLORAN: Mr. Kissel, do you have a copy for either myself or, Miss Williams, do you have a copy of it?

MS. WILLIAMS: Actually this one wasn't attached. Sheila did give me some color copies that include this one. So, I do have one in front of me right now.

HEARING OFFICER HALLORAN: Okay. My exhibit --

MS. DEELY: Is it just that one that you want a copy of?

HEARING OFFICER HALLORAN: Well, I just want to make it known that my exhibits stop there as far as

Figure 10.

MR. KISSEL: Okay.

HEARING OFFICER HALLORAN: But in any event, I'm sorry to interrupt, Mr. Corn.

THE WITNESS: Oh, that's okay.

MR. KISSEL: Do you have any objection to that exhibit being introduced, Exhibit 28?

MS. WILLIAMS: I don't think so. Sheila had pointed out to us this morning that she saw there was one that we didn't have, and she gave it to us. So, that's fine.

HEARING OFFICER HALLORAN: Okay. Terrific. Thank you.

MS. DEELY: It was those two?

MR. KISSEL: This is for you.

HEARING OFFICER HALLORAN: Thank you.

BY MR. KISSEL:

Q. That document is referred to as what exhibit in your testimony?

A. As Figure --

Q. Or figure?

A. -- 11.

Q. 11?

A. Uh-huh.

Q. I show you what's been marked as Petitioner's Exhibit Number 29. Could you tell us what that is?

A. This is a report prepared by EA Engineering entitled "Results of an Acute Toxicity Identification Evaluation," TIE, on a filter effluent sample from BF Goodrich.

Q. What is that document? How did you come about having it?

A. This document I used in preparation of my testimony on determining the toxicity of effluent. One of the things we have to look at in mixing zones is to make sure -- we, we make sure that the toxicity is diminished at the end of the ZID and in the mixing zone.

Q. Did you rely on that document in preparing your testimony?

A. Yes, I did.

Q. Who's the author of that testimony?

A. Mr. Goodfellow who, I believe, will be testifying later.

MR. KISSEL: All right. I move the admission of Exhibit Number 29.

MS. WILLIAMS: So you want this entered with Mr. Corn's testimony?

MR. KISSEL: He's referring to it. If you

don't -- if you have an objection, Mr. Goodfellow will verify it.

MS. WILLIAMS: It's not so much an objection. It just seemed logical to us in some ways that Mr. Goodfellow would have gone first, so I'm a little surprised about that.

MR. KISSEL: I don't think we did it alphabetically. I'm not sure how we came about that.

MS. WILLIAMS: That's fine.

HEARING OFFICER HALLORAN: Okay. Number 29 is admitted.

BY MR. KISSEL:

Q. Mr. Corn, you have your testimony before you which is your Exhibit Number 16. Have you reviewed that testimony since it's been submitted to the Board?

A. Yes, sir.

Q. Are there any areas which you'd like to comment on or, or change or modify?

A. A couple -- a couple of additions and --

Q. Okay.

A. -- some things that the Board has asked for that I'd like to point out in my testimony.

Q. Okay. Go ahead.

A. On page two at the end of my qualifications

and experience, I just wanted to note that I've been working on water quality-related projects at Noveon/BF Goodrich since 1989.

Q. Okay.

A. Also on page two, the Board asked a question about what the average concentrations were of ammonia in the effluent in 2003 and for the summer period. And I believe that's in the document we gave you. It was 77 milligrams per liter as an average. We've reported 135 milligrams per liter based on the work that Mr. Flippin has done. But last year, in 2003, the average in the summer was 77, and I think it's 94 for the winter period.

MS. WILLIAMS: Can we -- so this is coming from -- can we please give it a number? Is that too much to ask at this point, if we're reading from the Board's answers?

MR. KISSEL: What he's doing is not necessarily reading from those. What he's doing is he put that together, and he's testifying as to it. I'll be happy to give it a number. You know, we hadn't decided whether we would move its admission or just submit it to the Board, but -- can we get a number to that?

MS. DEELY: If we want, yeah.

MR. KISSEL: Sure.

MS. WILLIAMS: I mean, I think it would be easier for me to be able to refer to it as an exhibit.

BY MR. KISSEL:

Q. Okay. Anything else, Mr. Corn?

A. Yes. On page five when I'm describing the different zones --

Q. What about page -- I thought you said you had something on page three?

A. I must have skipped over that.

Q. Yes.

A. Page three, the background pH in the report says it's 7.7. It's actually 7.77. And the background ammonia concentration should be 0.3 milligrams per liter, and I believe we had -- I thought I put 0.09.

Q. So that -- the background concentration is in paragraph one on page three, and the background ammonia concentration is in paragraph three; is that correct?

A. That's correct.

Q. All right. Above that, it said the water -- the sentence, "The water quality characteristics," my statement says, "U.S. EPA stored data." Should that be Storet?

A. Storet. Thank you.

MS. WILLIAMS: Can you refer me to that line

again?

MR. KISSEL: It's the water quality characteristics, U.S. EPA. It should be Storet database.

MS. WILLIAMS: Thank you.

A. On page -- on page five, I previously described the different zones of a mixing zone, of a hydraulic mixing zone. And under near field zone, I describe that in the fourth sentence down. The sentence reads, "This zone consists of a jet momentum zone, a restratification zone, depending upon plume river density differences after the jet zone, a transition zone, the buoyant spreading zone," which I said was sort of a transition zone between the near field and the far field, and then the -- it should say, "and far field zone, "which is a mixing area where the plume goes from effluent-dominated mixing to mixing totally dominated by the river ambient diffusion, which is a natural energy and dispersive or spreading out forces of the receiving stream.

Q. Okay. Anything else?

A. On page seven, the Illinois regulations specify that you can only use 25 percent of the cross-sectional area or volume of flow to establish the, the mixing in a mixing zone. And that applies to the zone

of initial dilution as well as the total mixing zone.

The intent of the -- all the guidance is to minimize the area you use; and the more mixing you can get in the ZID or the closer to the diffuser, the better you are from impacts to the river. So, I would like to add, after number two --

Q. On page seven?

A. -- on page seven, "The ZID dispersion is limited by 25 percent of the volume of flow or cross-sectional area."

Q. Thank you. Next? Anything else?

A. Just a clarification under -- on page eight under number two, that is describing the -- what we looked at for the Noveon single port diffuser as it exists today. For other discharges that don't meet the 10-foot-per-second port exit velocity criterion, such as for the Noveon discharge, and each of the following A, B and C's describe how we calculated that ZID distance.

Q. What about paragraph 2(b)?

A. 2(b) should be and/or. You use the -- use the smallest distance to establish your ZID.

Q. Okay. Anything else?

HEARING OFFICER HALLORAN: Yes, Miss Williams?

MS. WILLIAMS: I'm lost. I'm sorry. We're

changing on page eight, is that what we're doing here?

MR. KISSEL: Yes, ma'am. Where it says e.g., in paragraph two, Mr. --

MS. WILLIAMS: Oh, that should be and/or?

MR. KISSEL: No, that should be "for the Noveon discharge," right?

THE WITNESS: Correct.

MS. WILLIAMS: Okay. And then --

MR. KISSEL: Paragraph B, just add "slash or" at the end of it.

MS. WILLIAMS: Thank you.

MR. KISSEL: Okay. You're welcome.

BY MR. KISSEL:

Q. Anything else, Mr. Corn?

A. On page ten, the last sentence under multiport diffuser. "And the multiport diffuser will normally meet chronic numeric criteria and chronic co-effluent toxicity within about 100 to 250 feet from the diffuser with a maximum distance on the order of about 750 feet, based on flow."

Q. You're adding the words "with a maximum" --

A. -- "distance on the order of 750 feet."

Q. Okay.

A. And then under number two, it's got -- we talk

about waste. It should be effluent. It's treated effluent.

Q. All right. Anything else?

MS. WILLIAMS: Hang on. Let me catch up. Where does "treated effluent" go?

MR. KISSEL: Pardon?

MS. WILLIAMS: I'm sorry. Where does "treated effluent" go?

MR. KISSEL: Paragraph 6(2), it says, "and the waste is mixed." It should be, "and the treated effluent is mixed primarily by ambient turbulence."

MS. WILLIAMS: Okay.

BY MR. KISSEL:

Q. Anything else, Mr. Corn?

A. On page eleven, we have at -- right before water quality effects, IEPA allows a total of 26 acres for the total mixing zone and the 16 acres, and that last sentence should be 26 acres.

Q. Anything further?

A. The -- a little bit of clarification on the two ammonias. NH4 which is the ionized form of ammonia is not considered toxic. The un-ionized form, NH3, which Mr. Flippin talked about being able to strip from because it turns into a gas, is a toxic form, which shows up in

aquatic toxicity tests.

Q. So, your addition is to add the word --

A. Under -- after NH4 which is not considered toxic.

Q. So the word "considered" is added. Okay.

MS. WILLIAMS: Oh, I'm sorry, I lost -- I'm lost again. I followed the words he was saying; I just don't understand exactly where -- I lost the line.

MR. KISSEL: I'm sorry. Oh, sure.

MS. WILLIAMS: Where does it say --

MR. KISSEL: It's on page eleven, ammonia or NH3, the last paragraph.

MS. WILLIAMS: Right.

MR. KISSEL: The sentence reads, "Ammonia exists in the environment both as" --

MS. WILLIAMS: There it is.

MR. KISSEL: Yes. Okay.

MS. WILLIAMS: Thank you.

MR. KISSEL: You're welcome.

BY MR. KISSEL:

Q. Anything else, Mr. Corn?

A. On page 12, and we're talking about dissolved oxygen. Just a clarification. The river meets DO standards. It's the next-to-last sentence in that

paragraph under dissolved oxygen. "The river meets DO standards based on the available data for downstream locations that would potentially be affected by the Noveon discharge." It's just to make sure that we're talking solely about the Noveon discharge at this point.

Q. Okay. Anything else?

A. I believe I've already -- on page 13 under ammonia water quality standards, we're talking about a distance of 100 to 250 feet from the diffuser, and I've clarified that that would normally be the distance to meet the total mixing zone or chronic zone for ammonia.

Q. Anything else, Mr. Corn?

A. That is it.

Q. Okay. I call your attention to page three of your testimony, the last sentence on the page that reads, "Data for the winter indicate that these months are not limiting periods for ammonia discharges." When you use the term "limiting periods," what do you mean?

A. When we look at discharges, we try to find out what is the most critical period that we have to design for as far as the diffuser would go. And the summer conditions of low flow, high temperatures gives us the most critical periods to design for, both from a water quality standpoint and toxicity standpoint.

Q. Water quality standards for ammonia are divided into two times of the year; is that correct?

A. Summer and winter.

Q. Okay. And what is generally the summer, and what is generally the winter, or what is -- do you know what they are in Illinois regulations?

A. What the two different standards are?

Q. No, what, what the months are? Do you know what the --

A. Oh, the months for summer are April through October, and then November through March for winter.

Q. All right. And for each of those periods, there are -- what standards exist? What kinds of standards?

A. There's whole effluent toxicity standards, but there's also specific ammonia acute standards, which is a number that would be derived from pH data, and then there is a specific chronic ammonia standard that you would have to meet.

Q. So, Illinois has summer and winter standards; and summer, there's summer acute, summer chronic, winter acute and winter chronic. Is that correct?

A. Correct.

Q. And in this instance of the Noveon discharge,

what is the standard that you -- is most limiting, if you will, as you defined that in your testimony?

A. The one that we've always been limited in is the acute standard which is at the edge of the ZID limits, the -- what dispersion we have to meet --

Q. And what, what time of the year?

A. -- to meet the standards. During the summer, and September being the critical period because that's the lowest flow period for the Illinois River.

MR. KISSEL: That's all I have.

HEARING OFFICER HALLORAN: Thank you. Miss Deely, do you have copies of Mr. Corn's written testimony for the members of the public?

