BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:

AMENDMENTS TO 35 ILL.	)	
ADM CODE 302.202, 302.212,	)	R94-1(B)
302.213, 304.122 AND 304.301)		(Rulemaking)
(Ammonia Nitrogen)	)	

Report of proceedings had in the above-entitled cause, before Ms. Diane O'Neill, The Hearing Officer, on February 23, 1996 at the hour of 9:00 o'clock a.m. At the State of Illinois Building, 100 West Randolph, Chicago, IL, 60601.

APPEARANCES:

MS. DIANE O'NEILL, The Hearing Officer
MR. EMMETT E. DUNHAM, Board Member
MS. AMY HOOGASIAN, Board Staff

APPEARANCES: (Continued)

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

Mr. Bruce L. Carlson

Ms. Margaret P. Howard

Mr. Joel Cross

Mr. Dean J. Studer

Mr. Robert G. Mosher

Mr. Steve Vance

THE HEARING OFFICER: Good morning. This is a public hearing held by the Pollution Control Board in Docket No. R94-1 (B) entitled in the matter of amendments to 35 Illinois Administrative Code 302.212, 302.213, 304.122 and 304.301 dealing with amendments to the ammonia nitrogen regulations.

My name is Diane O'Neill, I'm the Hearing Officer for today's hearing. With us from the Board today are Board member Emmett Dunham and chairman Clare Manning's assistant, Amy Hoogasian.

And we also have with us from the board's technical staff Hiten Soni.

Today's hearing is a continuation of the hearing held yesterday on February 22nd, 1996 in this matter.

We will begin the testimony today with the prefiled testimony. At the completion of the prefiled testimony, if time allows, the Board will accept testimony from other parties who have not presubmitted testimony.

Before we get into today's testimony, we have some questions from the Board.

MR. DUNHAM: I have basically one question.

The definition of best available technology

or BAT has -- BAT has been discussed several times yesterday and in the past in this hearing, and the fundamental definition can omit at least two basic possibilities, one is by design criterion, the other is by function.

The effluent modified waters definition that has been proposed and the modifications proposed by IAWA and approved by the Agency appear to speak about a definition based on function, a plant capable of nitrifying.

But yesterday when we were talking about the costs to upgrade plants, the definitions -- the assumptions used were design criteria.

Does the Agency mean to apply a functional definition, those plants nitrifying or capable of nitrifying or are they talking about a design criteria?

MR. STUDER: I think the answer to your question is probably two fold.

First, when a facility comes in and effluent limits are determined for that facility, the first thing that we do in a construction permit process is evaluate the hardware that's available for that sewage treatment plant.

If there is a whole section in the recommended standards for sewage works in Illinois that deals with ammonia nitrogen removal.

We do have some facilities in Illinois on the other hand that don't necessarily meet the criteria of the design standards for nitrification but do, indeed, comply with limits of one and a half and four.

So the answer is the hardware is what's looked at during plant design, and definitely a facility that complies with those criteria on municipal or domestic sewage treatment basis will meet the functional definition of complying with one and a half and four.

However, if we go strictly by design criteria, we may very well exclude a number of facilities that don't necessarily meet that criteria but functionally have effluent and approximates that as a facility that was designed --

MR. DUNHAM: That was precisely what I wanted on the record. Thank you.

THE HEARING OFFICER: We can begin with the presentation of testimony.

We'll start with the prefiled testimony from

the Illinois Association of Wastewater Agencies, Mr. James Daugherty.

MR. DAUGHERTY: I don't plan to read the testimony as prefiled, but I would like to highlight a couple points.

THE HEARING OFFICER: Okay. We'll need to swear you in, have you identify yourself.

(James Daugherty sworn in.)

MR. DAUGHERTY: My names is James Daugherty, I'm employed by the Thorn Creek Basin Sanitary District in Chicago Heights, Illinois.

I'm here representing today the Illinois Association of Wastewater Agency.

Representation of that group is described in the original testimony that was presented.

The Illinois association of wastewater Agency supports the adoption of general use of water quality standards as required to protect aquatic life expected to be present in Illinois streams.

Ammonia nitrogen is known to be toxic to aquatic life and has been regulated by the Board for many years.

A large number of wastewater agencies in the state have already invested an expensive

nitrification facilities as result of existing regulations.

Because of this construction, much has been accomplished in controlling ammonia toxicity in the State of Illinois.

The proposed regulations build well upon the past controlled program.

The Illinois Association of Wastewater Agencies has previously expressed concern over the limited amount of toxicity data that was available to derive the standards, that applies particularly to chronic toxicity data.

Because of this lack of data, the Agency was forced to use an acute/chronic toxicity ratio in deriving the chronic standards.

This put some question on the accuracy of the proposed chronic standards.

In its previous testimony, the Illinois Association of Wastewater Agencies has stressed the need for additional chronic toxicity data and the probable cost effectiveness of funding such work.

Until that work is completed, the proposed standards must be assumed to be correct based on current derivation procedures for toxicity limits.

Secondly, I would like to highlight what our association sees as the most important concept, affirmed by the Agency's proposal, and that is the treatability levels defined at 1.5 milligrams per liter ammonia nitrogen summer, 4.0 milligrams per liter winter.

Treatability levels are instituted in the Agency's proposal through an effluent modified water designation.

The Association believes that 1.5/4.0 are the lowest effluent limits that should be written.

To respond to the question that was raised this morning, the Agency's proposal in trying to evaluate the impact of these regulations not being adopted, they present a cost data for plants having to meet winter limits as low as two milligrams per liter.

The Agency's cost analysis was based on a design criteria for treatment facilities that would basically double the size of aeration tanks from the current requirements.

The Association did extensive analysis of current plant performance as far as predicted effluent qualities.

We have not looked at our data, and I'm not sure our data -- we have not looked at our data to determine whether that assumption that the Agency made is correct, whether simply doubling the size of the aeration tanks would actually allow a plant to produce an effluent of two milligrams per liter in the winter.

I think that's engineering judgment that the Agency is making that has not been proven, in fact.

The third point I would like to highlight is the fact that it's important that the Board move ahead and adopt the proposal given the expiration of Section 304.301.

That leaves the state in a situation where permits are being written that cannot be met by facilities as the Agency has testified in their additional comments.

When that section did expire, our Association did not pursue an extension of those regulations since the current regulations were nearing completion of their development phase and ready for proposal.

We felt it was not necessary to extend that limit at that time because of the pending case.

We do want to emphasize that it's imperative that the treatability levels of 1.5 and 4.0 be established in the Board's regulations as soon as possible.

The last point I want to try to make is addressing actually what the definition of effluent modified water means. That's the key part of this proposal, it's been discussed by the Agency.

There's been conflicting comments that I've heard in the hearings that I've attended about exactly what that means.

Comments by the Agency seem to support that these waters will support all forms of aquatic life expected to be present in those types of streams. Other people have commented that these are areas where water quality standards are going to be ignored.

So I think it's a valid question and I would like to try to shed some light on that for the Board.

Exactly what type of water quality will be present in effluent modified water?

What is the expected frequency and spacial distribution of exceedances of water quality limits

in an effluent modified water?

The Agency in much of their testimony goes back to their mass balance calculation procedure which is procedure that's used to develop an effluent number.

The goal of that procedure is to determine a single number to put in a permit on a seasonable basis for effluent limits.

Unfortunately that procedure really didn't shed much light on the actual water quality expected on a real basis in a receiving stream.

The Agency has made some general comments, I might quote just a couple from the original testimony submitted by the Agency on page fifteen of Mr. Mosher's comments, stated that these facilities discharge receiving streams with little or no permanent upstream flow to provide dilution for the ammonia bearing effluents.

These streams at least periodically cannot be expected to meet water quality standards as herein proposed.

For Mr. Studer's comments on page fifteen -- I'm sorry, page thirteen, as I just discussed, facilities that were designed and constructed to

nitrify can expect monthly average concentrations of 1.5 milligrams per liter total ammonia during the favorable warm weather.

These facilities generally cannot comply with chronic ammonia water quality standards in cases where the pH in the receiving stream is above 7.8 and where the receiving water offers little or no dilution effects.

I believe that the actual compliance rate with water quality standards in an effluent modified water will be quite high, and I hope that my comments this morning will shed some light on that.

It's a little complicated analysis, and the reasoning that goes from step to step, so please bear with me.

