ORIGINAL

ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
WATER QUALITY STANDARDS AND	)	R08-9
EFFLUENT LIMITATIONS FOR THE	)	(Rulemaking -
CHICAGO AREA WATERWAY SYSTEM	)	Water)
AND LOWER DES PLAINES RIVER	)	
PROPOSED AMENDMENTS TO 35 ILL.	)	
ADM. CODE 301, 302, 303 and 304)		

TRANSCRIPT OF PROCEEDINGS held in the above-entitled cause at the James R. Thompson Building, 100 West Randolph Street, Chicago, Illinois, Room 2-025, on the 17th day of February, 2009, at 9:00 a.m.

BEFORE: MARIA E. TIPSORD, HEARING OFFICER,
ILLINOIS POLLUTION CONTROL BOARD
100 West Randolph Street
Suite 11-500
Chicago, Illinois 60601
312-814-4925.

APPEARANCES:

MS. MARIE TIPSORD, Hearing Officer,
MS. ALISA LIU, Environmental Scientist,
MR. ANAND RAO, Senior Environmental Scientist,
MR. G. TANNER GIRARD, Acting Chairman,
MR. SHUNDAR LIN, Board Member,
MS. ANDREA S. MOORE, Board Member,
MR. THOMAS E. JOHNSON, Board Member.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276
217-782-5544
MS. DEBORAH WILLIAMS,
MS. STEPHANIE DIERS,

ENVIRONMENTAL LAW & POLICY CENTER,
35 East Wacker Drive, Suite 1300
Chicago, Illinois 60601-2110
312-795-3707
MS. JESSICA DEXTER;

APPEARANCES (cont'd):

BARNES & THORNBURG, LLP,
One North Wacker Drive
Suite 4400
Chicago, Illinois 60606
312-357-1313
MR. FREDRIC P. ANDES,
appeared on behalf of the Metropolitan Water Reclamation District.

I N D E X

E X H I B I T S

MS. TIPSORD: Good afternoon, everyone. Let's go ahead and go back on the record.

We have with us Adrienne Nemura. And Ms. Nemura's testimony was previously at Exhibit 116.

I will note that you are, therefore, still under oath. And we have some questions that we're going to come back to.

At this point I'm going to start with the IEPA.

ADRIENNE NEMURA,

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

EXAMINATION (Resumed)

BY MS. WILLIAMS:

Q. Good afternoon, Ms. Nemura.

I believe you testified in September that you were not making a specific recommendation to the Board for a wet weather exemption for recreational uses. Is that correct?

A. Correct.

Q. Is it your testimony that the same is true for aquatic life uses?

A. That is true.

Q. I believe you also testified in September that you were not aware of any UAAs in other states that had been completed that allowed for the suspension of aquatic life uses in wet weather. Is that correct?

A. The UAAs that have been done for aquatic life haven't specifically addressed the issue of wet weather. Although wet weather periods may have been included in those UAAs.

Q. Okay.

MS. TIPSORD: Ms. Williams, would it help if I had premarked Question 5 marked?

MS. WILLIAMS: Well, I think she just addressed that.

MS. TIPSORD: Okay.

MS. WILLIAMS: That's why I'm trying to see if -- I think I can skip on to Question 20.

MR. JOHNSON: What number?

MS. WILLIAMS: Twenty.

BY MS. WILLIAMS:

Q. It says on Page 7, Paragraph 3 -- you state, quote, "Several states have modified their water quality standards to reflect challenges associated with attaining uses during wet weather."

Do any states allow for dissolved oxygen levels to fall to zero during wet weather events?

A. Well, there is -- as part of the Chesapeake Bay UAA, there are specific criterion that are -- can be exceeded. And those criterion are one milligram per liter DO as well as 1.7 milligrams per liters DO.

And there are times when the standards allow those criteria to be violated. Whether those periods would include wet weather events or not, isn't specifically addressed.

MR. ANDES: And we can -- we have copies of those standards.

MS. TIPSORD: And I just note for the record that there is, at Exhibit 118, a link to the website on the UAA for the Chesapeake. We referred to it again, I wanted to get in a reference to it.