MS. DEELY: Yes, I think I passed them out.

HEARING OFFICER HALLORAN: Anybody else want a copy of Mr. Corn's written testimony?

AUDIENCE MEMBER: How can we arrange for exhibits of that as well?

HEARING OFFICER HALLORAN: Well, you can go on our website, and I believe they scan them, or you can come in personally to the Chicago office, or you can call the clerk, and I think he can take care of you there. And I will give you -- next break I'll give you our website, and I will make it for the record at the conclusion.

With that said, Miss Williams, is your cross, do you know -- your crystal ball -- going to be long? The reason I'm asking, Mr. Melas, Member Melas, has to take a flight back to Chicago for a Board meeting, and he's got to leave about three. And I was remiss in -- I stated earlier, but I wanted to see if any members of the public wanted to make public comments, statement while Member Melas is here and before he takes off to Chicago. And that's not to say you can't make it later if you don't make it now, but --

MS. WILLIAMS: I think it would be appropriate to break off now. I would probably actually like to take a couple minutes to make a call back to the office, and if we want to allow for public testimony during that period?

HEARING OFFICER HALLORAN: You don't want to be here?

Does anybody want to make a public comment, statement at this time? I don't see any hands.

Do you need to take a minute break?

MS. WILLIAMS: Just two or three minutes, yeah.

HEARING OFFICER HALLORAN: Okay. We're off the record. Thanks.

(Whereupon, a recess was taken.)

HEARING OFFICER HALLORAN: We're back on the record, and I think Mr. Kissel has finished his direct, and it's Miss Williams' turn.

CROSS-EXAMINATION

BY MS. WILLIAMS:

Q. Good afternoon, Mr. Corn. How are you today?

A. Very good.

Q. Just like to ask you a few questions about your testimony today. On page one, you talk about your participation in the adoption of the Board's mixing zone rules; is that correct?

A. Correct.

Q. And you testified in those hearings?

A. I did.

Q. And who were you representing when you testified in those hearings?

A. The Village of Sauget, S-a-u-g-e-t.

Q. Not Song Jay is what came through yesterday. Were you here for that part? No?

A. I was here.

Q. And on page two of your testimony, in number three, description of effluent and river, but then there's another number three under that, do you see that? It starts with, "The Henry facility."

MR. KISSEL: Subparagraph three.

BY MS. WILLIAMS:

Q. Subparagraph three, I guess you'd call it, one through four?

A. Yes.

Q. In that paragraph, it said, "Ammonia measurements made by IEPA and Noveon or their contractors indicate that ammonia concentrations in the effluent average around 900 pounds per day or 135 milligrams per liter." Is there a specific place that you looked to to come up with those figures?

A. The number of 135 milligrams per liter, I consulted with Mr. Flippin, and he gave me that number. I've also looked back through numbers available from IEPA and the people that have done the work.

Q. When you say "numbers available from IEPA," could you --

A. They have collected samples for ammonia analysis over the years.

Q. So, the annual discharge monitoring?

A. Whatever they've monitored.

Q. Okay.

A. I believe all the samples have been grabs, but I'm not sure.

Q. And on page three of your testimony, too, I just wanted to clarify, you made a change -- and I'm not sure if I heard you correctly -- background ammonia concentration in the river, and it said 0.09. You changed that to 0.3?

A. 0.3.

Q. And was that a typo, or is that based on newer information?

A. No, that's a typo. Sometimes my 3's look like 9's.

Q. But you also put in an extra zero then, too?

A. I didn't, but --

Q. Okay.

A. But that is .3 based on the --

Q. You don't do your own typing, Mr. Corn?

A. Sometimes I do.

Q. I do my own typing.

A. Most of the typing I do.

Q. And on page six, you state under the subtitle Actual Mixing Zone, you say, "The existing single port diffuser is effective in dispersing the effluent into the Illinois River, and the effluent has been and will continue to meet water quality and whole effluent toxicity limits in this mixing zone."

A. Correct.

Q. Now, are you talking about the acute and chronic standards?

A. Acute and chronic.

Q. And are you talking about a regulatory mixing zone here, or are you talking about something different than that?

A. The mixing zone as we monitored and reported to IEPA.

Q. I guess maybe I need you to explain that for me a little bit more.

A. The, the mixing zone as we measured, using conductivity, basically went out to about 100 feet, and we achieved a dispersion on the order of about 20:1 at that point, and we will meet acute toxicity and numeric criteria in the mixing zone for that mixing zone as, as described.

Q. Now, when you say you measured, you don't mean that you went out and took samples of the water quality in the river?

A. We went out and we collected or measured conductivity and used it as a surrogate to look at dispersion in the river.

Q. But you didn't actually measure to confirm

whether your models were correct what the actual mixing zone is?

A. We confirmed that with the conductivity. It is a tracer that can be used to measure the dispersion.

MS. WILLIAMS: I'm not sure if he answered my question.

BY MS. WILLIAMS:

Q. You did -- I mean, you didn't actually take samples to make sure, at the edge of the mixing zone, the water quality standard was being met?

A. The water quality standard for?

Q. The mixing zone would be chronic, I guess, or at what your ZID would be that the acute was being met?

A. For?

Q. Ammonia.

A. Ammonia? No, we did not take ammonia samples.

Q. Thank you. That's all I was trying to get at. And you state here in that same paragraph, "The dispersion achieved at the downstream edge of the plume at about 1,000 feet downstream is 100:1 or more"?

A. Correct.

Q. 1,000 feet; that's about the length of, what, three football fields? Is that pretty close?

A. Correct.

Q. Are you aware of any other mixing zones in Illinois that are this long?

A. I believe there is one that I know of that's that long, and I believe the Village of Sauget has one that's that long or longer.

Q. And where does the Village of Sauget discharge to?

A. Mississippi River.

Q. Are you aware of any others?

A. The Olin diffuser at Alton, East Alton, we requested 1,000 feet; I have not seen what the final number they got. The 3M diffuser, we requested 1,000 feet as well. That's in Cordova, Illinois.

Q. Are you aware that the Board's water quality standards for ammonia were amended recently?

A. Yes, I am.

Q. Can you tell us when they were amended?

A. I believe that was in the 2001-2002 time period.

Q. Do you know if that changed the winter and summer time periods at all?

A. Not that I know of.

Q. Are you familiar with the term that was used in that rule-making, the subchronic water quality

standard?

A. No, I have not looked at that.

Q. So, you haven't looked at whether Noveon is meeting that standard?

A. I have not looked at that.

Q. On -- I'm looking at page eight now of your testimony. And down towards the second paragraph from the bottom, the second sentence here, "Both Noveon and Henry keep POTW discharging through the single port diffuser and, using background, temperature, pH and total ammonia values from upstream monitoring stations, total ammonia concentration of 155 milligrams per liter could be discharged from a single port diffuser and meet water quality standards at the edge of the downstream edge of the ZID."

That's your testimony, the effluent standard that's required in the summer months --

A. Correct.

Q. -- to meet the -- to meet the acute water quality standard?

A. The acute, correct.

Q. And that's as it stands currently with the single port diffuser?

A. That is correct.

Q. And with the multiport diffuser, you're saying they could go up to 220 milligrams per liter?

A. Well, the dispersion for the multiple diffuser that we have, have the conceptual design for would meet a dispersion of 43:1, and that's much greater than 200 milligrams per liter.

Q. So, it would be your testimony that with the multiport diffuser they'd actually be able to increase their discharges of ammonia and comply with the water quality standards still?

A. I think it would give them a much greater safety factor.

Q. Now, can you -- I'm not sure that you really exactly explained for us how you used Mr. Goodfellow's data in your calculations. Could you maybe explain that to me a little bit? I'm not real familiar with his stuff yet.

A. Mr. Goodfellow -- and he will testify on this, but basically, he identified two constituents in the Noveon effluent that causes toxicity in whole effluent toxicity tests. One of those constituents was ammonia, and one was salt or total dissolved solids. Based on his work and based on work that I've done in the past, the salt alone will cause -- will require dispersion of on the

order of 6 to 9 to 1 to meet just the salt toxicity.

So, I relied on that work to make sure that when we design a multiport diffuser that we design it to meet all the whole effluent toxicity acute standards and the chronic as well. Obviously, 43:1 is much greater than we would need to meet that toxicity from the salt.

Q. But 43:1 is based on what?

A. The multiport diffuser.

Q. I'm sorry, I take that back. What do you believe you need to address ammonia then? What is that based on?

A. That is based on the multiport diffuser for the future. There have been a couple of readings that I have seen that are grab samples that are in the 200 milligram per liter range; and to ensure that we can meet whole effluent toxicity for that, from an acute standpoint, the multiport diffuser would be the assurance that we would need for that.

Q. Just a second. What I'm trying to understand, Mr. Corn, is this: It appears to me from looking at Mr. Goodfellow's work that he doesn't know exactly how toxic Noveon's effluent limit goes because even at the most diluted ratio of 6.25 percent, toxicity was discovered, correct?

A. You'll have to ask Mr. Goodfellow about that.

Q. Well, I'm trying to decide -- that's why I was hoping he would go first because I have questions about how he got his numbers. So, I guess to the extent there are questions about his numbers, do they call into question any of your findings with regard to the mixing zone?

A. I don't believe so.

Q. So, it's not necessary for determining the mixing zone to know how chronic and toxic Noveon's effluent is?

A. The chronic toxicity? Yes, it is.

Q. It is necessary? And what figure did you use for that?

A. I used 100:1.

Q. And where did you -- how did you choose that?

A. That was based on the 155, 155 milligrams per liter.

MS. WILLIAMS: Well, Mr. Hearing Officer, my technical advisor is asking me if he has permission to ask a follow-up question of the witness. It's up to you whether you're willing to break that kind of protocol.

HEARING OFFICER HALLORAN: Mr. Kissel?

MR. KISSEL: I think we're sort of doing this

through lawyers right now. If Mr. Mosher wants to do a public comment --

HEARING OFFICER HALLORAN: I agree. Let's try to keep it to the attorneys because that could open a whole floodgate.

MS. WILLIAMS: I warned him, but I told him I'd ask.

HEARING OFFICER HALLORAN: Thank you.

BY MS. WILLIAMS:

Q. Now, what -- can you repeat for us what the dimension is of the ZID that you calculated?

A. The ZID is less than five -- the ZID?

Q. Yes.

A. For which, which diffuser?

Q. Start with the single port.

A. The single port diffuser would be about 66 feet long, and I think at that point it may be 30, 50 feet wide, something like that. Maybe a little bit wider.

Q. How long does it take to travel that distance through the Illinois River?

A. Well, if you look at just the velocity in the river, it's less than a few minutes.

Q. And is less than a few minutes -- I mean, I would say less than a few minutes definitely means more

than a minute, right?

A. Less than a few minutes is three minutes or less.

Q. About three minutes? Is about three minutes what you mean when you say rapid and immediate mixing?

A. Yes.

Q. Remember that when it takes me three minutes to look through whether I have any more questions.

Okay. A couple places in your testimony you refer to the 1990 -- 1972 National Academy of Sciences' theory of -- regarding limiting exposure time for aquatic life?

A. Correct.

Q. Isn't it true that the Illinois EPA explicitly rejected this concept in its guidance?

A. And I so state in my testimony.

Q. Are you aware of whether that guidance has been approved by U.S. EPA?

A. The EPA, the --

Q. Whether the Illinois EPA guidance has been approved by U.S. EPA?

A. I don't know.

Q. Are you aware of whether the Illinois EPA water quality regulations still rely on un-ionized ammonia

for measuring?

A. That was my assumption when I've done most of this work since 1989.

Q. You know that U.S. EPA has gone to looking at total ammonia again, though, correct?

A. I have heard that.

Q. Can you tell us whether you feel aquatic life will be impaired inside the regulatory mixing zone you proposed?

A. I don't believe so.

Q. And what do you base that on?

A. Basically, the velocity of these discharges, basically the sweep are rapid enough to move aquatic life away from the maximum concentrations.