I think if you stay with me and come out at the end, you'll have a clearer picture of what actually happens in effluent modified water. I'll go slowly not to try to confuse myself.

Let's start with the effluents. Our Association did a survey of a large number of treatment plants, we collected data actually from thirty-seven plants and did editing on that data for the ones that were not nitrifying, it was two years

worth of daily data.

From analysis of that data, it's clear that a facility with an effluent permit of one and a half will discharge an effluent during the summer at or below 0.5 milligrams per liter fifty percent of the time.

They will discharge an effluent at or below one milligram per liter 75 percent of the time.

And they will discharge an effluent below 1.9 90 percent of the time. These are daily discharge analysis.

This is from our survey. It's also -- these values can be found in the Agency table 12 in the original testimony. So this is actual plant effluent from a permit with one and a half.

We also need to look at the pH and temperature of the effluents. The pH and temperature of the effluents are generally lower, and they vary less than stream pH and temperatures do.

The summer stream pH is above 7.8 as in Mr. Studer's comments are common. The ratio of un-ionized ammonia to total ammonia is quite small at a pH of let's say seven and a half.

As the pH increases above that and gets up

to the 7.8 or higher point, the fraction of total ammonia present at un-ionized begins to increase rather quickly. So that 7.8 is kind of an important figure.

The analysis of effluent data shows that summer effluent pH's are almost never above 7.8. From our survey data, it showed that 90 percent of the summer pH's were below -- at or below 7.8, so only ten percent of the time are the actual pH's -- the effluents above that limit to where a larger fraction of the ammonia present is un-ionized.

MR. DUNHAM: Is that effluent data or is that instream data?

MR. DAUGHERTY: This is all effluent data.

MR. DUNHAM: Thank you.

MR. DAUGHERTY: The third factor is temperature. The same statement is true for temperature.

The temperature of effluents tend to be lower during the summer of the streams and they tend to vary less.

To try to get a picture of how this relates to actual allowable ammonias, if you select a temperature of twenty-four degrees centigrade and a pH of 7.75 which is one of the columns in the

Agency's table, that temperature and pH, the allowable ammonia based on the chronic summer standard as proposed by the Agency would be 1.65.

Using the recalculated chronic limit of 0.57, this would actually be 1.88, so 1.88 or 1.9 would be allowable any time the pH and temperature are below twenty-four degrees centigrade and a pH of 7.75.

In looking at actual pH and temperature data of treatment plants, I found that only two percent of the time does the pH and temperature of an effluent exceed twenty-four degrees centigrade and 7.75.

So I think it's clear from all these comments that effluents almost never contain un-ionized ammonia above the chronic water quality standards as they leave the plant.

We're talking about one or two percent of the time that might occur.

I'm saying that only two percent of the time are the dischargers -- only two percent of the time are the pH and temperature of the discharge above that twenty-four degrees centigrade and 7.75.

And only ten percent of the time as I mentioned earlier does the ammonia in the effluent

exceed 1.9 which is the allowable at that level.

So when you combine the two, it's even -- the probability is even less than the combination of those two that this would actually occur.

So I'm saying basically that one percent of the time or less would an effluent from a plant with a permit of one and a half actually have un-ionized ammonia present that would exceed the chronic limit.

I told you this was going to be complicated.

I think this -- some of this needs to be understood to have a true understanding of what effluent modified water really means.

All of this discussion has simply been about effluents. Now what's more important is what happens when it enters the receiving stream.

A number of things happen when the effluent mixes -- enters the receiving stream.

No. 1, mixing occurs. Mixing actually does three different things.

Typically the upstream ammonia is much lower than a plant effluent ammonia, so the total ammonia as they mix decreases.

As I stated earlier, typically the pH is

higher in the stream, so the pH goes up, that's not good because that creates more un-ionized ammonia.

The temperature also goes up, that creates more un-ionized ammonia from the same amount of total ammonia, but as I stated, dilution is diluting the total amount of ammonia.

So what is the net effect of all this? It's very hard to predict. It depends on many things.

It depends on the mixing ratios. It depends on the difference in the pH and temperatures.

It depends on the alkalinities of the two waters which is often not measured. It depends on the upstream ammonia.

Something also that happens is even if there's no dilution, we find that as an effluent enters a stream and travels downstream, the pH and temperature tend to increase gradually just due to natural causes. So even without any mixing, that's going to occur.

The third thing that occurs is nitrification. Nitrification is a natural phenomenon, it occurs in the stream.

The operation in the plant actually is using the same microorganisms that occur naturally in the

stream.

Typically nitrifying organisms are attached to the substream on the bottom and sides of the stream, so if they're present even in a small stream the rate of nitrification can be very large.

Obviously that's affected by temperature, and in summer conditions that would tend to increase the rate of nitrification.

In a large stream, the pH and temperature of the mixed stream and effluent would approach the ambient levels of the stream as far as pH and temperature and would tend to be higher than the effluent.

In a large stream there's also significant amount of mixing available.

The data presented on the Fox River by the Fox Metro facility and the Ammonia Group was a good demonstration of the effects of dilution and mixing on a large river.

In a small stream, the mixture would tend to equal the lower pH and temperature of the effluent which would be favorable in producing less un-ionized ammonia out of the total ammonia.

Gradually the pH and temperature would

increase as it goes downstream, but also that would be offset by nitrification that occurs in the stream.

Now, the events I've described occur in three dimension, the effluent mixes across the depth and width of the stream, together they travel downstream.

The three phenomenon mixing, nitrification and pH and temperature increase are all occurring in a complex spacial pattern.

Two of these work to decrease the total amount of ammonia.

The third tends to increase the fraction of un-ionized ammonia present for a given concentration of total ammonia.

The combined effect of the three is that the un-ionized ammonia in effluent which as I stated at the beginning is almost never above the chronic limits, and typically is only half of the chronic limit would be -- would generally stay below the proposed water quality standards.

Stream segment classified as an effluent modified water would have a very high rate of compliance with the proposed water quality

standards.

This analysis looked at summer conditions. Most of these same phenomenon occur in the winter, and I'm not going to go through that.

What I presented is some very hard data, real data on plant effluents that we have available and then a descriptive account of what takes place in the stream.

I believe this supports two conclusion, one, an effluent modified water would have a high rate of compliance with the proposed chronic water quality standards. Some exceptions should be expected. That is why the classification is needed.

However, the excursions are not expected to be common, probably are quite small in magnitude and may even be rare.

The second point is that it's not practical to know the frequency or the location of excursions of the proposed water quality standards in an effluent modified water.

Physical sampling would require hundreds of samples across the width and length of a stream. Such a major effort would only define the conditions on one day. The next day could be a different case.

Modeling could be used to try to predict these conditions. The above mosaic of events requires a very complex model.

Any modeling effort would require extensive calibration, and this has not been done by anyone to my knowledge.

I hope this picture is somewhat useful to the Board in understanding exactly what an effluent modified water means.

I think the most important point is that the best tool for evaluating effluent modified water impacts is a tool that the Agency presented, and that is biological sampling.

Biological sampling looks at all these events mixed together. It reflects not just present water quality on the day that the sampling is done, water quality over the previous months or year.

The Agency has testified that they have not seen biological impacts in stream segments typical of those that would be designated effluent modified waters.

I think this is consistent with the picture that I presented. I hope this is useful to the Board.

THE HEARING OFFICER: Thank you. Off the record for a minute.

(Discussion had off the record.)

THE HEARING OFFICER: I would like to enter the testimony presubmitted by the Illinois Association of Wastewater Agencies and admit it into the record as an exhibit and enter as if read. This would be Exhibit No. 51. It's the testimony from James Daugherty on behalf of the Illinois Association of Wastewater Agencies as filed with the Board on January 26, 1996, and that's Exhibit 51.

The Board also did receive some prefiled questions from the Sierra Club, however, there is no representative from the Sierra Club with us today, so I will just read the questions into the record, and allow Mr. Daugherty to answer them.

THE HEARING OFFICER: Question No. 1, why is it self-contradictory for the Agency to deny effluent modify water status and establish more stringent effluent standards?

MR. DAUGHERTY: By that statement I was meaning that the Agency has defined -- has present testimony that the best available treatment technology will produce -- only produce effluents of 1.5 and 4.0.