MR. ANDES: The document is an excerpt from Maryland regulations water quality criteria specific to designated uses 26.0802.03-3.

MS. TIPSORD: And if there is no objection, I will happily, and with all excitement, state that we will enter this as Exhibit 200. Seeing none, that is Exhibit 200.

(WHEREUPON, a certain document was marked Exhibit No. 200 for identification, as of 2/17/09.)

MR. ANDES: I believe we have 201, as well.

MS. TIPSORD: All right.

MR. ANDES: This is a related document, a use attainability analysis for the federal navigation channels located in titled portions of the Patapsco River.

MS. TIPSORD: If there's no objection, we will mark the document just identified as Exhibit 201.

MS. WILLIAMS: I'm not sure -- so this

is from the Chesapeake Bay also? I'm just trying to make sure I understand before --

BY THE WITNESS:

A. The Chesapeake Bay UAA was the regional UAA for the Chesapeake Bay affecting several states. And that document is also used as supporting information for states to do specific UAA, such as the Patapsco.

MS. WILLIAMS: I have no objection.

MS. TIPSORD: With that, we will mark this as Exhibit 201.

(WHEREUPON, a certain document was marked Exhibit No. 201 for identification, as of 2/17/09.)

BY THE WITNESS:

A. And at the end of the Patapsco UAA, it does indicate that Maryland's proposal was that the criteria for the navigation channel could be zero milligrams per liter from June 1 to September 30, inclusive.

BY MS. WILLIAMS:

Q. Can you show me in 200 where the dissolved oxygen standards are you're referring to?

A. If you go to Page 5 of Exhibit 200, under Section 6.

MS. TIPSORD: VI?

THE WITNESS: VI.

BY THE WITNESS:

A. That speaks to -- the adopted standard allows seven percent of the spatial and temporal area in a particular segment for seven percent of that spatial temporal time period, the standard does not apply. So there -- in this example, we have instances where Maryland has adopted criteria lower than EPA's 1986 fresh water criteria.

And they also have acknowledged that those criteria, even though they're lower, can't be met all the time.

BY MS. WILLIAMS:

Q. Can you explain why this section that you identified to us states for dissolved oxygen criteria restoration variance? Can you explain the significance of the term "variance" in that passage?

A. Well, a variance indicates that it's issued for a particular period of time, and it is reassessed along with water quality standards. So the restoration variance indicates that the goal is

to restore this section so that it could meet the proposed criterion and that that will be re-evaluated.

Q. Would you assume that the -- that it would be re-evaluated when the long-term control plan is implemented?

A. This criteria was not -- the UAA was not specifically to address a long-term control plan.

Q. Let's see. Question 31.

"Attachment 4 indicates that elimination of gravity CSO discharges may not result in attainment of a dissolved oxygen standard." And I just want to add the last sentence there. "Does the district believe" -- or do you believe actually -- strike that.

"Do you believe the proposed dissolved oxygen water quality standards would be met when Tarp is completed?"

A. I don't know the answer to that question. In Attachment 4, it was specifically addressing a hypothetical situation with the District's water quality model.

In the Agency's rulemaking, they

acknowledged that these -- the proposed criteria by the Agency may not be met when Tarp is completed.

Q. Can you point to us where it says it may not be met when Tarp is completed, for dissolved oxygen you're talking about.

A. On Page 61, it discusses -- "The Agency's testimony discusses that you do have violations of the secondary contact on indigenous aquatic life, due to the combined overflow impacts. The Agency indicates, similarly, at least until the Tarp is completed, it is highly likely the proposed dissolved objection standards will be violated. It may be necessary for MWRDGC to implement additional flow augmentation aeration treatment technologies in order to achieve compliance with these dissolved oxygen standards."

Q. Does that sentence express an opinion on what the status will be after Tarp is completed?

A. It does not. But there's no indication that it will be met.

Q. There's no indication that what?

A. That the DO criteria will be met.

Q. In the Agency's?

A. Correct.

Q. But what about in your opinion?

A. In my opinion, because you have continuing wet weather problems that will occur, such as tributary runoff, storm water runoff, you still will have some CSO events and pump station discharges. In my opinion, you may not be able to meet the proposed dissolved oxygen criteria when you have wet weather loads within the Chicago area waterways, because of the unique nature of the system.