Q. So, what you're saying is aquatic life are unable to even live in the mixing zone based on that?

A. In the zone of initial dilution, the ZID area.

Q. What about in the mixing zone?

A. In the mixing zone, they may pass through that. They could -- they could potentially live there.

Q. What would be the impact on mussels or clams in the bottom of the river?

A. I have no data to base that on.

Q. Now, you state that -- I believe on page seven

that Noveon has asked for less than five acres for its total mixing zone; is that what -- that's what we're using TMZ here for, right? Less than five acres?

A. That is correct.

Q. Are you aware of any other mixing zones in Illinois that are equal to or greater than five acres?

A. I would assume the ones that I've mentioned in that area would be that distance, be that size area.

Q. And do you think the mixing zone regulations as adopted by the Board intended for an area of five acres without clams or mussels to exist in them?

A. The -- as I understand it, the 26 acres is for the total mixing zone, and that's -- includes the ZID and the total mixing zone, and I would assume that they considered that.

Q. And so you think it means that within that maximum of 26 acres, it's okay for there not to be a condition to support mussels or fingernail clams or that type of bottom life?

A. I think that what they've said is that they will allow 26 acres for the total mixing zone.

MS. WILLIAMS: I think that's all I have. Can I just confer for one second?

HEARING OFFICER HALLORAN: Sure.

(A pause was had in the record.)

MS. WILLIAMS: Okay. I think I'm done. Thank you.

HEARING OFFICER HALLORAN: Thank you. Mr. Kissel, before your redirect, I want to ask Member Melas if he had any questions before you took off for your scheduled flight?

MEMBER MELAS: None, Mr. Court.

HEARING OFFICER HALLORAN: Okay. Thank you. Mr. Kissel, you may proceed.

REDIRECT EXAMINATION

BY MR. KISSEL:

Q. Mr. Corn, there was some discussion on -- using conductivity here?

A. Yes.

Q. And what, what is conductivity just for purposes of our discussion here?

A. Conductivity is a way to measure salt content or the concentration in the plume area.

Q. All right. Is it also called salinity?

A. Salinity is another name for conductivity.

Q. And is salinity used as a tracking chemical?

A. Yes, it is. It's a conservative constituent. And whatever happens to the salt or salinity, any other

constituent would undergo those same dispersive forces.

Q. So, if there's another contaminant in the discharge and you track the salt, that contaminant will act identically to the salt in the hydraulic atmosphere; is that correct?

A. That's correct. If you have a 13:1 dispersion of salt, you would have a 13:1 dispersion of the ammonia or any other constituent.

Q. There was some discussion by Miss Williams about this setting the dilutions and so forth. Is what you're attempting to do is to really set a water quality-based effluent limit? Is that basically what you're doing?

A. That's correct.

Q. And how do you do that?

A. You basically take the dispersion at the edge of the ZID and translate that back to the end of pipe.

Q. By using -- meeting what standard at the end of the ZID?

A. The water quality standard.

Q. For?

A. For salt or ammonia.

Q. Would that be the acute standard at the end of the ZID?

A. At the end of the ZID, it would be the acute standard. At the end of the total mixing zone, it would be the chronic standard.

Q. So, take us through with a 43:1 in terms of the -- of the acute standard at the end of the ZID, you determined that there was a dilution of 43:1 based upon your studies; is that correct?

A. Correct.

Q. Which means at the end of the zone of initial dilution where that 43:1 dilution exists, then you -- how do you translate that back to a water quality-based effluent?

A. You would take the water quality -- the acute -- the acute ammonia water quality standard and multiply that by basically 43, and then that would be your end-of-pipe discharge.

Q. Also some question -- a question about the time between the discharge and the end of the ZID, and I think you said it was three minutes. And my understanding of what you said, correct me if I'm wrong, was that was based on the flow of the river?

A. Well, it's actually based on both, the flow of the river and on the port exit velocity.

Q. So, it would be a --

A. Obviously at 10 feet per second from a multiport diffuser, it would be a lot less than three minutes.

Q. All right. At the multiport diffuser, what would you, ballpark, say the time from the discharge to the end of the ZID would be?

A. A few seconds.

MR. KISSEL: That's all.

HEARING OFFICER HALLORAN: Thank you. Miss Williams, recross?

RECROSS-EXAMINATION

BY MS. WILLIAMS:

Q. Are you familiar with regulations 35 Illinois Administrative Code Part 355, Determination of Ammonia Based Water Quality Effluent Limits?

A. I'm sure I've read them, but --

Q. Well, I'm not sure that you have. I mean, that's why I'm asking. They were recently amended in July, I think, of -- maybe actually in October of this year -- of last year, I mean.

A. Yeah, I'm not sure that I've read those.

Q. Okay. Those are the Agency -- I'll describe them for you if it would help. They are the Agency regulations we use to determine water quality-based

effluent limits. Have you ever seen those or read those?

A. I don't believe.

Q. For ammonia specifically? I'm sorry.

A. For ammonia. I don't recall.

MS. WILLIAMS: I think that's all I have.

HEARING OFFICER HALLORAN: Thank you.

MR. KISSEL: I have nothing else.

HEARING OFFICER HALLORAN: Thank you. Technical Unit, any questions of Mr. Corn?

MS. LIU: Good afternoon, Mr. Corn. Would you happen to know how much it might cost Noveon to install the multiport diffuser and to maintain it?

THE WITNESS: Noveon had an engineering firm, Horner and Schiffrin, they're out of Belleville, Illinois, and St. Louis, Missouri, an engineer named Tom Thompson came up with a cost, and I think we've put that in the unit response. But it was $666,000 a few years ago, and we used a 3 percent inflation rate and brought that up to today's dollars of $800,000.

MS. LIU: Thank you.

MEMBER MELAS: I had one question.

HEARING OFFICER HALLORAN: Yes, Member Melas?

MEMBER MELAS: One part I read that the single port diffuser that's used now is jointly used by the

Noveon discharge and the Henry POTW?

THE WITNESS: That is correct.

MEMBER MELAS: And do they share the cost, or how do they operate that? Do you have any idea?

THE WITNESS: The -- it's my understanding that Noveon made the diffuser available for the City. We met with IEPA and that was approved.

MEMBER MELAS: Okay. Makes sense.

MR. KISSEL: Maybe we should be charging them. No.

MEMBER MELAS: No. You're good citizens.

MR. KISSEL: That is right. Excuse me. We are.

I'm going to mark this as an exhibit. I've asked the hearing officer -- or I marked as Exhibit Number 30 the documents that we gave to the Pollution Control Board so we can now refer to that.

MS. WILLIAMS: Thank you.

HEARING OFFICER HALLORAN: Any --

MR. KISSEL: I just have a couple more.

FURTHER REDIRECT EXAMINATION

BY MR. KISSEL:

Q. Following up on that question of the technical advisor to the Board, Mr. Corn, what about -- what would

be the construction schedule for the installation of a diffuser?

A. We have estimated a -- about a one-year construction schedule. We do have a conceptual design. We think we can do the detailed engineering in three months. We have put in three months for regulatory approval. That would be IEPA, as well as the Corps of Engineers. You have to get a Corps of Engineers permit.

And then the optimum time for building a diffuser is obviously during the summertime, during low flows. Then we would need a one- to two-month period to knock any cobwebs out of the system. So, basically about a year to get the diffuser up and running.

Q. Is there any maintenance cost involved?

A. Maintenance costs are pretty minimal. Hardhat diver once a year, and then if you have electric -- electrical lights or anything at your river control structure for the diffuser. You're not talking -- a couple hundred, maybe a thousand dollars a month or, or less.

MR. KISSEL: Thank you. That's all I have.

HEARING OFFICER HALLORAN: Any follow-up, Miss Williams?

* * * * *

FURTHER CROSS-EXAMINATION

BY MS. WILLIAMS:

Q. Just one question about what you just brought up there. When you said IEPA approval, can you explain?

A. We met with --

Q. I'm sorry. When you -- you talked about the requirement to get IEPA approval as part of your construction schedule?

A. Correct.

Q. Do you know -- because my technical staff was explaining to me yesterday, I think, that you don't need a permit for that, an actual construction permit. So, is there some other type of permit?

A. The Corps of Engineers requires -- I believe the Corps of Engineers requires IEPA to okay the addition of the diffuser under a 404 permit.

Q. Okay. That's probably what we call a 401 certification; does that sound right?

A. I think that's it. The water quality certification under that, I believe.

Q. Thank you.

A. We've gotten that before on other diffusers.

MS. WILLIAMS: That's all I have.

HEARING OFFICER HALLORAN: Okay.

MR. KISSEL: Thank you, Mr. Corn.

HEARING OFFICER HALLORAN: Thank you, Mr. Michael R. Corn. You can step down.

Petitioner's Exhibit Number 30, any objection for moving this into evidence, Miss Williams? It's the responses to the Board's questions.

MS. WILLIAMS: No.

HEARING OFFICER HALLORAN: So admitted.

MR. KISSEL: Thank you.

(A pause was had in the record.)

MR. KISSEL: Would you identify yourself for the record, please?

HEARING OFFICER HALLORAN: I'm sorry. Please raise your right hand, and Jennifer will swear you in.

(Witness sworn.)

WILLIAM L. GOODFELLOW, JR.,

called as a witness, after being first duly sworn, was examined and testified upon his oath as follows:

DIRECT EXAMINATION

BY MR. KISSEL:

Q. Would you identify yourself for the record, please?

A. Yes. My name is William L. Goodfellow, Jr.

Q. And where do you live, Mr. Goodfellow?

A. I live in York, Pennsylvania.

Q. I show you what has been marked as Petitioner's Exhibit 31 and ask you to tell me what that is?

A. It is my written testimony for this proceeding.

Q. Did you prepare that?

A. I did.

Q. And is it true and correct to the best of your knowledge and belief?

A. Yes, it is.

MR. KISSEL: I move the admission of Exhibit -- Petitioner's Exhibit 31.

MS. WILLIAMS: No objection. Does that include --

MR. KISSEL: No, I'm going to add --

MS. WILLIAMS: -- the resume?

MR. KISSEL: It does include it.

BY MR. KISSEL:

Q. But would you identify -- tell me what Petitioner's Exhibit 32 is, please?

A. Yes. It is my resume.

Q. And --

A. Minus the header page that's on the -- on the

other document.

Q. But is that a true and correct recitation of your experiences, education, et cetera?

A. Yes, it is.

MR. KISSEL: All right. Move the admission of Petitioner's Exhibit Number 32, I believe.

THE WITNESS: Yes.

MS. WILLIAMS: No objection.

MR. KISSEL: For the record, Exhibit 31 does have this attached, but I thought we would have it separately.

MS. WILLIAMS: What page does it start on? Can you -- Exhibit 32 starts on page --

MR. KISSEL: Well, his, his testimony runs ten pages.

THE WITNESS: Page eleven.

MS. WILLIAMS: So, page eleven.

MR. KISSEL: For the record, Mr. Hearing Officer, all the testimony we've entered will be entered into the record as so read, correct?

HEARING OFFICER HALLORAN: That's correct.

MR. KISSEL: Including Goodfellow and Flippin and Corn.

HEARING OFFICER HALLORAN: So, Exhibit Number

31 and 32 are admitted into evidence without objection?

MS. WILLIAMS: (Counsel nods head.)

HEARING OFFICER HALLORAN: And also, Miss Deely, do we have copies of --

MS. DEELY: I just handed them out.

HEARING OFFICER HALLORAN: You're way ahead of me. Thank you. You may proceed.

MR. KISSEL: I don't have any specific questions. He's familiar with cross-examination.

HEARING OFFICER HALLORAN: Okay. When you get your bearings, Miss Williams, you can --

MS. WILLIAMS: Shouldn't take too long.