When the Agency issues a permit, they're issuing a permit that they're requiring to be met, and they plan to take enforcement action if it is not met, but they're issuing a permit that they have stated is not -- cannot be met with best available technology.

In this proceeding they presented cost data, cost impact of this proceedings and they have not included cost for those cases, so that's what I was intending to convey.

THE HEARING OFFICER: Question No. 2, we do not understand why the proposed revisions to Section 302.213 would improve the proposed regulations. Please explain.

MR. DAUGHERTY: We felt item one under that section which says that the Agency shall not identify water body as effluent modified if it received effluent discharges that do not meet requirements of administrative Code 304.122 prior to the dilution with the receiving water, we felt that was unclear as to exactly what was intended by that section.

It was our understanding that all dischargers to an effluent modified water would be required to meet one a a half for -- that would be

permit conditions.

If those conditions were not met, there would be standard NPDES enforcement proceedings.

It was not clear to us what additional intent was intended with that language. We felt our language was clearer.

THE HEARING OFFICER: Question No. 3, why would it improve proposed ammonia standard to fix effluent standards for the effluent modified water dischargers as in your recommended changes to Section 304.122(d)?

MR. DAUGHERTY: I'm not sure -- I don't understand the question unfortunately.

The effluent standards that we're proposing to fix with our language I think is the same as the Agency's proposal.

Part of the proposal that we were unclear about was the statement that says must demonstrate to the Agency that their effluent shall not exceed averages of 1.5 total ammonia during the summer and four in the winter.

We were not sure what was intended by must demonstrate, and we felt our language was clearer, more straight forward application of that

requirement.

THE HEARING OFFICER: That completes the Sierra Club's questions that it had prefiled. Are there any questions from the Board?

MR. DUNHAM: I actually have one. You stated that exceedances would be rare in a well run nitrifying plant.

Section 302.213(a)(2) as proposed says the Agency shall not identify a water body as an effluent modified water if it exceeds the acute standard.

Occasionally, by calculation the acute standard will be less than the effluent standard of 1.5.

Is there a possibility that -- have you discussed the possibility of occasional rare exceedances in the context of obtaining an effluent modified water body classification?

MR. DAUGHERTY: I guess I'm a little unclear. I'm not really aware of actual conditions that would produce limits below 1.5 based on acute standards -- well, very high pH's.

MR. DUNHAM: Yes. Instream pH, though.

MR. DAUGHERTY: These are instream pH, typically measured miles downstream of the effluent.

They're not pH's that would be expected in the ZID, certainly because the ZID is dominated by the effluent, probably not expected in the majority of the mixing zone, and by the edge of the mixing zone the total ammonia is probably significantly less than at the effluent, so I would not expect those conditions to occur, so I'm not sure how to answer the question.

MR. STUDER: Can I elaborate on that for a moment?

MR. DUNHAM: Please do.

MR. STUDER: You use the concept of a ZID, but the agencies indicated thtese effluent modified waters would be in very small streams, consequently there really would be no ZID and there really would not be a mixing zone allowed.

However, as you testified earlier regarding the pH and temperature of the effluent in combination with the ammonia, the Agency would expect that the acute standard would very rarely be exceeded simply because the pH in the actual effluent itself which is primarily what's being discharged to this low flow or no flow stream would be extremely low, therefore, I would not expect the pH in that stream to reach the

high numbers that would cause the acute standard to be lower than 1.5, for example.

MR. DUNHAM: My problem I guess is that the language "shall not" is a directive, and it does not admit of any exceedances of the acute standard, so if you have rare occasional exceedances in your data set, will you be able to grant or not be able to grant an effluent moditifed waters designation?

Should the definition be reworked to say exceed the acute standard 95 percent of the time or -- or not exceed the standard 95 percent of the time, to admit of the occasional possibility that a -- an even well run plant might have an upset day or an upset month?

MR. STUDER: I can never I guess rule out the possibility of ammonia upset in biological treatment for ammonia.

MR. DUNHAM: Nitrosomonas is a rather delicate organism, the process is easily upset.

It's easily washed through, it has all kinds of potentials for mischief.

MR. MOSHER: I think the Agency intends -- well, I know we intend to place the acute standard in these permits as the daily maximum concentration, so when

that rare event happens, it will go down as a permit violation.

Appropriate measures then occur. If there are too many of those violations to get that plant back in working order to avoid those types of things, so we would look at that as the safeguard for having acute standards violated in the water body itself.

MR. DUNHAM: That notwithstanding, if the effluent modified waters designation is removed because there is an occasional upset, the effect of that will be the chronic standards will take effect and you'll have quite likely a very large series of violations occurring, you could envision several more violations as a result of that.

What is the Agency's position or what is -- what is the use of multiplying or magnifying the number of violations when you have a very well operated plant and -- that has an occasional upset?

MR. MOSHER: It's not our intent to revoke the effluent modified water designation unless some extreme circumstances occur.

We feel the existing NPDES permit system is the best thing to keep plants within that -- those guidelines of best degree of treatment.

MR. DUNHAM: I guess I was looking for that statement in your intent.

MR. MOSHER: That's our intent.

MR. DAUGHERTY: Can I comment on that as well?

MR. DUNHAM: Please.

MR. DAUGHERTY: I think what -- what I understand you're getting at is the wording change that we proposed may also be applied to the acute standards, simply say in effluent modified water, the acute standards shall be met.

To clarify that what the Agency has stated would not be the case, in that one violation of an acute standard in ten years will not result in loss of effluent modified water status.

MR. STUDER: The only comment I can make is any changes in the language dealing with that, I can agree in concept, however, this proceeding is a federally mandated change, and I can't guarantee we won't get federal approval on that.

I can reiterate what the intent of the Agency is, and the intent of the Agency when we issue the permit for an effluent modified waters is to write a daily maximum in that permit that would be protective on the acute standard.

That's typically how the daily max and NPDES permits are arrived when there is an acute and chronic standard, and the permit would be written with a daily maximum that the Agency believes to be protective of the acute water quality standards.

Obviously if there's violations of that permit, then they are to try to bring the discharger back into compliance.

MR. DAUGHERTY: Do you think the USEPA thinking is an effluent modified water designation should be lost based on a single exceedance of an acute standard?

Is there any reason to believe that's their thinking, if that's the gist of the change?

MR. STUDER: I can't say with any definitive answer that that's positively their thinking.

I would guess that specifically in a case of a plant upset, that the designation probably would not be lost.

It's not the Agency's intent to do that, and I don't really believe it's USEPA's intent to do that.

Like I said, I can't say with any great degree of certainty.

MR. CUNNINGHAM: Can I ask a question of Dean? It actually goes back to a statement he said.

Dean, I believe that you had indicated that in the smaller streams where you anticipate that effluent waters -- modified waters will generally be granted, that in looking at the acute standard, you're really looking at an effluent dominated stream and you wouldn't expect the acute values to be exceeded because of that lower pH of the effluent.

Yet what -- doesn't the Agency intend to establish those acute standards based upon istream pH rather than effluent pH?

MR. STUDER: That's correct.

MR. CUNNINGHAM: Isn't there some contradiction there?

MR. STUDER: When you're discharging to a stream that has no flow in it, the stream is actually the effluent itself.

What I'm saying, as that effluent proceeds downstream, the normal process would occur and those were elaborated on by Mr. Daugherty.

MR. CUNNINGHAM: Wouldn't it also then be true that even though you wouldn't expect the actual standard to be violated that the permit limit you

would come up with, you would anticipate might be violated?

MR. STUDER: You have to remember that if you're discharging to an effluent modified water, the predominant permit limit is not going to be driven -- that permit limit is going to be driven by the chronic number.

Typically the only time the daily max in a permit is the extreme dominating or driving force is on a large body of water.

We do not expect dischargers to large bodies of water to need or to obtain effluent modified water status.

MR. CUNNINGHAM: Are there Agency questions of Mr. Daugherty?

THE HEARING OFFICER: Does the Agency have any questions for Mr. Daugherty?

MS. HOWARD: No.

MR. CUNNINGHAM: I have a couple.

THE HEARING OFFICER: Are your questions for Mr. Daugherty?

MR. CUNNINGHAM: Yes.

THE HEARING OFFICER: Okay. Go ahead.

MR. CUNNINGHAM: Jim, I believe a couple points

in your testimony you made reference to best available control technology in reference to the 1.5 and 4 limit.