MR. ANDES: I think it will help if we pass out copies of -- this was Figure 5 in Attachment 4, what she's referring to.

BY MS. WILLIAMS:

Q. I don't think it's what you're referring to; is it? Because we're talking about -- oh, I see.

Explain to me why you would say this is what you're referring to now?

MS. TIPSORD: Wait a minute. Let's be clear. This is Figure 5 to Attachment 4 of Ms. Nemura's Exhibit 116 of her prefiled testimony; correct?

MR. ANDES: Yes.

BY THE WITNESS:

A. This figure is relevant. It is a chart produced with the District's water quality model, which is the best available tool for evaluating, so to speak, what-if scenarios. What if we could control CFOs.

In this example, the dissolved oxygen that is calculated by the model for Halsted Street on the south branch of the Chicago River -- so that's just upstream of Bubbly Creek. It shows the dissolved oxygen concentrations over two wet weather events, July 24th through August 9th of 2001. Those were the conditions simulated with the model.

The blue line shows the calibration of the model based on current conditions. The dashed line shows the hypothetical effect of -- if you could all of a sudden eliminate all of the gravity CSOs.

And what I mean by gravity CSO is, there's over 200 locations of CSO outfalls that are represented in the model. When the District's interceptors fill up with runoff from rainfall events, as they're designed to do, those individual

pipes going out to the river, they can't divert the storm water and the sewage into the interceptor, so it flows out by gravity to the Chicago area waterways.

MR. ANDES: So when you talk -- to clarify. When you talk about the gravity CSOs, it's the two main components of the old CSO system or the pump stations, like Racine Avenue -- enormous pump stations with a lot of flow -- and then several hundred individual CSO outfalls; correct?

THE WITNESS: Correct.

MR. ANDES: And you're talking about a scenario where you would eliminate every one of the several hundred individual CSO outfalls?

THE WITNESS: Right.

BY MS. WILLIAMS:

Q. But, Ms. Nemura, I guess what I'm getting at is, does this chart reflect the modeling that would happen without gravity CSOs? But it doesn't -- it's not just gravity CSOs that Tarp is designed to address; is it?

Isn't Tarp also going to address

the pump station discharges?

A. I'm not familiar with the specifics of the District's Tarp program.

MR. ANDES: Is your understanding that Tarp will eliminate 100 percent of the gravity CSOs?

THE WITNESS: No.

MR. ANDES: So this hypothetical is actually very conservative, in terms of assuming that, let's see what would happen if we eliminated every single one of those several hundred CSO outfalls.

THE WITNESS: Correct.

So you can see that the dash line where that simulation was run, there will be some wet weather events, even if you could eliminate the CSO discharges where you would still violate the criteria.

BY MS. WILLIAMS:

Q. In the hypothetical scenarios that you eliminate gravity CSOs, but not the huge volume from the pump station discharges; correct?

A. Correct.

Q. Question 32 presents a quote from

Page 5, Paragraph 3 of your testimony. Quote, "These data show that dissolved oxygen can get very low, zero to two milligrams per liter at time. And even -- in the last several days to a week at a time."

And the crux of this question is would this result in fish killing?

A. Associated with CSOs?

Q. Correct.

A. I'm not aware of any. And Dr. Dennison has testified that under current conditions we -- the Chicago area waterways do experience low levels of DO. And that there have not been observed fish kills.

MS. WILLIAMS: I don't have anything else for this witness. Thank you.

MR. ANDES: I have a --

MS. TIPSORD: I was just going to the environmental law policies, if you have some follow-ups, go ahead.

MR. ANDES: Ms. Nemura, I want to follow up.

If you were to develop wet weather water quality water standards for aquatic

life, how would you go about doing that?

THE WITNESS: First, I would obtain the result of the District's habitat studies to assess the species of fish that any proposed revision to the standards would be trying to protect. Such as was done with the Chesapeake Bay program.