CROSS-EXAMINATION

BY MS. WILLIAMS:

Q. Can we start, I guess, maybe give -- have a good transition here. Mr. Corn just testified that he made use of your tests that you performed --

A. Yes.

Q. -- for Noveon, and I'm aware of two separate tests that were performed, correct, from your testimony?

A. Correct. Two rounds of testing.

Q. Two rounds. Can we call them the March '99 and the May '99 or --

A. I think it was January and March.

Q. I'm going off the -- the one that was entered as Exhibit 29 has March on the front of it. Is that the first or the second?

A. That would be the January testing.

Q. Okay. Would you mind if we called it March --

A. That's fine.

Q. -- since --

A. I think on the -- when the sample was collected, but that's fine.

Q. We can call it the first round -- I guess we'll call it the first round and second round.

A. That would be fine.

Q. By first round we're referring to Exhibit 29.

A. That's fine.

Q. Can you explain for us how you communicate -- what you communicated to Mr. Corn to give him the information he needed to perform his mixing zone --

A. Sure.

Q. -- evaluation?

A. I provided him the written documentation, as well as we had one meeting at Illinois EPA to discuss the findings of the results, but it was --

Q. So, you provided him the summary here or data as well or --

A. It was the written report, yes.
Q. So, the same as what we had here as --
A. Uh-huh.
Q. He relied on Exhibit 29?
A. Correct.
Q. Did you also provide him the second round of tests, or did he rely purely on the first round?
A. I am not sure. I provided it to Gardner, Carton & Douglas, and then from there I don't know what happened to it.
Q. So, you didn't directly communicate with Mr. Corn in order to explain to him your results or anything; he just relied on writing -- your written report?
MR. KISSEL: I think he testified he had a meeting with him in Springfield.
BY MS. WILLIAMS:
Q. At the IEPA?
A. Uh-huh.
MR. KISSEL: Yeah.
BY MS. WILLIAMS:
Q. I would like to talk about pages four and five of your testimony.
A. Okay.

Q. And here you're discussing the results of the first round of testing, correct?

A. Correct.

Q. And can you -- I guess since Counsel didn't really have anything to ask you, I guess I'd appreciate it if you summarized real briefly for us what those first round of tests concluded?

A. Sure. We were asked to evaluate the effluent, given the test species that were being used by the Agency which were the water flea -- Ceriodaphnia dubia -- and the fathead minnow, which is Pimephales promelas. And we selected the chronic toxicity test as well as the acute toxicity test.

However, at that time -- and I have yet to see any additional data -- only acute toxicity testing was performed. We selected chronic toxicity testing to also be one of the parameters to evaluate because it uses three samples within a short period of time so we could determine if there was any kind of temporal variability of effluent toxicity. And then we were going into it with the -- proceeding to if it was toxic, to evaluate using toxicity identification evaluation procedures. And we did that on the most toxic sample of, of the --

Q. You abbreviate that TIE?

A. Yeah, toxicity identification evaluation is also referred to as the acronym TIE. The -- I'm sorry.

Q. You state on -- you state on page four that the objective was to determine the no observed effect concentration, the lowest observed effect concentration, which are abbreviated NOEC and LOEC respectively?

A. Correct.

Q. And the chronic value?

A. Correct. As well as the acute end point.

Q. Then on page five you state, "The chronic toxicity suite of samples were also chronically toxic with the NOEC of less than 6.25 percent effluent and LOEC of 6.25 percent effluent for both species"?

A. Correct.

Q. So, can you tell us, Mr. Goodfellow, what is the no observed effect concentration for Noveon's effluent?

A. It was less than 6.25.

Q. Do you know how much less than 6.25?

A. It was --

Q. Did you test anything less -- more diluted than 6.25?

A. No, because the objective of the tests we were performing was just to find the most toxic sample to then

further take it through the acute TIE procedures.

Q. But you said on page four that part of the objective was to determine the no effect?

A. Yes, and we determined that it was less than --

Q. That it was less than 6.25?

A. Less than 6.25 percent, which is a valid toxicological end point.

Q. Well, I don't disagree with that. I guess I just want to understand why then, when you went through the samples collected in March --

A. Uh-huh.

Q. -- you had the same results, correct, less than 6.25?

A. Correct.

Q. And this was true even though the ammonia concentrations were lower in the second round of samples, correct?

A. Correct. However, the salinity was higher.

Q. Wouldn't it have made sense in the second round of testing to go below 6.25 to get something lower?

A. Again, the objective of the test was to determine -- to try to pick the most toxic of the three samples within a chronic test to run an acute TIE

procedure.

Q. So, Mr. Corn couldn't have used your data then to make his estimates, could he?

A. Yes, he could. Less than 6.25 is a valid toxicological end point.

Q. So, he just used less than 6.25; not a specific number, just that it was less than 6.25?

A. I -- you would have to ask him.

Q. Okay. Well, let's, let's talk about the fractionation test, all right? That's what you're saying was the primary goal, to go through that?

A. Correct.

Q. That was your primary goal. And you state in your testimony, don't you, that none of those tests were successful in removing toxicity?

A. Not completely, correct.

Q. So, how can you conclude what's causing the toxicity?

A. That's a good question. The fractionation procedure, which is also synonymous to the TIE, is a series of physical and chemical procedures that is meant to evaluate various fractions of the effluent, to thus track and determine the characteristics of the wastewater.

Information, when you fractionate a sample,

you will both be -- you will gain information from removing toxicity as well as not removing toxicity. We were looking for activities to determine if there was any organic toxicity, any ammonia toxicity, any metal toxicity, any oxidant toxicity, as well as reducible compounds.

Virtually the only parameter that stays after doing all those treatments is salinity, and salinity is, is the treatment that doesn't get altered. In fact, many of the other treatments actually add toxicity because they're actually increasing the, the total dissolved solids in the wastewater that you're evaluating.

Q. How are you able to conclude that there was no organic toxicity?

A. By using the C-18 column. The C-18 column is a solid phase extraction column that is selective for pulling out non-polar organic compounds that are less than 2,000 molecular weight. C-18 columns are chosen over some of the other columns because when a molecule is over 2,000 in its molecular weight, it can't pass the membranes of a cell. So, it's -- they're really not toxic.

MR. KISSEL: For purposes of the record, there's also a C-18 treatment facility. These are unrelated.

THE WITNESS: Yeah, just coincidentally.

MR. KISSEL: We didn't use the plant to determine that, the C-18 column.

HEARING OFFICER HALLORAN: Thank you.

BY MS. WILLIAMS:

Q. When you talk about non-polar organic compounds and amine contributing organic compounds, can you explain to us --

A. Sure. The reason I said that one of the principal toxicants in the testimony was un-ionized ammonia and/or amine contributing organic compounds, primary amines as well as secondary and tertiary amines often, as part of the degradation process, get pushed toward ammonia, so I can't determine that those -- whether the ammonia contribution was coming from inorganic ammonia or from organic ammonia using these procedures.

I do know from, from data that I have seen that primarily most of the ammonia is un-- of the un-ionized ammonia is inorganic, but there is an organic ammonia level.

But we -- I did evaluate other -- well, let me back up. The amine contributing organics are also very water soluble; and water-soluble organics, with the exception of very few polymers, are non-toxic because,

again, they stay in the water and don't pass the membranes because there's a higher affinity to stay in the water than to go into the organism. And it can only be toxic if it goes inside the organism.

MS. WILLIAMS: I think that's all I have, Mr. Goodfellow. Thank you.

HEARING OFFICER HALLORAN: Okay. Mr. Kissel?

REDIRECT EXAMINATION

BY MR. KISSEL:

Q. Yes, I just want to get this 6.25 percent stuff so I can clarify it. Can you sort of explain what that is --

A. Sure.

Q. -- Mr. Goodfellow?

A. When we set up a test, the standard test procedures would be to set up an effluent with 100, then 50 percent by sections of the effluent. It would be a whole effluent which is 100 percent, 50 percent, 25 percent effluent, 12.5 and 6.25, and a laboratory control. We selected those because we were really trying to just determine the slope of the toxicity and such.

Q. Is this a --

A. It's the standard.

Q. Right. Is there such a thing as going to 3.1

percent, or do you -- is that called for in the test procedure?

A. If I was running it as a permit compliance test, I would have run it at whatever the permit compliance point was.

Q. Did you feel it was necessary?

A. But -- no, because the objective was to determine the principal toxicants as part of the TIE. We selected this procedure because we were actually -- even though we never got to -- we actually had more toxicity statistically at the 6.25 percent to allow it to be determined as the NOEC, we did get a lot of information on the slope of the toxicity during the actual test itself.

MR. KISSEL: Okay. Thank you.

HEARING OFFICER HALLORAN: Anything further, Miss Williams?

RECROSS-EXAMINATION

BY MS. WILLIAMS:

Q. Just to reclarify, it would be possible to go lower than 6.25?

A. It would.

Q. And wouldn't it be valuable to know the definitive NOEC, no effect concentration?

A. I guess if you had another objective of the

test, but what we were asked to do back in '98 and '99 was to determine the TIE.

MS. WILLIAMS: Great. Thanks.

The only other question, I guess, I have for Counsel, you submitted as an exhibit the first test that he refers to but not the second? Is there any reason not to enter them both as exhibits?

MR. KISSEL: No.

MS. WILLIAMS: Was it just --

MR. KISSEL: I don't know.

MS. DEELY: I think we have them here if you want them.

MR. KISSEL: We used it only for Mr. Corn. Mr. Goodfellow has testified to the results. The Agency has copies of the tests and has for some time.

MS. WILLIAMS: We do. So, if the Board, I guess, wants them, they can ask us for copies if they need them.

HEARING OFFICER HALLORAN: Okay. Thank you.

MR. KISSEL: Thank you.

HEARING OFFICER HALLORAN: Miss Liu, Mr. Rao? Any questions of Mr. Goodfellow?

MS. LIU: Good afternoon, Mr. Goodfellow.

THE WITNESS: Good afternoon.

MS. LIU: Could you please identify the address of your office with the --

THE WITNESS: Yes. It is 15 Loveton Circle, Sparks, Maryland.

MS. LIU: Is that the corporate headquarters as well?

THE WITNESS: Corporate office is in actually Hunt Valley, Maryland, which is two and a half miles from our science and engineering operation.

MS. LIU: When you did the TIE to identify the specific toxicants in the effluent, your results pointed to salinity, un-ionized ammonia, and the amines; is that correct?

THE WITNESS: Correct. The first round of testing that we did, it became very highly suspicious that it was ammonia and salinity. The second round of testing that we did, we actually used what's called an EPA Tier II procedure which is trying to more definitively identify -- in this case more definitively identify the toxicity associated with ammonia, as well as other treatments to make sure that the suspicions that it was salinity were also valid.

And we added treatments and coupled them together such as Zeolite, which is a natural aluminum

silicate resin and various different pH's and graduated pH's and such to more definitively narrow it down as to the toxicant, make sure that what we were finding in the first round was truly apparent in the second.

MS. LIU: Would there be any benefit in a test like that to remove things like the ammonia and the --

THE WITNESS: We did, and the reason we used Zeolite was that that has a high affinity for ammonia removal, and, in fact, you're able to remove about 99 percent of the ammonia out of the effluent. And we did that; we still have remaining toxicity.

With the salinity that's in this wastewater for Ceriodaphnia, you would expect somewhere between 15 to 20 percent would be your acute toxicity, regardless of what else was in the effluent.

MS. LIU: So, you don't think there was anything else that might have been masked?

THE WITNESS: That's why we, we couple them in different, different proportions and in different sequences to make sure that you can determine if there is something underneath the toxicity because you can only kill an organism once, and -- you know, so you really can't determine, unless you do those tests, if there's anything underneath. And we did do the procedures to

determine there wasn't anything underneath other than it was just salinity and ammonia.

MS. LIU: Thank you very much.