I believe generally in this proceeding you've been talking about the best degree of treatment. Were you using those terms interchangeably?

MR. DAUGHERTY: Yes, I was.

MR. CUNNINGHAM: You also mate made a statement, I believe, that the -- that IAWA concluded that the Agency used appropriate procedures for the calculation of their chronic limits.

Are you aware that there are other Federally approvable procedures that would come up with somewhat different numbers than the procedures that the Agency used?

MR. DAUGHERTY: Yes.

MR. CUNNINGHAM: Okay. That's it.

MR. STUDER: I have a question. You indicated in Mr. Cunningham's last question, Federally approvable, you don't know if those mechanisms have been approved or have been examined?

MR. DAUGHERTY: I know they're present in the Federal document.

MR. STUDER: Has the methodology or the exact way that those have been derived been presented?

MR. DAUGHERTY: No, not to my knowledge.

THE HEARING OFFICER: Okay. Then I think that completes the questions for Mr. Daugherty. Thank you for your testimony.

The next prefiled testimony we have is from James Huff on behalf of the Ammonia Group.

Mr. Huff, you were sworn in yesterday in this proceeding when you answered the questions from the Sierra Club, I would remind you that you're still under oath.

MR. HUFF: Yes, ma'am.

JAMES HUFF,

called as a witness herein, having been previously sworn, was examined and testified as follows:

EXAMINATION

BY MR. CUNNINGHAM:

Q. Actually I'm not sure that we really went through this before, so we'll do a little introduction.

Would you state your name for the record?

A. James E. Huff, H-u-f-f.

Q. And where are you employed?

A. I'm employed by Huff & Huff Incorporated.
Q. And what is your position with Huff & Huff Incorporated?
A. Vice president.
Q. And have you been retained in your capacity with Huff and Huff to do some work for them for the Ammonia Group with respect to the ammonia nitrogen standard that are at issue today?
A. Yes, I have.
Q. Could you briefly outline what sort of efforts you've been involved in?
A. I've been involved in basically reviewing the Agency proposal, R94-1.

And in addition, I was project manager on a study of the Fox River that included a lot of the same lines that's relevant to these proceedings.
Q. In the course of your work for the Ammonia Group, did you prepare some presubmitted testimony for this hearing?
A. Yes, I did.
Q. Does that presubmitted testimony remain true and accurate to the best of your knowledge and belief?
A. Yes, it does.

MR. CUNNINGHAM: I would like to have that presubmitted testimony entered as an exhibit.

THE HEARING OFFICER: Do you have an extra copy of that?

MR. CUNNINGHAM: We must. Actually I left out all my extra copies yesterday and people took them.

THE HEARING OFFICER: The Board does have a copy. I'll enter it into the record. This is the revised --

MR. CUNNINGHAM: Right.

MR. DUNHAM: We have two sets, which are are you entering, both or only one?

MR. CUNNINGHAM: Both of them. They need to be really put together.

The second one kind of give directions on how it modifies the first.

Actually if you think it would be useful for purposes of this hearing, I do have a copy of the combined one that is really what is final document should look like.

THE HEARING OFFICER: I think that would be better to enter it into the record, the more complete.

MR. CUNNINGHAM: I would like to keep the pink

one because I know it's the original. Could I have those brought over to the Board this afternoon?

THE HEARING OFFICER: Okay.

MR. DUNHAM: I guess I need to say we have an old set of testimony, a new set of testimony, several exhibits and an ammonia water quality study, are you entering all of that?

MR. CUNNINGHAM: They're all intended to be part of that submission.

MS. HOWARD: Could the Agency at this time request a copy of that also?

MR. CUNNINGHAM: Sure. I missed something of yours yesterday, too. I will have to figure out what that was and get a copy of it

BY MR. CUNNINGHAM:

Q. Also, Mr. Huff --

THE HEARING OFFICER: Let's put that in, it's the testimony of James Huff, and it's Exhibit 52.

MR. STUDER: Can we ask the study be entered as a separate exhibit number?

MR. CUNNINGHAM: It was referenced in the testimony and cited as being separately attached or separately enclosed.

I don't care if you give it a separate

number or --

MS. HOWARD: It would make it easy for us to refer to.

MR. DUNHAM: Okay.

THE HEARING OFFICER: So the testimony of James Huff then is 52, and 53 would be the ammonia water quality study on the Fox River.

MR. DUNHAM: The testimony itself has attachments for the record.

MR. CUNNINGHAM: Right. Thank you.

In terms of copies, would the Board like multiple copies of the whole final --

THE HEARING OFFICER: Yes.

MR. CUNNINGHAM: Okay. Five?

THE HEARING OFFICER: Five would be good.

BY MR. CUNNINGHAM:

Q. All right. In the course of your work on this matter, Mr. Huff, have you also prepared responses to questions that were prepared by the Agency?

A. Yes, I have.

Q. And have you brought those with you here today?

A. Yes, I have.

Q. Are these them?

A. Yes.

Q. I have several copies of what is entitled a response to questions for James E. Huff by the Environmental Agency pertaining to the proposed amendments, is that what you were just referring to?

A. Yes, it was.

MR. CUNNINGHAM: Now, I presume that Mr. Huff's testimony is entered as of read?

THE HEARING OFFICER: Right.

MR. CUNNINGHAM: Mr. Huff, would you like to summarize what was in your written presubmitted testimony?

MR. HUFF: Yes. My presubmitted testimony was intended to address the questions raised by the Board at the prehearing conference of November 8th.

The six communities that I represent, I'll just briefly go through those and bring the Board up to date on what steps have been taken.

In the case of Batavia, this is a plant that currently is averaging 3 million gallons a day. The plant is designed for approximately 3.6 million gallons per day.

Over the first eleven months of 1995, it's

effluent average is 0.20 milligrams per liter total ammonia nitrogen, so Batavia has made excellent progress toward reducing it's ammonia discharge.

This has been done through taking advantage of a storm water first flush basin for equalization, providing aeration of the digested sludge prior to dewatering.

They reconditioned their fine bubble diffusers, and they installed an additional -- or operating their backup blowers to increase dissolved oxygen levels in the aeration basins.

The plant right now currently is loaded at about twice the design level for a single stage nitrification facility.

In order to meet a one and a half and four at a design capacity, Batavia's engineers have estimated $5.3 million in capital will be required.

There was four acute toxicity bioassays that were completed in 1995 on Batavia's effluent and there was no observed toxicity.

The second community is the Galesburg Sanitary District. They had a major industry in town that ceased operations July 1st, 1995 that was -- approximately 30 percent of their organic load was

contributed by this industry.

Over the five months since that industry has shut down, the district effluent ammonia has averaged 1.01 milligrams per liter.

And that can be compared to the same five months from '92 to '94 when the average was 1.64 milligrams per liter, so they've seen an overall 38 percent reduction in the first five months directly attributable to the shut down of this industry.

The district started up this past winter a several thousand gallon batch biological reactor to look at treatment of digester supernatant.

We are currently running the system right now, and we're consistently getting ammonia reductions from greater than 240 milligrams per liter of ammonia nitrogen down to less than one milligram per liter nitrogen, so the district is making excellent progress toward reducing its ammonia effluent.

In order to meet a one and a half and four effluent limits, the district would have to spend somewhere between 2.2 and $4.4 million.

The Agency is determined that Cedar Creek is ammonia impaired, and the appropriate winter limit is

1.4 milligram per liter.

We've estimated it will cost in excess of $10 million to bring that facility into compliance with a 1.4 effluent limit for the winter.

The Geneva treatment plant is designed for four million gallons a day treatment capacity.

Over the last year, they've increased the operating depth in the aeration basins in an attempt to incrase retention times.

They also placed their standby blowers in operation to increase the dissolved oxygen in the aeration basins.

1994 they averaged 12.4 milligrams per liter ammonia. During 1995, they averaged 5.1 milligrams per liter, so they also have made significant strides in the last year.

Geneva right now is currently evaluating the feasibility of pretreatment of its digester supernatant, similar to what Galesburg is doing.

On November 15, 1994, the USEPA performed biomonitoring inspections on the City of Geneva's wastewater treatment plant effluent and no toxicity was observed.

In order to bring this facility in

compliance with the R94-1 proposal, Geneva has estimated it's going to cost $2.1 million to bring that facility into compliance.