Then, I would use research that had been conducted in the laboratory and potentially supplement that with research in the field to identify what types -- what magnitude, frequency and duration of low DO could those species be exposed to from an acute prospective, meaning they wouldn't die, such as in a fish kill, but also from the chronic perspective, where their growth and reproduction may be affected. And in that research, that has already been conducted, there's information that suggests that different species are able to tolerate very low levels of dissolved oxygen, less than, say, .7 milligram per liter, for a short period of time.

And the research also supports

that different species of fish can detect and avoid low dissolved oxygen conditions. So in a situation like the Chicago area waterways, where you have a load of oxygen-demanding material coming out, say, from a CSO, that will cause the dissolved oxygen to drop in the waterways and then it will -- that area of low DO water will move downstream and be supplemented with higher DO water from upstream.

So in the District's testimony, where they speak to the fact that fish may be able to avoid those low DO pockets, supplement that with the research that suggests that certain species can not only avoid those low DO pockets by, say, going up to the surface or moving up to the side. But they can also, at times, be exposed to those low DO pockets and not suffer either death or growth and reproductive problems.

And that could be used -- that information could be used to develop site-specific criteria that would be protective of the species that you're trying

to protect.

MR. ANDES: And we have two reports that Ms. Nemura is referring to. The first one is Behavioral Response of Fish Larvae to Low Dissolved Oxygen Concentrations in a Stratified Water Colony.

MS. TIPSORD: And that article is by D.L. Wreitburg, from Marine Biology 1994.

If there's no objection, we will enter this as Exhibit 202. Seeing none, it's Exhibit 202.

(WHEREUPON, a certain document was marked Exhibit No. 202 for identification, as of 2/17/09.)

MR. ANDES: The second report, titled The Influence of Fish Size on the Avoidance of Hypoxia and Oxygen Selection by Large Mouth Bass.

MS. TIPSORD: And this is from the Journal of Fish Biology 2001. If there's objection, we will mark this as Exhibit 203.

Seeing none, it's Exhibit 203.

(WHEREUPON, a certain document was marked Exhibit No. 203 for identification, as of 2/17/09.)

BY MS. WILLIAMS:

Q. So, Ms. Nemura, can you tell us whether this Exhibit 202 addresses Channel Catfish or Large Mouth Bass?

A. They do address Large Mouth Bass.

Q. And 202?

MR. ANDES: Can we take a copy back of 202? Do you have an extra?

MS. TIPSORD: Actually, yes. There's some right there.

BY THE WITNESS:

A. No, I'm sorry, Exhibit 202 provides references that do discuss the phenomenon that I was talking about. And I don't know whether those specific references would -- the studies included the Large Mouth Bass.

Exhibit 202 is related to two species, the Naked Goby and the Bay Anchovy. And it specifically addressed larvae, which are sensitive, as well as the adult Naked Gobies that could

tolerate .7 milligrams per liter DO for seven hours or less.

BY MS. WILLIAMS:

Q. Do we have the entire document in front of us?

A. It appears that that is not the entire document. But we can make that available.

MR. ANDES: We can certainly provide the entire document if that -- people want to read it.

BY THE WITNESS:

A. But the gist of this study is you have a dissolved oxygen gradient. And the question was whether the low DO that are present in those gradients could be tolerated by fish.

BY MS. WILLIAMS:

Q. Would you agree, Ms. Nemura, that once you determine -- well, first of all, how would you determine the list of potential fish species that you'd be looking at under the methodology that you just described?

A. How would I determine it?

Q. Uh-huh.

A. You would look at the -- as part of

the habitat study the District is conducting, they are gaining information on the species of fish that are present in the Chicago area waterways. You can also evaluate the habitat that is available to determine whether the habitat is suitable for the propagation of the resident fish species, as well as other species biologists may feel could reside within that habitat.

Q. Would you agree that once you've done that analysis, the dissolved oxygen criteria you'd developed would need to protect the most sensitive of the species you're trying to protect?