THE WITNESS: Okay.

HEARING OFFICER HALLORAN: Okay. Any follow-up questions?

MR. KISSEL: None from me.

HEARING OFFICER HALLORAN: You may step down.

MS. WILLIAMS: Can I ask one follow-up?

HEARING OFFICER HALLORAN: Sure. Sure.

FURTHER RECROSS-EXAMINATION

BY MS. WILLIAMS:

Q. You were talking about that you used Zeolite?

A. Uh-huh.

Q. Can you tell us what else Zeolite removes besides ammonia?

A. Zeolite also removes -- actually it has a higher affinity for removing potassium, followed by ammonia, and then considerably lesser affinity for other salinity ions. But it's -- by far, it removes potassium first and then ammonia and then everything is -- follows a long way down the chain for removal.

MS. WILLIAMS: Okay. Thanks a lot.

HEARING OFFICER HALLORAN: Thank you. You may

step down. Let's take a five-minute break.

(Whereupon, a recess was taken.)

HEARING OFFICER HALLORAN: We're going to go back on the record; in fact, we are. It's 3:30. By the looks of the clock, it's 3:35, and right now I want to ask anybody who wants to make public comment, please do so.

Yes, sir? Now, do you want to be sworn in? And what I mean by that is if you give public comment, it's just public comment. If you get sworn in, it's a public statement, and the Board will give it more weight. And as long as it's relevant to the matter at hand, you may do so.

MR. JANSSEN: Just make a comment for right now.

HEARING OFFICER HALLORAN: A comment? Okay. You can have a seat here. You can state your name for the record.

MR. JANSSEN: My name is Richard Janssen, and I'm a former BFG employee. I worked there from 1970 to 1993. And my comment has to do with what I've heard in the last couple days. And what really troubles me is that the EPA has a standard, and now -- not BFG anymore, but Noveon says this doesn't apply, this doesn't apply. Something has to be the standard, and everybody applies to

the standard.

I look at it like a car on Interstate 80 going 90 miles an hour. And the cop stops a person, gets picked up, gives them a ticket. They go in front of the judge, and the person says, "Well, my car is high-powered. I feel better, and I save a lot of time if I do 90."

Well, the judge says you're guilty. And the person goes and says to the judge, "Well, I'll pay the ticket, I'm guilty, but I'm going to continue to do the same thing over and over again."

So, there should be a standard. The company should meet that standard, and the EPA should put the standard out, make it clear, to the point, and go from there.

I disagree with some of the statements that were made, and one of them that I disagree with is that nothing can be done to improve the quality of water that they discharge into the river. When I worked there, I was given an opportunity to work in several areas, and I assisted in the waste treatment several times. And it goes back to the process buildings where all this waste comes from. And over the years, when I first started there in 1997 -- or 1970, they made so many pounds of material. And every year, there was an expansion to make

more pounds, more pounds. And it seemed like somewhere in the '80s, they lost sight of treating the waste. It was more based on how many pounds you could make and how many dollars you were getting for this pound of material.

And what really bothers me today is I don't know how much Noveon makes off their chemicals a year, I don't -- I haven't looked into, if I could even find that out, but they would have to treat the waste, put it into the river so it's not harming the fish, the wildlife. And I'm thankful that I live up river the other way, but I do go to Peoria, Chillicothe; and I go to a restaurant, I get a glass of iced tea, you know, and I'm not able to see through it. I don't know what's in the water. This really bothers me.

My family -- I'm disabled, but my family boats in the Illinois River; my grandchildren, they play in there. And I just want the quality of the water to be the best it can be. And I think that's basically what everyone wants, is the water quality to be safe for drinking, for pleasure, for wildlife.

So, I don't have all of the degrees that a lot of people that spoke here have, and I have a disability, and I have had quite a few problems in the past, but I rely on the EPA and the Pollution Board and all the people

that work there to follow procedures.

Now, when I worked there, not everybody followed procedures. There were a lot of spills. These are not taken -- I never heard anything yet here about spills and what happens to that, you know. I, I believe the -- Goodrich trained me on several things, and one was analytic troubleshooting. And I believe this whole wastewater system to be a day-one deviation, because when certain processes run, and when some of them run together, the waste they put in is a lot different than on other days. So, you know, I was involved a little bit in the collection of this wastewater that they're talking about in the late '80s when I worked there and the '90s. And when some of these samples were taken, processes were not discharging; the actual process was not discharging into the sewer. And so I don't know how you can tell, you know, unless you collect samples, you know, at different times, when they are discharging, you know. I just don't think it was -- in my estimation, I don't think that it was the right thing, right way to go about this.

I had a couple other things here. I left BF Goodrich down there not on too good of terms; in fact, it's the only job I've ever been fired from. And I testified against BF Goodrich in 1990 -- end of '91, '92

on a wrongful death suit -- two wrongful death suits. There was a fire and explosion, killed two people at Goodrich. And I suffered from post-traumatic stress disorder, tied to blood pressure, and I've been on medication ever since. And I just want to see things at that plant, you know, because you really can't tell what goes on at that plant.

I was listening, and I heard that there was a discharge that went into the river that wasn't treated water, you know. These things in the years from '85 up through the '90s when I was fired, these things happened. And also about spills and stuff. And I can tell you firsthand, because I have the accident report right here. I was given this under court order. And this is 1991, midyear.

Carbon disulfide. I was working at the tank farm, and carbon disulfide spilled out of the underground bunker, and 400 gallons went down the ditch and was going toward the river. I was in this area by myself. I tried to get it diked up, tried to stop it as quick as I could, but I couldn't get it all. If you have a spill of carbon disulfide, when it's more than five pounds, you're supposed to report it to the federal government. Well, all they did was send out a crew with some 55-gallon drums

and try to get up as much as they could. The rest washed toward the river, and was a low place, and sunk into the ground. And these kind of things were happening.

I got wrote up for it. And they dropped -- they dropped going any farther than giving me any kind of discipline for it for the simple fact was I was doing four jobs at one time. And different people were gone, and I was the back-up for these areas. And this is the kind of thing for several years that was going on. And it's just -- well, you can see what it did to me. I mean, I haven't been right, and I won't be right. So, I just hope somebody else don't have to go through, you know, the things that I've gone through in the last 12 years.

But I have gone to the funeral of many of my friends who worked at Goodrich, and, you know, they aren't much older than I am. And there's gotta be reasons why these people came down with the things that they did when they worked at Goodrich.

And so I suppose I'm gonna catch a lot of hell from Goodrich about this, but you can expect that I am going to be filing a lawsuit against BF Goodrich for wrongful discharge in 1993. And I'm sure they're going to want to argue about that, but I am willing to go to court. My doctors have always told me they thought the stress

would not be good for me, but I plan on getting this concluded this year. So, I've tried to work with them before, have communication to Goodrich headquarters. I don't get anywhere. I hired a couple lawyers to do it for me, paid them money; evidently, they weren't working for me because they didn't follow through. But I have new legal staff now, and I have an agency that works with the people with disabilities; and I do believe that this will be, you know, the year that it's gonna happen in 2004, because I don't know how many more years I have left. My blood pressure, I've had three strokes in the last year and a half.

HEARING OFFICER HALLORAN: If I had some water I'd give it to you.

MR. JANSSEN: No, I don't need water. So, I wanted to say a lot more, but I better cut it short and do a little bit of what my doctor has suggested, take it as, as I can because I don't think that I'm going to be able to do too much more.

So, that was my comment. The EPA has a standard, and it should be followed. And that standard should be their -- they are trained in this field, and that standard should be that it's safe for wildlife, for downstream drinking water. You know, nobody should be in

the river for recreation if it's going to be harmful. But I guess that's the end of my comment.

Thank you.

HEARING OFFICER HALLORAN: Thank you very much, sir. I appreciate it.

I think, Mr. Kissel, you were going to call your fourth witness or -- is that correct or no?

MR. KISSEL: Number five.

HEARING OFFICER HALLORAN: Five. Okay. I lost count.

MS. WILLIAMS: Four today, five total.

MS. DEELY: It's fourth out of five.

MS. WILLIAMS: No. You had one yesterday.

HEARING OFFICER HALLORAN: You had one yesterday. Then I am right.

MS. DEELY: You are right. We're going to call Linda Shaw as our next witness.

(Witness sworn.)

LINDA M. SHAW,

called as a witness, after being first duly sworn, was examined and testified upon her oath as follows:

DIRECT EXAMINATION

BY MS. DEELY:

Q. Can you state your name for the record,

please?

A. My name's Linda M. Shaw.

Q. Okay. I'm going to show you what we've marked as Petitioner's Exhibit 33. Can you identify that for us, please?

A. This is a written testimony that I prepared.

Q. And is that true and correct to the best of your knowledge, information and belief?

A. Yes, it is.

MS. DEELY: I'd like to move that we admit Petitioner's Exhibit 33 as if read.

MS. WILLIAMS: Can we just clarify for the record how this compares with what was prefiled on February 6th?

MS. DEELY: What we prefiled on February 6th was redacted. There's -- the subject of Miss Shaw's testimony is financial, so we had redacted some information. I think we have went back and tried to narrow our redactions so that this testimony is in its entirety; there's been nothing removed or redacted from it. So, the public has access to the testimony.

MS. WILLIAMS: I mean, the reason I'm asking is sort of twofold: One, to make sure I have read what's in here because I've read an unredacted version.

MS. DEELY: Yes. You were provided with the unredacted version originally, so this is what you have received.

MS. WILLIAMS: And the second question then would pertain to understanding if there are outstanding trade secret claims so that the Agency is clear on what we're protecting and, you know, just to keep our files --

MS. DEELY: Okay. There are outstanding trade secrets, not in this exhibit. When we get to that exhibit, I'll address them.

HEARING OFFICER HALLORAN: So, Exhibit Number 33, do you have any objection?

MS. WILLIAMS: Oh, no.

HEARING OFFICER HALLORAN: Okay. It's admitted.

MS. DEELY: Okay.

BY MS. DEELY

Q. Can you identify that document, please, Miss Shaw?

A. Yes. This is my resume.

Q. And is that accurate to the best of your knowledge, information and belief?

A. Yes, it is.

MS. DEELY: Okay. I move that Petitioner's

Exhibit Number 34 be admitted into the record.

MS. WILLIAMS: Do we have that? A resume? Is that what you said?

HEARING OFFICER HALLORAN: Correct.

MS. WILLIAMS: I'm just making sure we have it.

MS. DEELY: Do you have it?

MS. WILLIAMS: Yes. Fine. No objection.

HEARING OFFICER HALLORAN: Okay. 34 is admitted.

BY MS. DEELY

Q. I'd like to show you what's been marked as Petitioner's Exhibit 35. Can you identify that, please?

A. Yes. This is a spreadsheet that I prepared showing the historical results of the last three years, plus doing some sensitivities.

MS. DEELY: Okay. And just to be clear, this information -- this spreadsheet we have redacted some information. We've only redacted cost information, nothing else. So, that cost information is trade secret protected and confidential, but everything else is, you know, free to Agency and public to view.

I'd like to move Petitioner's Exhibit Number 35 be admitted into the record.

MS. WILLIAMS: So, you're saying this is exactly the same thing that we were provided -- this isn't exactly what we were provided, is it?

MS. DEELY: This is exactly what you were provided, which is with the redactions.

MS. WILLIAMS: Would you mind giving us just a second to check?

MS. DEELY: Sure.

MS. WILLIAMS: Okay. Thanks. That's fine.

HEARING OFFICER HALLORAN: Okay. Petitioner's Exhibit Number 35 is admitted into evidence.

BY MS. DEELY

Q. Okay. I'd like to show you what has already been marked as Petitioner's Exhibit 11. When you refer to the memorandum of Houston Flippin dated May 17th, 2002, is that what you're referring to?

A. Yes, it is.

Q. And this is what you used to assess the various costs on the Henry Noveon plant?

A. Yes, it is.

MS. DEELY: Okay. Thank you. I have no questions for Miss Shaw.