The City of Rock Falls is designed to handle 2.65 million gallons per day.

They have submitted to the Agency a plan to upgrade the aeration of its aerobic sludge digester with the hopes that that will reduce its ammonia level in its effluent.

If they're required to put in nitrification facilities, Rock Fall's engineers have estimated it will cost $2.5 million.

The City of St. Charles also located on the Fox River has a plant designed for nine million gallons a day, and it's currently running at about half the capacity.

Over the first eleven months in 1995, the treatment plant discharged an average of 2.3 milligrams per liter ammonia, significantly down from where they were several years ago.

The steps they've taken, one, they've been able to increase the sludge age and the activated sludge process. They upgraded their fine bubble diffusers in 1994.

They are just bringing on line this month a aeration system to take the digested sludge filtrate from the belt filter presses and basically put that through an activated sludge type process and trying to get nitrification.

They had done some pilot plant work. Their digester filtrate averages about 900 milligrams per liter ammonia nitrogen, very high.

And based on the pilot plant, they expect to be able to reduce that to 20 milligrams per liter in that one stream alone.

Recently they've had two series of aquatic toxicity tests conducted on their effluent by USEPA, and USEPA concluded that there was no significant toxicity observed.

My firm completed a mixing zone study for the City of St. Charles during 1995, and we attempted to track ammonia in the mixing zone, and within fifty feet downstream and fifty feet offshore the ammonia levels have reached background levels.

By 5400 feet downstream, we were also tracking chlorides, we got a dilution ratio of 75 to one at that point for conservative pollutant.

To upgrade the St. Charles facility to meet

the anticipated limits under R94-1 will cost an estimated $6.2 million.

And the last community is Sterling. They've got a plant designed to meet 3.6 million gallons a day.

They currently discharge an effluent that's as high as twenty milligrams per liter.

And as Mr. Mosher indicated yesterday, he believes they are somewhat of a unique facility, and the Agency is working with them on trying to come up with some type of zone of initial dilution that may preclude treatment costs.

If they have to put in nitrification facilities, they're looking at in excess of $10 million.

We also as part of our Fox River study, include a report on the overall Fox River fishing, sport fishing prepared by the Department of Conservation.

And the report indicates there are 61 species on Fox River, and of the top ten sport fish species since 1990, two have shown a significant decline in trend, yellow bass and channel catfish, four have shown a significantly increasing trend, the

carp, largemouth bass, the white bass and the black crappie.

The remaining four species, the bluegill, smallmouth bass, yellow perch and walleye have shown no increase or decreasing trend.

Overall the fish quality is excellent on the Fox River.

We also included in the attachments some letters from some professional sport fishermen, radio sport hosts and bait shop owners on the Rock River that indicate there as well that the fish quality has never been better on the Rock.

The one year study that we completed on the Fox River Mr. Studer talked about yesterday that I substantially concur with his analysis of what our attempt was.

We wanted to look to see if there was a problem with un-ionized ammonia on the river as a whole.

We looked at -- nineteen stations were sampled weekly along with eight tributaries over that period of time.

What we found is that the overall summer total ammonia levels in the Fox River was 0.2

milligrams per liter and the overall winter number was 0.28 milligrams per liter.

The overall average summer un-ionized ammonia was a very low 0.005 milligrams per liter and the winter un-ionized ammonia average was a low 0.002 milligrams per liter.

We ran some statistical analysis trying to compare the un-ionized ammonia concentration to stream flow, and what we found with the exception of the furthest upstream station, Algonquin, we found un-ionized ammonia levels are independent of the flow, and from that basically you can say that in order to predict worse case conditions you don't need to actually monitor the 7Q10 because the worse case condition will not necessarily occur at that low flow conditions.

At Algonquin where there was a slight correlation between flow and un-ionized ammonia, you can model back then to the 7Q10 un-ionized ammonia and basically came out that even upstream at 0.019 milligrams per liter is the worse case summer number.

We did a simplified mass balance approach taking the POTW dischargers in the tributaries and

the upstream ammonia loads and compared those at what we were seeing at our furthest down stream station, and what we found was in the winter we're getting approximately a thirty-one percent reduction in ammonia across the forty-one mile stretch.

During the summer months, that increased to forty-six percent, recognizing those are somewhat of a crude method of doing that, and also that we weren't taking into account all the loadings on the Fox River.

There were other loadings that would contribute to that, so I think you can take those numbers and conclude that they're very conservative because there's really more loading going in than what we were able to account for.

We found no recorded exceedances of the 1.5, 0.04 milligrams per liter of the current water quality standards.

And for the proposed .050 and .020 milligrams per liter on a four sample basis, we found no violations over the one year period as well.

One of the concerns that we have had and I think continues is in the use of the conservative mass balance approach is the 75th percentile

temperature and pH in the location at which those samples are to be collected.

There seems to be quite a variation in the distances downstream that are being utilized in deriving those numbers, the amount of data that's required, Mr. Mosher addressed that yesterday, in some cases five years, in other cases two years, and that's probably one of our largest concerns is the implementation of the effluent limits from whatever water quality standard is adopted.

The water quality standards, we have some concerns that based on the Agency data that they've identified 120 facilities, and 94 of those major facilities will end up being designated as effluent modified waters and nine others may need effluent modified waters designation, so you're going to have 86 percent of all major nitrifying facilities in Illinois basically exempted from the .020 and the .050 un-ionized standards.

Going back to what the Ammonia Group originally -- one of the things we asked for, going through my testimony, I go through numerous things, but I think the biggest thing, a concern we have is this mass balance procedure and being allowed to

recognize alternatives to that, including stream monitoring to establish whether, indeed, there are acute or chronic water quality violations outside the zone of initial dilution or at the edge of the mixing zone.

I think the final point that I would like to make is the Agency, when they did their economic impact, looked at the existing effluent levels compared to what the -- they have predicted based on their mass balance procedures.

The problem with that is that they're basing that strictly on the existing loadings on these plants, and all of these communities have expended considerable sums of moneys to allow for future growth, and by not factoring that into the economic impact, these communities are going to be hurt because we know they're designed much above the acceptable design loadings for single stage nitrification facilities.

At some point in time, they're not going to be able to meet those effluent limits without expansion, and they had already basically designed these facilities for this future growth, so what you're going to find is a lot of facilities that

maybe they can meet the standards as proposed today, but they're effluent limits in the future are going to require significant upgrading that they thought they had already planned for as part of their original design of these treatment plants. Thank you.

THE HEARING OFFICER: That completes the testimony.

You did have prefiled questions from the Sierra Club, but they were addressed yesterday at hearing.

And we do have the prefiled questions from the Agency. I think we'll enter the prepared responses that you've given me, we'll enter that as an exhibit.

MS. HOWARD: Can we have a five minute break before you do that because we would like to take a look at the attachments to that response that we've been handed this morning to consider the relevancy as they apply to specific questions that we asked.

THE HEARING OFFICER: We'll take a five minute break -- let's enter this as an exhibit.

MS. HOWARD: Well, we might want to object to it totally being entered as an exhibit, and that's why

we might need to take a look at it.

MR. CUNNINGHAM: It might be useful for me to state I believe the only attachments to that exhibit are documents that were provided to me pursuant to the Freedom of Information Act requested to the IEPA and consists of mass balance calculations for various facilities since I believe September of 1994.

MS. HOWARD: Correct. It was a Freedom of Information Act requestd, however, when we received Freedom of Information Act requests, we don't necessarily know when or where those documents will show up, and we just want to check to make sure that they're relevant to the specific questions we've asked in this specific case.

THE HEARING OFFICER: Let's take a five minute break.

MR. CUNNINGHAM: Actually still I've been corrected. Mr. Huff tells me there are a couple of other attachments that might be useful to have him describe those.

MS. HOWARD: That would be fine.

THE HEARING OFFICER: Okay. Go ahead. Describe the additional attachments.

MR. HUFF: Attachment A consists of a two

regression analysis in response to one of the Agency's questions about the correlation between flow and pH.

And attachment B includes what Mr. Cunningham represented plus the table that I put together from the rest of the mass balance calculations that we received under the Freedom of Information Act request.

MS. HOWARD: Okay.

THE HEARING OFFICER: Let's take a break so the Agency can look at the prepared responses.

(Short break.)