A. You would need to evaluate all of the stressors that affect the fish.

Just, for example, let's say we were able to aerate the entire Chicago area waterways and have it be 12 milligrams per liter of DO all the time. Whether or not you would see a change in the fish assemblage is a big question, because there are other stressors that would affect whether fish would actually start appearing in different segments.

Q. But I don't think that's -- that wasn't the question; right? I mean, you are

saying that first you determine which fish could live there, then you need to determine what dissolved oxygen you need to protect them; correct?

A. Right.

But your question to me was how would I go about determining what fish would live there, which is what I was trying to speak to.

Q. So you're flipping it around.

You're saying if we made the dissolved oxygen as high as possible, what fish could live there. Is that how you look at it?

A. No, I was saying that when -- your question to me was -- if I understood it correctly, was how would I determine what species of fish should be protected for, and would I protect for the most sensitive species. And what I'm saying is that question has a whole lot to do with a lot of other factors than specifically dissolved oxygen.

So my hypothetical example of, just because the Agency would pick a dissolved oxygen number, doesn't necessarily mean you would actually achieve any better fish population than what you have today.

Q. Right.

A. Because of these other stressors.

Q. Right.

A. So your question was more complicated than...

Q. But -- well, I don't -- I guess I don't know -- I think you're presenting the analysis in the way I would agree it should be done. First you determine what habitat is there, support -- and what fish live there and what is the attainable aquatic life use population; correct? That's the first step of the analysis.

It may be complex, it may have different levels, but that's first what you do?

A. Right. What is the highest attainable use.

Q. Once you've determined that, you have to adopt criteria to protect that use; correct?

A. Correct.

Q. Do you disagree that the process for determining the criteria would involve what dissolved oxygen level is necessary to protect the most sensitive species that you're protecting for?

A. Which you would have determined through --

Q. Which we have already determined, already settled?

A. Yes.

Q. You agree?

A. Yes.

Q. I think that's all I was trying to get at, thank you.

MS. TIPSORD: Any additional follow-up, Mr. Andes?

MR. ANDES: No.

MS. TIPSORD: Dr. Lin has a question.

DR. LIN: You talk about fish species important to DO. How about the nitrate content in fish -- is very important for fish species. Do you consider this problem?

MR. ANDES: Are you talking about nitrate or nitrogen?

MR. LIN: Nitrate and nitrogen, same thing.

THE WITNESS: Okay. You would also need to look at appropriate ammonia and nitrogen criteria, because there can be toxicity with that.

On the general question of

nutrients, of which nitrate is A nutrient, that -- that affects the productivity of the system. And, typically, what you would want to do is ensure that the level of algae that you have in a system, as well as the level of para Phiten and plant growth, that your nutrient levels were in balance with your desired food that is -- needs to be present in the system.

And that you would look at the whole sort of food web within the Chicago area waterways to determine what the appropriate nutrient levels should be. And part of that food web analysis includes the type of fish and bugs that you want to have in that system.

Did I answer your question?

MS. DEXTER: Jessica Dexter with the Environmental Law & Policy Center.

BY MS. DEXTER:

Q. I only have two questions for you. The first one I think sort of wraps up what you were saying a few minutes ago.

"Do you believe that wet weather

standards should be adopted that would allow DO levels to include indigenous aquatic life from living in areas of the CAWS during wet weather events?"

MS. TIPSORD: This is the prefiled Question No. 5.

BY MS. DEXTER:

Q. Prefiled Question No. 5.

BY THE WITNESS:

A. Well, it goes back to if the Agency is going to adopt uses and criteria for the Chicago area waterways, they should be attainable. And I'm not suggesting that the Agency adopt standards that would allow fish kills or would prevent fish from living there.

But what I am saying is that you have a system that is affected by wet weather discharges. And that system will continue to be affected by wet weather discharges.

So you need to -- in evaluating what the uses and the criteria should be, you have to account for the fact that those wet weather discharges are going to impact conditions within the waterways, specifically with respect to the

dissolved oxygen.

Q. My prefiled Question 7 is, "Does the District have actual DO measurements taken during summer 2001 at the sites, which you have modeled, that can be shown on the plots of Figures 2 through 9 in Attachment 4 of your prefiled testimony, which is, I believe, Exhibit 116?"