HEARING OFFICER HALLORAN: Okay. Thank you.

MS. DEELY: You can hold onto that.

THE WITNESS: Okay.

HEARING OFFICER HALLORAN: Miss Williams?

CROSS-EXAMINATION

BY MS. WILLIAMS:

Q. So when -- hi, Miss Shaw. Good afternoon.

A. Hi. Hi.

Q. Takes me a little minute to get adjusted when -- it's easier when you go through the testimony first; it's more fresh in my mind. So, I need to get a little adjusted here.

So, just to clarify what Miss Deely said, when you analyzed the cost of treating -- the cost of implementing some of the alternatives, you based those costs on what Mr. Flippin provided to you, correct?

A. I based it on the information in that memorandum.

Q. Did you assist Mr. Flippin with obtaining data from Noveon when he --

A. No.

Q. You didn't help him at all in preparing his memorandum?

A. No.

Q. He did that, and the first you saw of it was you --

A. No, I was just asked to use these numbers and show the impact at the Henry plant.

Q. All right. Great. So, when he provided figures such as labor cost and electricity cost, you didn't question any of those?

A. That's correct.

Q. And from your testimony, you specifically looked at four of the alternatives?

A. Yes.

Q. How did you choose those four from the alternatives provided in Mr. Houston's (sic) memo?

A. Those were the four they asked me to do the financial analysis on.

Q. And "they" meaning Gardner, Carton & Douglas or --

A. Yes.

Q. Mr. Flippin has testified previously that PolyOne Corporation provides a flow of about 60 percent to the wastewater treatment plant at --

A. Uh-huh.

Q. -- Henry plant?

Are you aware of what percentage of the cost of operating that plant they provide to Noveon?

A. No, I'm not.

Q. If, for example, the cost in Mr. Flippin's memo had been 60 percent less, would that have changed your conclusions in your memo, if the cost to Noveon had been reduced by 60 percent? I assume that would have changed your conclusions somewhat, right?

A. It would have changed the results.

Q. Right. On page two of your testimony, I'd like to -- you provide several definitions of the terms in the chart?

A. Yes.

Q. And I'd just like you to explain to us, when you define -- I see it here both in the definition of volume and the definition of revenue, you use the phrase non-affiliated third parties?

A. That's true.

Q. Can you explain to us if there's such a thing as affiliated third parties or second parties or --

A. There is. What that means is that means trade sales. That means it doesn't include any transfers to -- within the company. It's actually product that is going to third parties external to Noveon.

Q. And transfers within the company means it could go to another plant to be used in the production of a different chemical, or how would that happen? How would

you have transfers within the plant --

A. Well --

Q. -- or within the company?

A. What that means is there's a very small amount of this product that is used at another plant. What I mean by intercompany sales, we have offices in Europe and offices in Asia that we transfer price to them at a certain price. We don't want to double-count those sales to them and then count their final sales. So, we just include the final sale to an unaffiliated third party in our results because you would be double-counting the same product sale.

Q. Okay. I understand how from an accounting perspective that's true, right? Would you be double-counting it for the purposes of the company as a whole?

A. Uh-huh.

Q. But that means, under your table, for the purposes of this plant that product's not getting counted at all, correct?

A. That's not true.

Q. Okay.

A. You know, we have to -- for tax reasons, you need to sell to foreign affiliated parties at a transfer

price. So, we are pricing to them at a particular price, with a little bit of margin for ourselves. But then they eventually sell that same product to a third party, so I am including in my numbers their sales of that product.

Q. So, you follow the product to the --

A. Exactly.

Q. Okay.

A. Exactly.

Q. That was definitely not clear to me from this. Thank you for that clarification.

And what you just leave out then is the markup, or you include that in eventually, too?

A. No. What we include in, in these results is their selling price, the cost to make it in the United States, or at the Henry plant in this case.

Q. Let's see if I have anything else. Can you explain on page -- I just want to understand in your conclusions here on page five and six, you talk about declines in the return in revenue from the plant, 2001, 2002 to 2003.

But for the second numbers, you provide return on net plant property and equipment, you just give 2002 and 2003. Can you explain why you didn't provide 2001 for that figure?

A. It's not available.

Q. Why is that?

A. We went to a new fixed asset system that tracks this type of data.

Q. And presumably, the reason the data only goes back to 2001 is because that's the year that Noveon was spun off or however you like to phrase it -- created?

A. I guess I just -- I chose to give you a three-year sample, you know, the most recent information.

Q. So, could you have gone back then more than three years for that type of information?

A. Well, I could have definitely gone back five years. I've been in the job since 1998. But the trend is the same.

Q. Could you say from your recollection where we were at five years ago?

A. No, I can't.

Q. And by "the same," you mean that this plant is -- what; how would you describe it?

A. That --

Q. How would you --

A. That the return on revenue as well as the return on net property is declining, not only over the last three years, but over the last five years.

Q. That's not true for the company as a whole, is it? Just for this plant?

A. I can only speak about this plant.

Q. You don't work just for this plant, though, do you? I mean, when you say I can only speak for this plant, you mean you don't have information?

MR. LATHAM: Objection.

MR. KISSEL: Objection.

MS. DEELY: I'm gonna object. I'm just gonna object. We're talking about the Henry plant, not any other facility; so, I'm just not sure why it's relevant.

MS. WILLIAMS: I think the financial health of the company as a whole is relevant to the Board in considering whether they can afford the cost of these treatment alternatives, isn't it? I mean, that's what I was trying to get at, but --

MS. DEELY: I don't --

MS. WILLIAMS: Just the general financial health.

HEARING OFFICER HALLORAN: I would overrule your objection; and if the witness can answer, she will do so.

A. I, I am not -- I don't have that information on total Noveon. What I will tell you, however, that I am

the finance manager for the polymer additives business unit. The Henry plant is one piece of that business unit.

Noveon looks at each business unit separately, as a stand-alone business, and makes -- and evaluates the results at that point.

Q. They look at each unit separately?

A. Business unit.

Q. And that -- what -- how many plants would be in the business unit that you know?

A. There's two. There's Henry and the Akron plant.

Q. Did you have a chance last week to take a look at your website, your Internet -- the company's website where they have news, press releases?

A. Uh-huh.

Q. And just generally, those press releases, would you agree, stated things like -- about 2003 -- "Sales up, third quarter, sales up, second quarter"? Are you aware of that?

A. In other business units, that's true.

Q. "Record sales, second quarter of 2003"? Does that sound correct?

A. In other business units, that's true.

Q. Okay. "Revenue of 1.1 billion in 2002." Does

that sound accurate?

A. It's in that neighborhood, for total Noveon.

MS. WILLIAMS: Okay. That's all I have. Thank you.

HEARING OFFICER HALLORAN: Thank you. Miss Deely, any redirect?

MS. DEELY: No, I don't think so.

HEARING OFFICER HALLORAN: Okay. Mr. Rao, Miss Liu?

MR. RAO: Miss Liu had a question.

MS. LIU: Good afternoon, Miss Shaw.

THE WITNESS: Uh-huh.

MS. LIU: Could you tell us where the headquarters for Noveon is?

THE WITNESS: Sure. Do you want the address? It's in Brecksville, Ohio.

MS. LIU: Does Noveon have any other plants besides Henry and Akron that produce those types of products?

THE WITNESS: No.

MS. LIU: Is Noveon a private or a publicly held company?

THE WITNESS: It's private. It's private.

MS. LIU: Does Noveon have any competitors for

the products that it produces at the Henry plant?

THE WITNESS: Yes. Yes.

MS. LIU: Do you happen to know who those competitors are and where they're located?

THE WITNESS: I can tell you who the competitors are. Flexis, Behr, Crompton are the three big ones, and there's smaller competitors.

MS. LIU: In the table that you provided, you mentioned that it only represents -- if Noveon were to pay the entire cost for a treatment alternative --

THE WITNESS: Uh-huh.

MS. LIU: -- if you were to share that cost with PolyOne, it would change these numbers. Would you be able to recalculate, based on sharing, to provide that in a post-hearing brief for us later?

THE WITNESS: Noveon has the responsibility for operating the water, wastewater treatment so the way I did my analysis was we have the ultimate responsibility for the capital investment as well as the operating cost.

There are contracts in place with the PolyOne part of the Henry plant that could potentially look at those and maybe change those, but I, I couldn't say what that percentage would be or have any idea what it would be.

MS. LIU: Okay.

THE WITNESS: Or whether they could do it.

MR. RAO: Just a follow-up question on that. You mentioned that you have contracts with PolyOne for treating their waste stream. Does that involve any, you know, certain amount of money that Noveon charges PolyOne?

THE WITNESS: I'm not close enough to that situation. Maybe, maybe Mr. Davids can help you out on that.

MR. RAO: Okay. If there is such a contractual agreement which, you know, brings in a certain amount of money for treating PolyOne's waste, is that something that you can work in your calculations to show what kind of impact it would have?

THE WITNESS: Can you rephrase it?

MR. RAO: Yeah. You know, if you're getting an income by treating their waste, like if you're charging them so many dollars per year --

THE WITNESS: Okay.

MR. RAO: -- can you put -- calculate that cost in income and see what kind of change?

THE WITNESS: These costs are net.

MR. RAO: Okay.

THE WITNESS: These are strictly what is

Noveon's cost so that's already -- so that's already been taken out.

MR. RAO: Oh, it's already been taken out?

THE WITNESS: If we are charging them for waste treatment, that is billed to them, and that is their expense. These are strictly what belongs to Noveon at that plant.

MR. RAO: Okay. Thanks.

HEARING OFFICER HALLORAN: Any follow-up, Miss Deely?

MS. DEELY: I don't think so.

HEARING OFFICER HALLORAN: Miss Williams?

RECROSS-EXAMINATION

BY MS. WILLIAMS:

Q. Just maybe to clarify the question they asked about the number of plants, you said there were two that manufacture -- how do you define it, the unit that you work for is?

A. Oh, polymer additives business unit.

Q. Polymer additives?

A. Uh-huh.

Q. How many plants total does Noveon have?

A. I want to say in the neighborhood of 20, 28, something -- in the 20's.

MS. WILLIAMS: Thank you. That's all I have.

HEARING OFFICER HALLORAN: No further questions. You may step down, Miss Shaw. Thank you very much.

Here is what we're going to do. We have to take a short break now. The Clerk of the Court informs us that she's leaving at 4:30, and we want the parties -- if they have to lock stuff up because, what I wanted to do, I wanted to finish this hearing today, but it doesn't look like it's going to happen.

My thought is -- and correct me if I'm wrong here -- to finish up Noveon's case in chief. I think you have one more witness.

MR. LATHAM: Right.

HEARING OFFICER HALLORAN: I assume the IEPA has two witnesses that will probably take a couple hours and then Noveon will probably have a rebuttal. So, it's not going to happen tonight unless we stay till 8, and I don't think anybody wants to do that.

So, let's take a short break and come back here in five, ten minutes, and we'll wrap it up for today. Thank you.

(Whereupon, a recess was taken.)

HEARING OFFICER HALLORAN: We're going to go

back on the record. Sorry about that; I had to call work.

In any event, we're back on the record. It's approximately 4:25, and I think Noveon is still presenting its case in chief.

MR. LATHAM: Right. We have one more witness.

HEARING OFFICER HALLORAN: Okay. Mr. Latham, you're on.

MR. LATHAM: Call Guy Davids.

(Witness sworn.)

MR. LATHAM: Just so everybody knows, we did not file prefiled testimony for Mr. Davids, so --

HEARING OFFICER HALLORAN: Thank you.

GUY DAVIDS,

called as a witness, after being first duly sworn, was examined and testified upon his oath as follows:

DIRECT EXAMINATION

BY MR. LATHAM:

Q. Would you please state your name for the record?

A. Guy H. Davids.

Q. What's your current address?

A. Current address is Chillicothe, Illinois. Do you want the --

Q. Could you summarize your educational

background for us, please?