THE HEARING OFFICER: Does the Agency have a --

MS. HOWARD: No. Actually after taking a look at the document, what the Agency has found, that the written answers were -- except for three of the answers were pretty complete, and what we would think would be a good idea is to enter the answers as read into the record, and then just allow us -- we just have follow ups on No. 4, No. 20, and No. 21.

MR. DUNHAM: Thank you for saving us some time.

MS. HOWARD: No problem. We just wanted to make sure.

THE HEARING OFFICER: So we can enter the -- does

the Ammonia Group have any objection to doing that?

MR. CUNNINGHAM: I have basically no objection to doing that.

There was one question I believe that Mr. Huff wanted to elaborate on, but I don't think it's on that list --

MR. HUFF: Yes. It's on the list.

MR. CUNNINGHAM: I have no objection to that whatsoever.

I actually noticed I have a few additional copies of a faxed version of this, there are three more if anybody wants those.

THE HEARING OFFICER: Okay. So we'll enter the response to the questions for James Huff by the Environmental Protection agency with the attachments, enter it as if read, entered as Exhibit 54, and then we allow the Agency to present some follow up on those questions.

MS. HOWARD: Actually before we go ahead with the follow ups, why don't -- if Mr. Huff has to elaborate on one of his answers, which one was it, No. 21?

MR. HUFF: Twenty-one.

MS. HOWARD: Why don't you go ahead, our follow up may be even more direct or it may have been

answered.

MR. HUFF: Let me read 21. The question was: On what basis do you conclude that in cases of dischargers to small streams where the chronic standard is not exceeded, the dischargers total ammonia limit will be based upon existing effluent quality.

After I prepared my response, in reviewing the files for today's hearing, I went through the Agency's original exhibits that they submitted, and the original Exhibit L was entitled Illinois Permitting Guidance for Mixing Zones, and on page 9, item 4 under that, I would like to read the first paragraph which states:

> "Existing effluent quality. When mixing is allowed, the permit writer must implement permit limits corresponding to existing effluent quality.
>
> "This procedure goes beyond the granting of safe effluent standards or other indicators of best

degree of treatment at default permit limits.

"When the discharger has demonstrated through the years that the treatment system is in place, can exceed the performance dictated by the technology based permit limit, permit limits reflective of the exiting abilities are in order.

"The TSD provides a procedure for determining the maximum expected effluent concentration expected given past plant performance."

That's all I wanted to supplement.

MS. HOWARD: We have a follow-up on question No. 4.

MR. STUDER: You indicated in question four that there were provisions for future growth included in the Batavia sewage treatment plant.

Could you describe what those provisions are?

MR. HUFF: In general terms, I can. It's the placement of the blower lines, the way the aeration tanks and the clarifiers are set out, that plant today could be physically expanded on the existing piece of property.

If they expand and put in nitrification facilities, that basically land locks the plant, takes the adequate piping and the list stations to capacity so that if they were to expand in the future, they would basically have to build a brand new plant.

I have only one copy, these were prepared by Batavia's engineers, I don't know if it's appropriate to put these in the record, but this is what Batavia's design engineers proposed if they were to expand the plant and basically go -- forego any ability for future growth at this plant.

Basically once it reached its design capacity, they would have to build a brand new plant, and this was the alternative design that came up with where they put in nitrification but would still have the capabilities to expand this plant in the future

should growth occur.

And there was a significant difference, I believe it was like 3.3 million to 5.3 million to do that, and these charts basically were the layouts that went along with what the design engineer came up with.

MR. STUDER: Do you know if Batavia is currently planning on expanding the plant?

MR. HUFF: Batavia is currently at 3 million gallons a day, and the plant's only designed for 3.58 million gallons per day, so they're running in excess of 85 percent of design capacity right now.

As the Agency has noted in several of its submittals, the Fox River area is an area that still enjoys some growth in this state, so I can only speculate, but the answer is yes, that probably in their twenty year plan calls for expansion of sewage treatment capabilities.

MR. STUDER: But you haven't seen any definite plans for plant expansion?

MR. HUFF: That's right. That's beyond anything I've done for the City of Batavia.

MR. STUDER: Have you seen any documents --

MR. HUFF: No, I have not.

MS. HOWARD: We have a follow up for No. 20.

MR. MOSHER: You identify -- well, the question in 20(a) asks for a list of major municipal facilities which would not require effluent modified water status if the 0.030 milligrams per liter chronic ammonia standard was adopted.

And you give Patoka School as I read it as the only facility that you have so identified. Is Patoka School a major municipal facility?

MR. HUFF: I would presume not. I'm not sure what the definition of a major municipal facility is.

Maybe you could give me that definition. I can answer that better.

MR. MOSHER: It's one million gallons per day, design average flow or more, and it receives primarily domestic sewage waste.

MR. HUFF: I would presume it's not a major -- it's probably a minor.

MR. MOSHER: So then is that to say that there are no major municipal facilities you can identify?

MR. HUFF: That's correct. You know, I don't have the data base and the luxury of having all the mass balance calculations that have been done by the

Agency on majors, but I presume you do.

MS. HOWARD: Isn't it true, though, that you do have the major -- the municipal data book that you requested in another proceeding in which we gave you all of the major facility data sheets in that municipal data book?

MR. HUFF: You gave me the effluent ammonia, but you need 75 percentile and temperature in the streams which is not in there.

MS. HOWARD: Right. But that does identify the major municipals that exist.

MR. HUFF: Yes. But it doesn't provide the data to answer the Agency's question.

MR. STUDER: You so you have a list of the major facilities?

MR. HUFF: I presume I do. But I don't have the 75th percentile.

MR. CUNNINGHAM: Except for those that are included in your attachments?

MR. HUFF: Right.

MS. HOWARD: No. 21.

MR. STUDER: I would like to respond to twenty-one.

Mr. Huff is correct when he says the interim

ammonia effluent limits for St. Charles, Batavia and Galesburg were calculated based on a statistical analysis of the treatment plant performance, however, the Agency does not routinely calculate final permit limits based on that approach.

Based on Federal regulations, the Agency must calculate permit limits and write permit limits in an NPDES permit which are protective of the given water quality standard.

That would also hold true for ammonia. Although the Agency technically doesn't classify ammonia as a toxic, I believe Federally it's classified as a non-conventional pollutant along with chlorine.

It is treated as a parameter that does have to have an NPDES permit which would protect further water quality standard.

Typically the Agency will calculate an essentially interim limit in an NPDES permit based on what the given treatment plant is capable of doing.

That is generally followed by one of two options. One option would be as was done in the case of St. Charles and Batavia, the permit will contain a re-opener clause for that specific parameter in which

the Agency may later modify that permit to include either a construction schedule or final limits that are protective of water quality.

In the case of Galesburg which that permit I might add is under appeal at the present time, the interim limits were calculated based on statistical analysis of the treatment plant's performance, and that permit at that time did contain a compliance schedule for the achievement of final permit limits that are protective of water quality.

MR. HUFF: Could I ask just a couple follow-up questions to that?

THE HEARING OFFICER: Go ahead.

MR. HUFF: Getting right to the bottom line, the Agency never will -- will never write a permit less than one a half and four?

MR. STUDER: I didn't say the Agency will never write a permit for and one and a half and four.

MR. HUFF: But based on plant performance, they will never write one below one and a half and four?

MR. STUDER: Our current intentions as far as effluent modified waters are to include permit limits of one and a half and four at facilities that qualify.

MR. HUFF: Excuse me, take the effluent modified water criteria off now.

What if you're on a stream that doesn't have any water quality violations, therefore, EMW isn't appropriate. What kind of limits will you set for that discharger?

MR. STUDER: The discharger will receive limits that are protective of water quality.

MR. HUFF: Could they be lower than one and a half and four?

MR. STUDER: It is conceivable that they could be lower than one and a half and four if that facility by the statistical analysis indicates that they are capable of achieving those limits.

MR. HUFF: Which is exactly what my response to what my question answered, thank you.

MS. HOWARD: That's all we have.

THE HEARING OFFICER: Okay. Are there any other questions for Mr. Huff?

MR. DUNHAM: I guess I have a couple. One is the costs that you seem to -- that you gave this morning for compliance with this proposed regulation appeared to differ from the revised estimated cost of compliance given by the Agency in their comments.

Can you explain any of the differences?

MR. HUFF: I don't think I want to speak for the Agency's numbers.