A. In that exhibit -- let me clarify that it was the District that ran these model simulations, not me. And I'm not saying that this is exactly what would happen in 2001.

Because it is a model, and it is used to evaluate the what-if scenarios that you cannot do with data alone. The data measure what's going on in the system at the time it was measured.

There are continuous monitors the District operates that were operating in 2001, that during the same periods that were simulated -- the District simulated with the model. But what you're trying to do with the model is say what would happen if we can eliminate the gravity CSOs?

What could happen if we control the other sources of wet weather loads? So overlaying the data wouldn't tell you that answer.

Q. Okay.

MS. DEXTER: That's all I have.

MS. TIPSORD: Anything further for Ms. Nemura?

Thank you very much for coming back.

(WHEREUPON, the witness was excused.)

MS. TIPSORD: That takes us to Mr. Freedman.

(WHEREUPON, the witness was duly sworn.)

MR. ANDES: Here is a copy of his testimony.

MS. TIPSORD: And if there's no objection, we will mark Mr. Freedman's prefiled testimony as Attachment to Exhibit 204. Seeing none, it's Exhibit 204.

(WHEREUPON, a certain document was marked Exhibit No. 204 for identification, as of 2/17/09.)

MS. TIPSORD: And whenever you're ready, Ms. Williams.

PAUL L. FREEDMAN,

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

EXAMINATION

BY MS. DIERS:

Q. I will be asking questions on behalf of the Illinois EPA. I'm going to begin with Question 3 of our prefiled questions.

And the question states, "What study should the Board weigh on to assist with establishing aquatic life uses for CAWS?"

A. I believe I outlined those studies in both my testimony and the attached report in my testimony on Pages 12 and 13, I outlined them. And in it, I highlighted numerous deficiencies.

So it was any opinion that the EPA proposal lacked certain information that could be resolved by data from scientific and engineering studies that are ongoing. The Board spent considerable time with Dr. Mackey talking about some of those deficiencies.

And I listed a number of studies in addition to the ones Dr. Mackey referred to. Included in them was the Habitat and Biological

assessment study that you spent a lot of time in your question and answer, as well as some additional dissolved oxygen modeling, water quality monitoring that's ongoing, the development of an integrated water quality strategy that looks at the implication of a number of different activities, field tests on the SEPA stations, economic environmental impacts and hydraulic modeling. And you just spoke with Dr. Garcia this morning on those.

And it's that collection of studies that I was speaking to that I felt it was in the best interest of the state and the best interest of the EPA to await this large compendium of new information and use it to develop the standards.

Q. And what studies are you specifically involved in?

A. My company is involved in conducting the habitat study, although I can't say that I'm specifically involved in the day-to-day activities on that. But -- and we have, shall we say, coordinated a little bit with the District on some of the dissolved oxygen modeling.

And -- but the only study that has direct involvement through my company is the habitat

study.

Q. And that's Limno-tech; correct?

A. That's Limno-tech in particular.

Oh, I -- I want to append. There's also the integrated water quality strategy, excuse me. And we are involved in that as a subcontractor to an engineering firm that's working for the District.

Q. Which firm is that?

A. CTE, now known as AE Comp.

Q. With respect to the Habitat and Biological Assessment Study, do you know, were habitat microinvertebrates, fish sediment and water quality data considered in the CAWS UAA?

A. I'm sorry, was your question --

Q. I think what -- quoting, "We're looking at the Habitat Biological Assessment Study" -- just a second.

Okay. Based on what you've stated on Page 12, the Habitat Biological Assessment Study will provide more comprehensive data.

Do you know what habitat microinvertebrates, fish sediment and water quality data considered in the CAWS UAA?

A. As I understand your question, you're asking me if they considered habitat and considered biologic -- the biologic in the UAA?

Q. Yes.

A. Yes, I -- they did consider it. But my opinion was that the information was insufficient, and that it would be in the best interest of the state to consider that information and do a more comprehensive and scientifically thorough development of the standards.

And the Habitat and Biological Assessment Study that is now currently underway, provides a lot of that needed information.