A. I have a bachelor of science in chemistry from the California State Polytechnic University in Pomona.

Q. When did you graduate?

A. 1990.

Q. Prior to Noveon -- can you summarize your work experience prior to joining Noveon?

A. Sure. In chronologic order, I've worked for Chevron USA in El Segundo Refinery; that's El Segundo, California. Also worked for Betts Laboratories in Beaumont, Texas, as a technical sales representative. And also Baker Petrolite, also in the Houston area, as a business development manager.

Q. And when did you join Noveon?

A. I joined -- actually joined BF Goodrich in April 1999, and then subsequently became Noveon.

Q. What was your first position with Noveon or BF Goodrich?

A. I was hired as maintenance and utilities supervisor in the Henry plant.

Q. What were your responsibilities in that role?

A. My responsibilities were the day-to-day operation of the waste treatment facility at the Henry plant.

Q. Did you have any other positions at the Henry plant?

A. Yes, sir, I did. In March of 2000, I was appointed the production superintendent, which basically meant that I kept the existing responsibilities I had and picked up responsibilities for the day-to-day production of products in the plant.

Q. Any other positions at the Henry plant?

A. In October of 2001, I was promoted to site manager.

Q. And as the site manager, can you summarize your responsibilities in that role?

A. Yes. My responsibilities basically entailed day-to-day operation, compliance with all regulatory -- regulatory issues, meeting the business objectives, as well as the compliance objectives of the plant.

Q. In your time at the -- what's your current position with Noveon?

A. My current position is plant manager at the Noveon Wilmington, Massachusetts, facility.

Q. While at Henry, did you have any involvement with the wastewater treatment --

A. Yes.

Q. -- facility?

A. Yes. I actually was supervising the operation in my first position, and actually through all the positions I had at least -- I had responsibility and interaction at least several times a week, if not daily, in the operation of the unit.

Q. I think you testified that as the site manager you helped the plant meet its business objectives. Can you tell us a little bit more about that role?

A. Sure. Yes. The business -- the polymer additives business has business objectives as far as sales. We were charged with making the product that the salespeople would sell. We were also charged with improving efficiencies throughout the plant, both in raw materials, utilities, and throughput, through the plant.

Q. In that role, did you have the opportunity to interact with management back at the corporate headquarters?

A. Yes.

Q. Let me -- I just want to show you what's already been marked as Petitioner's Exhibit Number 35 when Miss Shaw was testifying. Can you take a look at that for a minute?

A. Okay.

Q. Have you seen that document before?

A. I believe I have seen the version that does not have the redacted information. I've studied that, that one. This one I have seen today.

Q. Okay. I just want to ask you a couple questions about -- under the heading 2003 Historical Restated for Treatment Alternatives, there's a --

MS. WILLIAMS: Mark, could you speak up just a little bit?

BY MR. LATHAM:

Q. Yes, I'll repeat that. I just want to ask you a couple questions about this column that's headed 2003 Historical Restated for Treatment Alternatives, and I'm going to focus on this box here that's called Adjusted Operating Income, Percent Return on Revenue.

As the former site manager at the Henry plant, what do these numbers show to you?

A. Basically, these numbers show that I -- that the return on revenue would be very small, if not negative, for the treatment alternatives three, six, seven and ten. Basically this product, this, this product line, this plant would be at a negative return.

Q. Negative return, meaning it would lose money?

A. That's correct.

Q. Now, as far as that, what impact, if any,

would that have on your ability to attract new capital to the plant based on your dealings with Noveon management and helping the plant achieve its business objectives?

A. Based on these numbers, I would have a very difficult time justifying essentially any capital in this plant. Not to say that I wouldn't get any, but I would have a very difficult time justifying it, and I would expect that I would get -- I would be -- I would probably be made to operate with what I could, what I could get by with.

Q. Uh-huh. Would these numbers have any -- what impact, if any, would the numbers we just discussed have on your ability to attract new products to the plant?

A. It would be very difficult to attract new products.

Q. As the site manager, with this type of financial return, would that raise any concerns about the long-term viability of the plant in your mind as the former site manager?

A. I would be concerned about the long-term viability.

Q. Thank you. I just want to show you what's already been marked as Petitioner's Exhibit Number 11 -- Mr. Houston Flippin used this in his testimony -- if you'd

just take a look at that?

A. I'm familiar with this document.

Q. Okay. Under table 1, there's flow data provided. Based on your experience at the Henry plant, does that -- are those flows consistent with what you saw when you were responsible for the wastewater treatment plant?

A. Those numbers are consistent with my recollection, yes.

Q. There was also discussion during Mr. Flippin's testimony about certain O & M costs that he included in his calculations I'd like to ask you about. If you could just take a look at table 4 --

A. Right.

Q. -- for a second?

One of the O & M costs that he has is the labor for the various treatment alternatives, and he's used a $40-per-hour cost. Are you familiar with that --

A. Yes.

Q. -- labor cost?

A. $40 per hour is a number that we would use. It is a general number that would take into account the wage, the benefits, projected overtime with a given position, and some increase in that wage over a period of

time.

Q. Of that $40, what would the wage -- hourly wage be?

A. In the area that we're talking about, an operator makes $23.60 an hour straight wage.

Q. So, would it be fair to say that the 17 -- roughly $17 would be benefits, and the other --

A. Keep in mind that based on their schedule, they're paid a premium for hours worked over 40 hours in a week. They typically work a schedule that would build in some overtime into that.

Q. So, it would be typical that they would have some overtime?

A. In a typical -- in a typical one-month rotation, the operator will be paid some portion of that at time and a half, double time for Sundays, double time for anything over seven days. And that's, that's not too common, but it does happen.

Q. Okay. There's a couple other of these costs. Are you familiar with these electrical costs?

A. Yes.

Q. Can you explain the successive kilowatt hours?

A. Successive kilowatt hours is a number that would be accurate. Again, I've been away from this

facility for a couple of months now, but my understanding is that 6 cents, 5-1/2 to 6 cents is the current rate right now.

Q. Yes?

A. And -- go ahead.

Q. I'm sorry. When this was prepared in May of 2000, you were at the facility, correct?

A. That's correct.

Q. Okay.

A. That's correct.

Q. What about the natural gas cost of 6 cents a therm?

A. Natural gas cost at the time was 6 cents. From what I understand, it would be 8 cents today.

Q. Okay. There was testimony during Mrs. Shaw's testimony about the polymer additive business, and it has -- consists of two plants, one in Akron and then the other one at Henry?

A. That's correct.

Q. Do those plants make the same products?

A. No, sir.

Q. What's the difference?

A. They make completely different -- completely different products. They go into similar end uses, but

there's no chemistry that is practiced in Akron that is practiced in Henry and vice versa.

MR. LATHAM: Thank you very much. That's all I have.

HEARING OFFICER HALLORAN: Thank, Mr. Latham. Miss Williams?

CROSS-EXAMINATION

BY MS. WILLIAMS:

Q. Why don't we just start with where you left off. The Akron and Henry plants make totally different products; no crossover?

A. That's, that's correct.

Q. Would you say all the Noveon plants make different products from each other?

A. I'm -- can you --

Q. Does it -- there are over, what, 20? How many plants does Noveon have?

A. I think 26, 28 is correct.

Q. Okay. Is it true that they all make different things or --

A. Some --

Q. -- do any of them make the same thing that they make at Henry?

A. No.

Q. Do any of them make the same thing that's made in Akron?

A. No.

Q. And there are probably other examples of Noveon plants that make things that none of the other plants make, aren't there?

A. Yes, that's correct.

Q. And when you talked about the cost component of the labor portion --

A. Yes.

Q. -- and you explained a portion of that is overtime as well as the regular wage and benefits as well --

A. That's correct.

Q. -- you said in there?

But it's not your testimony that you're going to have to hire additional staff to run any of these treatment alternatives, is it?

A. That's, that's correct.

Q. You also testified that your concern, if Noveon was forced to implement one of these alternatives at the Henry plant, is that it would have an impact on the long-term viability of the plant and its viability to attract new products, correct?

A. That's my opinion.

Q. Can you tell us when the last time was a new product line was implemented at the Henry plant?

A. Yes. After a lot of lobbying on our part, we were able to bring a new product, made -- actually made for another division within Noveon. At the beginning of 2003, we made several -- between the beginning of 2003 and my departure in December of 2003.

Q. And what department within Noveon is that that you're making those for?

A. That was personal care.

Q. Personal care?

A. Very small volumes.

Q. But even with the uncertainty of this proceeding, you've been able to attract new product lines to that plant?

A. The product lines that we were able to attract were currently being made by outside manufacturers. They were being tolled by Noveon, toll manufactured by other, other manufacturers. We were able to bring them to the Henry plant.

Q. I think that was yes, right? Yes, they were able to attract new --

A. Yes.

Q. I asked Miss Shaw about what caused her to evaluate the four alternatives that she chose here, three, six, seven and ten, and her testimony was that Noveon's attorneys directed her to look at those alternatives. Are you aware of why other alternatives were not analyzed for their financial impact?

A. I don't remember being part of that discussion.

Q. So, it's possible that some of these other alternatives might have an impact on the plant that's less than what's presented in Exhibit 35?

A. It's possible.

Q. I believe Mark asked you about the flow data provided on this Exhibit 11 dated May 17th?

A. Yes.

Q. It's your testimony that in the Total line where it says total average flow of 560 gallons per minute, that's an accurate flow value for the Henry facility, correct?

A. That's --

Q. To the best of your recollection?

A. That's a number that would be inside of what I would expect, inside the range of what I would expect.

Q. How big is the range of what you would expect?

A. I would typically see between 500 gallons per minute and 600 gallons per minute on a day-to-day basis, somewhere in there.

Q. Yesterday around this time -- maybe a little later -- I asked Mr. Giffin about some of the in-process reductions that he looked at?

A. Yes.

Q. And one question that I asked him that he wasn't able to answer I just thought I'd ask you, if maybe you know. I had asked him about how much TBA is used at Noveon. There were some figures provided about a treatment that was able to reach 5 percent reduction. We were trying to go -- back-calculate from that, and I asked him if he knew, and he said he didn't know. Do you know?

A. What number are you looking for? What are you looking for?

Q. Pounds per day.

A. Pounds per day? Off the top of my head, I don't know what that number is, pounds per day. It's going to depend on the actual production for that day.

Q. So -- yeah, would it vary? Would there be some days where it would be much less, some days much more based on what was being produced?

A. If we're not making that product, it would be

zero. If we are making that product, there would be an average amount that would be used in a day to make the product and/or process losses.

Q. I believe Miss Shaw also told us that you would be the one to talk to about contracts with PolyOne?

A. Yes.

Q. Do you want to explain how those work for us?

A. Do you have something specific, or do you want me to explain the whole --

Q. Her testimony -- well, was it her testimony? I think it was Mr. Giffin's testimony that said the costs would vary based on suspended solids, BOD, that it was complicated. So, as simplified as you can make it for us.

A. Okay. As simplified as I can make it. In 1994, the current contract was negotiated such that at the time Geon, now PolyOne, pays 55 percent of the monthly operating cost of the waste treatment facility.

Q. Well, that's pretty simple. Thank you. We'll just leave it right there.

And does that have an expiration date? I guess the contract --

A. It is an evergreen contract. We have annual -- we have the ability to adjust it annually, although it's never been adjusted.

Q. Okay. The only other thing I can recall that was -- that came up where they said, "Well, you have to ask Mr. Davids about that," was when we talked to Mr. Flippin about the information he used to calculate the PE of the facility; he said he was provided figures from you, data from July 2002 to June 2003.

A. Okay.

Q. Are you able to provide those to the Board and to the Agency as well?

A. I would expect that data should be available. Mr. Flippin should have it. I don't have access to it because I'm not in that plant right now, but it should be available. That's, that's data that's collected daily; it's daily averages.