The numbers that I derived were actually done in most cases by the city's engineers that have looked at this.

Go back to Sterling, I think Sterling is an interesting case where you have Mr. Mosher saying this is a unique situation, he alluded to acute toxicity at the high levels, and he's going to somehow derive a unique zone of initial dilution that's going to take them out of this economic impact.

MR. MOSHER: I would like to qualify that. I never said that about Sterling.

I said that about -- yesterday Rock Falls and St. Charles were the two communities I mentioned that had high ammonia levels and acute toxicity. I didn't say that about Sterling.

MR. HUFF: Well, you identified Sterling as a unique case that they're going to come into compliance through a unique zone of initial dilution interpretation, Agency interpretation.

So you have Sterling on the one hand that's

got an estimate of what's in my testimony, and they've got their fingers crossed that what the Agency is representing here is going to turn out that there's not going to be any economic impact on Sterling's case.

And, you know, I guess that goes back to a large degree to allowing the Agency to continue to use this mass balance procedure without any Board guidance on how that's to be implemented, where you take the pH and temperature samples and whether or not you can allow real data to be used in lieu of a very conservative methodology to set effluent levels.

MR. DUNHAM: The second question is in your study of the Fox River, does pH appear to be seasonal?

MR. HUFF: If you'll bear with me for just a moment.

MR. DUNHAM: Part of the reason I ask that is I don't recall exactly whether it was in your study or in Agency testimony that I read that one of the factors leading to a high pH in the Fox River basin is the low dams that allow for backup of water and algal growth which would definitely be a seasonal problem.

It would be a -- specifically a summer, fall problem, not a winter problem.

MR. CUNNINGHAM: Take a look at that.

MR. HUFF: Sure, if that's okay. I'm pretty sure I know the answer.

We found that the summer average was 8.3 and the winter average was 8.3, and the maximums in both cases, 9.1 pH units, and that's looking at the river as a whole.

We also developed 75th percentile numbers for both summer and winter, and they're really pretty close as well.

In some cases, the summer is higher, in some cases the winter number is higher.

I think what else is of concern is the data we generated in this report, these nineteen stations, the pH numbers are consistently higher than the numbers that the Agency has used in calculating out effluent limits.

The significance of that is these numbers more accurately reflect the pH in the Fox River, the communities, the Batavia, St. Charles and Geneva, their effluent limits are going to be even lower than what the Agency calculated, and the same thing for

Fox Metro.

MR. DUNHAM: Because it's important pH is a logarithmic scale, can you tell me how you calculated the average pH?

MR. HUFF: We took it -- it really --

MR. DUNHAM: It's the mean of the values?

MR. HUFF: Right, it's the mean of the values.

MR. STUDER: Do you have any documents where you use --

MR. HUFF: Withdraw that. I was thinking of the 75th percentile which is more of a median type number, and the median perhaps would be better to use there.

MR. DUNHAM: In the instance that pH might be seasonal, would the Agency consider the possibility of calculating different acute numbers based on pH by season?

Since they're already calculating acute numbers for summer and winter, would you use a different data base if there is this proof that there's a seasonal?

MR. STUDER: When we calculate permit limits, we already take the data base and split it into summer and winter.

MR. DUNHAM: So a 75th percentile of the summer values, 75th percentile of the winter values?

MR. STUDER: Right. And the same with temperature, obviously you can't use 75th percentile, and that's why that's done.

MR. DUNHAM: My next question is your -- part of your proposal was to use actual instream pH and temperature data at an agreed collection point in lieu of the date as a cutoff for summer versus winter ammonia values?

MR. HUFF: Not in lieu of.

MR. DUNHAM: Let me finish. Would this be an ad hoc daily decision whether you wanted to use the summer or winter or would this be a fixed data point where you had a continuous monitor for pH, continuous monitor for temperature, and you made an agreement with the Agency that it would be done on that basis, on a continuum basis?

MR. HUFF: I think it goes back to a case by case basis.

In most cases as I understand the Agency's permitting procedure, they require the dischargers to monitor effluent ammonia, this would have absolutely no bearing on those dischargers whatsoever.

There are some dischargers in the state that the Agency has required that they monitor stream ammonia pH and temperature.

In addition, the Agency has their own monitoring program where they monitor at various stream six times approximately per year.

My concern is any of those samples, they go out on the first day in November and they find an un-ionized ammonia above 0.02, but the temperature is above twelve degrees centigrade, that that's going to be earmarked as a violation, and there's a potential enforcement action then for causing or contributing to.

Now, the question was raised yesterday, but if it's a four day average number, that's not going to happen any longer because you would have to do that four days in a row, but the potential -- you have dischargers, for example, the Galesburg Sanitary District that's required to monitor five days a week at the stream at numerous points.

They monitor five consecutive days in the first week in November and it's warm, and if they're above .02, that's a water quality violation.

And the Agency's on record saying that any

violations of a water quality standard is not acceptable, so all I'm trying to do is say, if we're really trying to protect water quality here, why are we calling that a violation when the Agency's data base says the appropriate water quality standard should be 0.05 when the temperature is above twelve degrees centigrade.

So I think our proposal would just be to basically whenever instream ammonia is measured for whatever purposes, the applicable water quality standards would be based on the temperature at that time. It wouldn't affect the effluent limits one iota.

MR. CUNNINGHAM: Could I follow up on that a little bit?

First of all, I think the Agency actually takes nine samples, you said six.

MR. MOSHER: That's right.

MR. CUNNINGHAM: In earlier comments of the Ammonia Group, the proposal as we drafted it is a one way deal, that we can take advantage of a higher limit, but we had later -- we specifically that, yes, it should be a two way street, that if we go out and we do this monitoring and we find temperatures below

twelve degrees C during what would otherwise be a summer month, that the more stringent limit would apply, but I think we do envision it pursuant to some sort of agreed upon monitoring program with the Agency or as applicable to Agency grab samples.

But one way or another the Agency would be involved in the decision where you're doing to do that sampling and you use the data from that particular point.

MR. DUNHAM: I guess I wondered if the Agency has anything further to say on that.

MR. STUDER: I guess my only comments would be -- to implement that would be a nightmare.

For example, when you get sun shining on a given receiving stream the temperature can change, it can change dramatically.

Given the fact that most sewage treatment plants discharge effluent in the neighborhood of twelve degrees C, you're going to have extremely close values to twelve degrees C in that receiving water, and to pick a point is going to be very, very delicate.

I think this proposal was also commented on by Region 5 and was deemed not to be acceptable to

them.

It was brought up at the hearing over a year ago. That's all I have.

MR. MOSHER: I would like to add that for effluent modified waters, there's no reason for any daily sampling of pH and temperature in the stream to show any compliance with chronic water quality standards for ammonia because that facility has technology based limits for the daily maximum. They are relieved from the chronic standards.

So it would be pointless to go out and sample pH and temperature in a stream on that daily basis.

We would have to establish a pH, temperature value seasonally, apply it to use for setting the acute standards for those facilities, but not for the -- daily maximum permit limits based on the acute standards, but not for the monthly average permit limits based on the technology based relief of 1.5 and 4 limits.

MR. DUNHAM: Well, we're in the process of writing a rule, and to the extent that there's a recognized difference between high and low temperature and to the extent that we have to have a

cutoff for workability of the rule, if it makes any sense at all to have an exception for those who are willing to go the extra step and continuously read temperature, I thought it ought to be in the record whether we could or could not.

I do not want this to become an ad hoc decision that in a given sample the temperature was 12.5 degrees on someone's dial thermometer, whether or not that thermometer was calibrated and, therefore, the higher or lower standard should apply.

If on the other hand we did this right, it would be technologically feasible I think.

MR. STUDER: I think we need to comment also on the way in which the standards were derived.

The toxicity data is generally grouped into around twenty degrees C and ten degrees C.

You will find very little toxicity data between ten and fourteen, and the point I would raise to the Board to consider is whether or not the record supports a cutoff point of twelve degrees C if they so choose to implement that.

MR. DUNHAM: The twelve degrees C was proposed by the Agency specifically because there was a paucity

of data in that range as I recall. I believe that is in the record.

MR. STUDER: I believe the point raised was the fact that there was no scientifically defensible way to establish that as a cutoff point for a day to day standard change.

MR. DUNHAM: Okay.