Q. Okay. Prefiled Question 4.

"Are you suggesting in your prefiled testimony that the general use daily minimum and seven-day minima for the CAWS is unwarranted? If yes, please explain."

A. I guess you'll have to say -- I'll have to ask you what you mean by "unwarranted," because that was not my terminology. If you mean unjustified, I would agree.

Because I said it was unjustified and premature. I expressed in numerous places in my

testimony, as I think the other experts have, that the system is truly unique, has limited biologic potential and has the need for very site-specific water quality standard, which is not just an easy and arbitrary, shall we say, plucking a number out of the general use standards and sticking it into the CAWS.

And it is my opinion that the IEPA failed to define those biologic conditions specific enough and then match those specific -- that specific definition with a specific criteria that would be attainable. And that was the -- so, my opinion -- I did not use the term "unwarranted," I was speaking whether it was justified and whether it was premature, and I stand by that opinion.

Q. I'm going to go to Question 6.

"What dissolved oxygen standard would you propose" -- I'm going to change it just a little bit and say, what dissolved oxygen standard would you propose for the CAWS? Do you use A waters?

A. Well, I did not propose this specific standard in my testimony to be candid, I thought that was the role of IEPA to propose the standards

and to justify it. And my feeling was that you were not thorough enough in the justification.

My testimony focused on the deficiencies in that justification. And that -- and I did not propose a specific number.

Again, I think that in order to support a specific number, you need more information of those studies that are, as we speak today, ongoing.

Q. So once you complete the habitat study, would you be in position to propose a standard for these waters?

A. Well, yes and no. I believe that's one piece.

But in developing a dissolved oxygen standard for a waterway, there's multiple pieces that one has to get all aligned when you do a UAA. Because in the Use Attainability Analysis, you need to not only look at what the suitable habitat is, what the ambient species are, as Mr. Lin pointed out, what the other chemical constituents are.

You also need to look at what is actually attainable in terms of the water quality criteria. Because, hence, the use of the term "Use

Attainability Analysis," is what use and what criteria can actually attain.

So in partial answer to your question, yes, once the habitat study is completed, you will begin to have the foundation for how to put this, shall we say, puzzle all together. Put all those pieces together to define both the use and the criterion.

Q. Question 7.

"What are the significant impacts you are referring to on Page 4 of the prefiled testimony?"

MR. ANDES: Do you mean significant impact?

BY THE WITNESS:

A. I think you're quoting?

BY MS. DEXTER:

Q. Yes.

A. I guess I would refer you to Pages 4 and 5 of my testimony, as well as Pages 3 and 4 of my report. And there I draw from the research of others.

I talk about loss of habitat, flow variations, which is the loss of habitat Dr. Mackey

talked about before. The flow variations Dr. Garcia was talking about this morning and water level fluctuations, stagnation and stratification, all of those were talked about this morning.

High solids and resuspension, low dissolved oxygen. I can read for you an excerpt from my testimony, if that helps, which highlights -- relates directly back to the statement and it follows that.

If you'd like me to read for the record. "The differences highlighted above have a significant impact on attainable uses and water quality and the affected waterways. The available literature is replete with recognition of how altered conditions impact water quality and potential biologic uses.

"For example, as described in my report, the Army Corp of Engineers describes navigation channels as having altered flow, limited mixing and stratification and sediment effects that all can lead to low dissolved oxygen and unstable bottom substrate. USEPA also states the physical and hydrologic characteristics of manmade water bodies are not conducive to the establishment of a

balanced population of aquatic biota.

"Many other scientific publications document the negative ecological effects of navigation on manmade channels, including some mortality of fish eggs, larvae and adult fish, prevention of effective spawning and severe limitations and growth and development of fish larvae and young and Deer Fish."

And those were the impacts that I was referring to, as described in that discussion in my testimony.

Q. Are you saying one needs to do a UAA on a criteria?

A. A UAA is a use attainability study, which is designed to, again, determine the attainable uses. And attainable uses, as I think I said before, involves a collection of considerations.