Q. Daily averages?

A. Yes. All the data came from our data collection system.

Q. You're not required under your permits to measure daily effluent data, are you?

A. I don't -- I don't know. I don't know.

Q. I think that's -- just one second.

If I give you a -- I would like to maybe ask one more quick question. When we talked about TBA, I realize you didn't know exactly how many pounds per day

would be an average, but if I -- would a number like 10,000 be in the ballpark that you would consider as an estimate or --

A. An estimate for?

Q. 10,000 pounds per day.

A. Used per day?

Q. Used per day.

A. I, I would have to --

Q. If you don't know, you can say you don't know. But if you think that's in the ballpark or it sounds like you can give us some perspective, I would appreciate it.

A. Again, it depends on if the product -- are you looking for a daily average or over a year, or are you looking for -- again, if we're not making a product, there's none used.

MR. PINNEO: Daily average over --

A. Daily average over the year?

I would hesitate to give a number at this point in time, but probably it could be -- it could be found. It, it is -- it's relatively easily found from the plant data.

Q. Based on usage data?

A. That's correct.

MS. WILLIAMS: Thanks. That's all I have.

HEARING OFFICER HALLORAN: Mr. Latham?

MR. LATHAM: Can I take a quick, like 60-second break with the witness?

HEARING OFFICER HALLORAN: Sure. We're off the record.

(A discussion was held off the record.)

HEARING OFFICER HALLORAN: Mr. Latham?

MR. LATHAM: Yes.

HEARING OFFICER HALLORAN: We're back on the record.

REDIRECT EXAMINATION

BY MR. LATHAM:

Q. Mr. Davids, I just have a couple of other questions for you. You're familiar with the cost figures that Linda Shaw used. Can you tell us whether that includes -- that 55 percent, whether that -- those numbers account for that 55 percent of operating costs that PolyOne pays for?

A. My understanding is that Linda Shaw's analysis used numbers -- the cost numbers were Noveon's portion of the waste treatment cost.

Q. Now, you had testified in response to questions by Ms. Williams that PolyOne, under a contract, pays 55 percent of the operating cost of the wastewater

treatment plant?

A. That's correct.

Q. Are you -- under that same contract, is PolyOne required to pay 55 percent of any capital costs associated with the wastewater treatment plant?

A. Not in any provisions that I'm aware of in the contract. As a matter of fact, I do have an example of a situation we talked -- I heard testimony earlier about the expansion of the waste treatment plant to basically double the capacity. The agreement at that time was that PolyOne did not pay the depreciation portion associated with the equipment that was installed. There is -- to my knowledge, there is no obligation of PolyOne to pay the capital costs -- pay for any portion of the capital costs provided for in that contract.

Q. Are you aware of any provision in the contract that would obligate PolyOne to pay any costs of additional ammonia being used?

A. No, I'm not aware of any provision in that contract.

MR. LATHAM: Thank you. That's all I have.

HEARING OFFICER HALLORAN: Thank you, Mr. Latham. Miss Williams?

* * * * *

RECROSS-EXAMINATION

BY MS. WILLIAMS:

Q. Mr. Davids, aren't the upgrades you're referring to, weren't those in order to deal with the increases on the PC side, the Noveon side?

A. That's correct.

Q. And can you explain for us what you base your conclusion on that the figures in Exhibit 35 included only Noveon's portion?

A. My discussion with, with Miss Shaw.

Q. Prior to her testimony?

A. No.

Q. After her testimony?

A. Yes.

Q. Because when I asked her, if -- that's not what she testified to, I don't believe, is it?

A. That's what I --

Q. Do you believe that's what you heard her to say?

A. That's what I understood her to say, and she clarified that, yes. That's what I understood her to say, and that's what I clarified with her before I came here.

Q. Can we look real quick again at Exhibit 11? Do you still have it up there?

A. I don't have it up here, no.

HEARING OFFICER HALLORAN: Here you go. I got it.

BY MS. WILLIAMS:

Q. I'm looking at Exhibit 8 -- or alternative number eight, and I just wanted to ask you more specifically, is there a reason that the impact of the cost of alternative number eight was not considered?

A. Can someone tell me -- oh, let's see. What is number eight?

Q. It goes back to ion exchange.

A. Right. Can you repeat your question, please?

Q. Why you didn't plug that alternative into one of the alternatives you analyzed impact on the plant for?

A. Again, I think I testified earlier that I wasn't a part of the decision. I wasn't part of the conversation to decide which alternatives would be.

MS. WILLIAMS: Okay. Well, that's fine. Thank you.

HEARING OFFICER HALLORAN: Anything else?

MS. WILLIAMS: That's all I have. I'm sorry.

HEARING OFFICER HALLORAN: Mr. Latham, any redirect?

Mr. Rao?

MR. RAO: Yeah, I have a clarification question.

I was looking at the table prepared by Miss Shaw --

THE WITNESS: Yes.

MR. RAO: -- Exhibit 35, and for the 2003 Historical Restated for Treatment Alternatives, I was just looking at alternative three. And there is one of the items that's listed as incremental costs; and for alternative three, it's 1049; I guess it's followed by three zeros. That's the dollar amount?

THE WITNESS: That's correct.

MR. RAO: Does this incremental cost represent the annual, you know, operating and maintenance costs?

THE WITNESS: Would it be possible to look at the --

MR. RAO: Yeah, if you look --

THE WITNESS: -- previous exhibit so I can see what number three is?

HEARING OFFICER HALLORAN: Which, which exhibit?

THE WITNESS: The other one I just handed back to you, I think.

MR. RAO: If you look at Exhibit 11 on page

three, table 4 --

THE WITNESS: It looks like alternative three is alkaline air stripping of secondary clarifier effluent. It's the incremental costs Miss Shaw identifies as annual operating and maintenance cost estimates for treatment alternatives, a million dollars a year to operate the system would, would not be outside of, of what I --

MR. RAO: Yeah, it seems like it's the same number that's in this table number 4 for alternative three in Exhibit 11?

THE WITNESS: That's correct. That's correct.

MR. RAO: And you testified earlier that PolyOne would not be contractually obligated to share any costs for the -- any capital costs involved in upgrading your plant?

THE WITNESS: That's correct.

MR. RAO: Would they still contribute to the annual operation and maintenance costs, incremental annual operation and maintenance costs?

THE WITNESS: I don't -- that I don't know. It's not provided for in the current contract. I couldn't say whether they would or not. I, I feel that they would contest it.

MR. RAO: So, if you -- for whatever reason if

you upgraded the plant and your costs go up, there's still -- you know, under the contract, they can continue to pay what was your operating costs in '94? Is that how it is?

THE WITNESS: They can actually -- they can do that as a mechanism in the contract. If they dispute some cost, they can pay what they think is fair.

MR. RAO: Okay. And if they do agree to share the cost, will the numbers in the table prepared by Miss Shaw change?

THE WITNESS: I --

MR. RAO: If they contribute 55 percent of this operating and maintenance cost?

THE WITNESS: I, I would -- I would have to defer that question to either Miss Shaw or Mr. Flippin as to whether that would change or not. I'm really not sure for the purposes of this analysis. I'm not sure if I can answer the question.

MR. RAO: Okay.

THE WITNESS: I can say that they're not contractually obligated.

MR. RAO: So, there are no conditions in the contract that in case your treatment cost increases for whatever reasons that you cannot renegotiate with them, or is that --

THE WITNESS: We can renegotiate, but it's a negotiation. They can -- they can choose to pay or not pay based on the outcome of the negotiation. Ultimately, Noveon is responsible for the cost.

MR. RAO: Are you aware of whether PolyOne has other alternatives to treat their waste stream?

THE WITNESS: I would expect any alternative would be open to them.

MR. RAO: Okay. Thank you.

HEARING OFFICER HALLORAN: Thank you. Any -- I'm sorry, Miss Liu?

MS. LIU: Hi.

THE WITNESS: Hello.

MS. LIU: Are you familiar with Noveon's competitors?

THE WITNESS: Yes, I am.

MS. LIU: Miss Shaw identified some of them by name. Are those domestic?

THE WITNESS: Some are domestic, some have capacity in and outside of the U.S.

MS. LIU: For the ones that have plants that produce products similar to Noveon-Henry plant, do you know what states they're located in?

THE WITNESS: I know that there is -- one of

the competitors currently has a facility located in West Virginia. The other I'm not absolutely sure of.

MS. LIU: Thank you.

THE WITNESS: You're welcome.

HEARING OFFICER HALLORAN: Mr. Latham, anything in follow-up?

MR. LATHAM: No, sir.

HEARING OFFICER HALLORAN: You may step down, Mr. Davids. Thank you very much.

Does the petitioner have anything else to present in its case in chief? Mr. Kissel?

MR. KISSEL: Yes, I talked to Miss Williams about it. We would like to include in our case Petitioner's Exhibit 36 which is a memo dated October 30th, 1990, from Tim Clugge (phonetic) to the Industrial Unit Staff, and the subject of that is Permitting Guidance for Best Degree of Treatment Determinations. It's an Agency document which we received through discovery, FYA.

And secondly, Petitioner's Exhibit Number 37, which is a memo dated February 5, 2001, from Scott Twait of the Agency to Rick Pinneo with the subject Ammonia WQBELs, BF Goodrich, NPDES Number IL0001292 (Marshall County). Those are both Agency documents. I don't know

as they need verification.

HEARING OFFICER HALLORAN: Okay. Ms. Williams, 36 and 37?

MS. WILLIAMS: You know, do you have an extra one actually?

MR. KISSEL: Well, what happened is -- we can hold this off till --

MS. WILLIAMS: Did you take them back?

MR. KISSEL: They're locked.

MS. WILLIAMS: Oh. Because I, I thought you gave me one.

HEARING OFFICER HALLORAN: You know what? I don't want to push it. We can hold it off till tomorrow morning and revisit it, and we can pick up your case in chief if you want to.

MR. KISSEL: We are looking at a couple of minor, relatively minor --

HEARING OFFICER HALLORAN: Why don't you hold this until tomorrow.

MR. KISSEL: Okay. We have a couple of things we are looking at that came up in examination from the Board member or members of the Board staff and Agency, and we would like to -- going to take us overnight to just look at them. Not going to do as much homework as

Ms. Williams did last night.

MS. WILLIAMS: I take no credit for, by the way.

MR. KISSEL: We still have that issue of the transcript to go.

HEARING OFFICER HALLORAN: We still have the issue of the data to back up -- I forget which table it was in the Exhibit 11. We will visit that tomorrow. My inclination is to have Noveon file the data. Do you recall that?

MR. KISSEL: I remember the discussion.

HEARING OFFICER HALLORAN: I'm not sure what table, but we can address that first thing.

MR. KISSEL: Okay.

HEARING OFFICER HALLORAN: So, I guess we really don't rest, but we'll pick it up tomorrow morning --

MR. KISSEL: Right.

HEARING OFFICER HALLORAN: -- at 9.

And before I forget, based on my legal experience, judgment and observations, I find there are no credibility issues with the witnesses that testified here today.

Before I go on, do any members of the public

want to have their piece before we close up shop for tonight and start tomorrow morning at 9 a.m.?

Okay. And for the record, too, this was noticed up in the board room, but I have put a notice outside of the board room downstairs stating that the hearing is up here. And from my information, it looks like we're here tomorrow. I don't think the judge is going to be in, so that's good news.

And while I'm on the judge, I do want to thank the judge, Judge Shore, and the Clerk of the Circuit Court for their gracious hospitality; it's been beyond reproach, and we've been lucky to get the courtroom.

So, with that said, if there are no more issues, have a great evening, and I'll see you tomorrow morning at nine.

(Whereupon, the hearing was adjourned at 5:02 p.m. on February 18, 2004.)

(Proceedings continued in Volume III.)