MR. CUNNINGHAM: I would like to ask a related follow-up question of Mr. Huff.

Mr. Huff, I believe yesterday you responded to a question asked by Mr. Studer as to how you would go about determining compliance when you -- as you go above and below twelve degrees C.

Do you have anything to add to the statement you made yesterday?

MR. HUFF: Yes.

Upon further thought, I think one easier way to determine compliance would be just to normalize the data, that is if the temperature is above twelve degrees C and you're taking a four day average, you would take the value and divide it by .05, and if the temperature is below twelve degrees C, and you would divide it by .02, just sum up the four days, and if the value is greater than one, it's a violation.

The same type of concepts are used in industrial hygiene when you have multiple parameters, so you would normalize the data, and if the average came above one, you would have a violation.

THE HEARING OFFICER: I think that completes the testimony and questions for Mr. Huff. Thank you.

Mr. Buchner requested to make a statement on the record regarding his testimony yesterday. If you want to come forward or.

I remind you that you were sworn yesterday and that your testimony or statement is considered under oath.

MR. BUCHNER: Thank you.

Yesterday during the course of my testimony -- well, there are three different areas that I would like to address to clarify.

No. 1, I think we came to an agreement that the reason the Agency's values and the values found in the Fox Metro report disagreed was that we were using some different data bases, and so I want to go on the record to clarify the numbers in the data base that the Agency used.

Those were, in fact, numbers generated from the data base for the five years' worth of data

from -- let's see if we have the time period, from June 5th, 1985 through December 26th, 1990, and in addition to that time period, the values used in the Fox Metro report; is that correct?

MR. VANCE: That's correct.

MR. BUCHNER: And that the upstream ammonia nitrogen values that were used, I don't believe we did address that yesterday, that the -- is that the long term value that I had referred to in yesterday's testimony which I believe was .12 milligrams per liter for the summer and .26 milligrams per liter during the winter?

MR. VANCE: That's correct.

MR. BUCHNER: And that the un-ionized ammonia values which were used in the calculations were 0.2 for the summer and 0.5 for the winter as opposed to the --

MR. VANCE: That's correct.

MR. BUCHNER: Based upon those numbers, I'll go back and double check, I'm confident that we'd probably be in agreement.

Also during yesterday's proceedings, I expressed my surprise at the Agency's numbers that they came up with.

And I think one of those reasons for my expression of surprise, I believe I misheard one of the numbers that the Agency read.

I had heard 1.4 as a chronic limit for the summer, and I thought it was a 4.9 chronic for the winter.

And I believe -- do you want to correct me on that?

MR. VANCE: The correct value for the chronic is 1.9 in the winter.

MR. BUCHNER: And with my understanding of that, the 1.9 chronic value for the winter in response to Mr. Huff's question from yesterday when he asked me if I would have any problems whatsoever with those numbers, I would have to change my testimony.

In the winter months, I think Fox Metro would have a concern with the 1.9 winter value, and I base those concerns upon the following factors: No. 1, the -- even though we have in recent years not seemed to have had a problem to meet those values, we have been as indicated in my previous testimony only about a 66 percent hydraulic flow of our design average flow, and during the winter months, we are using 80 percent of our available tankage to achieve

those numbers.

During the summer months we drop down to using only 60 percent. So during the winter months that would become a concern.

We also know that during the winter months that the temperature of a raw influent will drop down to anywhere between ten to twelve degrees centigrade, and I believe that's sort of a key number for nitrosomonas, and so that I think becomes a concern.

As of today, for example, we're in a critical time period for the district as far as temperature goes, we're retching some of the lowest temperatures that we experience in the winter months, and those I think are attributed to two factors, No. 1, just the coldness which is penetrating into the ground gets down to the level of the collection system, and also the -- during the spring when you're having some of the snow melt and some of the influent comes into the system would also affect the temperatures of the influent.

So those are the two reasons why our temperature drops down to those low levels.

In addition, within the past year, the district has put on line centrifuges. In the past,

we have used bell filter presses. In the past we have been able to regulate the ammonia and filtrate from the belt filter presses by running fewer presses during the day and more presses during the evening.

One centrifuge has taken the place of essentially three or four bell filter presses, so during the past year with this new process installed, we don't have a whole lot of operational data on how that might impact our plant.

So I will have to carry the revised number back to our district, give that to our engineer, and I believe that that is going to be a concern to our district engineer as well as to our operational staff.

And finally in response to a question from the Sierra Club regarding natural pollution and regard to the pH, we indicated that the limestone river bottom seemed to be one of the primary causes, and there was a passing reference made to the algal blooms, and what I failed to bring up yesterday was I wasn't sure if algal blooms would be a problem during the winter months.

And during our one year -- during our one year study for the past year, the 75th percentile pH

for the winter came out to be 8.76 which was higher than the 75th percentile that we had obtained for the summer months, 8.51 which sort of, you know, on the basis -- admittedly only the one year's data, that -- to me that suggests that maybe the algal bloom wasn't the cause of the high pH, and it was indeed as the Agency has testified that it was probably due to limestone, naturally occurring limestone in the river. That will conclude my further comments.

THE HEARING OFFICER: Does the Agency have any questions?

MR. MOSHER: Can I clarify a point? You mentioned 1.9 chronic value I think, and that really means a monthly average winter permit limit of 1.9, so if there is a distinction, it's a permit limit, not a water quality standard.

Have Aurora is getting a mixing zone that allows for some higher permit limit than what the water quality standard itself dictates.

MR. BUCHNER: But the 1.9 would be the effluent -- the chronic effluent limit; is that correct?

MR. MOSHER: It would be the thirty day average permit limit in the wintertime.

MR. BUCHNER: Yes. I understand that.

MR. MOSHER: I'm just trying to make the distinction between water quality standard and a permit limit here.

THE HEARING OFFICER: Mr. Cunningham has some questions.

MR. CUNNINGHAM: I guess it's kind of a question.

You made reference to a question asked by Mr. Huff yesterday.

MR. BUCHNER: I believe it was Mr. Huff.

MR. CUNNINGHAM: I think it was me, just to clarify the record, it was a question that I asked, Mr. Buchner.

THE HEARING OFFICER: I think that's it. Thank you.

Is there anyone else that wishes to testify or place a comment on the record? Off the record a minute.

(Discussion had off the record.)

THE HEARING OFFICER: Go ahead.

MR. WESSELHOFT: For the record my name is Chuck Wesselhoft. I'm with Ross & Hardies. I'm here representing Granite City Steel.

Granite City Steel discharges into Horseshoe Lake. Is it the Agency's belief that Horseshoe Lake will be able to qualify for effluent modified water?

MR. STUDER: I believe that question was answered in Springfield.

MR. WESSELHOFT: Not quite.

MR. STUDER: There is nothing in our proposal that would disqualify Horseshoe.

MR. WESSELHOFT: Any concerns about Horseshoe Lake in particular?

MR. STUDER: I would have to go back and look if we have any data on Horseshoe Lake. I can't say yes or no at this point.

MR. WESSELHOFT: That's the extent of my questions.

THE HEARING OFFICER: I believe that completes our hearing in this matter.

I will upon the receipt of the transcript issue a Hearing Officer order that will establish the next action in this proceeding. Hopefully it will establish a period for the submission of comments or final briefs.

But I would like at this time to remind all the parties that any additional filings in the way of

comments or briefs need to be served on all members of the service list, and we do -- the Board does constantly update that service list, so it is important before you send it out that you receive an updated copy of the service list from the Board. That completes the hearing for today. Thank you.

(Which were all proceedings had in the above-entitled cause.)

STATE OF ILLINOIS)
) SS:
COUNTY OF C O O K)

Susan Maul, being first duly sworn, on oath says that she is a court reporter doing business in the City of Chicago; and she reported in shorthand the testimony given in the hearing of said cause, and that the foregoing is a true and correct transcript of her shorthand notes so taken as aforesaid.

CSR

"OFFICIAL SEAL"
SUSAN MAUL
Notary Public, State of Illinois
My Commission Expires 9-7-98

SUBSCRIBED AND SWORN TO before me this 11 day of May, A. D., 1996.

Notary Public

OFFICIAL SEAL
MARILYN MACIASZ JAMES
NOTARY PUBLIC STATE OF ILLINOIS
MY COMMISSION EXP. SEPT 5,1999