And you have to look at not only habitat and biologic species, but you have to look at how the six UAA factors, those alterations in the system, might affect what the potential is for water quality conditions. And so, part of the process is to look at whether any proposed criteria is

attainable.

Q. Where does it say that, what you just stated? Where would I find that at?

A. I guess I don't have the UAA guidance here, but it would seem it would be common sense if you're looking at an attainability analysis that you would have to -- it would be kind of foolish for the state to propose a specific use and a specific criteria that couldn't realistically be attained.

BY MS. WILLIAMS:

Q. Mr. Freedman, I'd like to follow up here just for a second, because I think this is along the line of what I was just asking Mr. Nemura about.

My understanding is you do a UAA by first determining which uses are attainable; correct?

A. Yes. But uses, as I said, if you don't have adequate -- if you can't attain a certain water quality condition, how can you possibly say that that use is attainable?

Q. But you can't point to anywhere in the USEPA guidance where it directs you to look at whether a criteria is attainable?

A. I guess I don't have the specific guidance here in front of me to --

MR. ANDES: Are you intending that the use has to be attainable but the criterion doesn't?

BY MS. WILLIAMS:

Q. I believe we established with Ms. Nemura's testimony that once you do a use attainability, then -- and I'm just asking if you agree with this statement. Once you determine which uses can be attained, therefore must be protected, isn't it correct that you develop criteria to protect those uses? Is that correct?

A. And my opinion was that in order to define the attainable uses, that you have to look at all the different stressors on the system, which includes biology, it includes habitat, it includes flow and it includes water quality. Now, that's not to say that you necessarily look at the existing water quality, because there could be higher levels of water quality that you might want to set as the criteria.

But you need to look at what is feasible in terms of attainment. And the UAA

guidance outlines six different factors that might prevent that attainment, including altered conditions, the kind of things that -- dams, flow modifications, navigation kinds of things that are present in the CAWS.

MR. ANDES: So if I can follow up on that, just to clarify.

Are you saying that once you set attainable uses, the criteria need to be set to protect those attainable uses? Is that correct?

THE WITNESS: As long as your attainable uses have considered all the different stressors, yes.

MR. ANDES: So if you set uses properly, and, say, you've decided that the water was limited use of some sort, but then you set a criterion that was based on higher than limited use, would that be improper under of the Clean Water Act?

THE WITNESS: That would be inconsistent, that's correct.

MR. ANDES: Is that what you're saying they're doing here?

THE WITNESS: That is my contention here, that they have set -- that they haven't evaluated whether the criteria effectively matched the actual uses.

MR. ANDES: Thank you.

MS. DEXTER: I'd just like to note that there are some legal opinions getting mixed in with the scientific opinions here that the witness is giving. And to the extent he's giving legal opinions, I don't think he's qualified to give a legal opinion about what the Clean Water Act requires.

I just wanted to note that.

MS. TIPSORD: It's noted. But I would note that he was sort of asked the question.

BY MS. DIERS:

Q. Prefiled Question No. 9.

"What do you deem as significant effects in the CAWS due to wet weather impacts?"

And I think this is referring to your statement on Page 5, the last paragraph.

A. Yeah, I think on Page 5, in my testimony, I thought it was rather clear. I can excerpt from it again.

Q. Well, why don't you, since I asked the question, please.

A. "The CAWS has unique hydrologic and hydraulic dynamics impacted by wet weather and flow management. In anticipation of a major rain event, the water level in the CAWS is rapidly lowered by a controlled release of water at the Lockport Powerhouse to accommodate overflows from large storms and avoid overbank flooding.

"In response to a storm, the CAWS can receive enormous inputs of storm water, CSO and pump station wet weather flows. This can result in a significant pollutant load and dramatic rise and fall of water levels with extreme changes in flow.

"These rapid fluctuations and flow in the CAWS can result in substrate scouring, sediment resuspension throughout the water column, dry and platoral aquatic habitats and a sudden decrease in dissolved oxygen below the standard."

And those were the impacts that I described. I think those were discussed about in Dr. Melching's testimony, and I believe it was also addressed in other testimonies.

Q. Do you think a wet weather standard is

needed for these waters?

MR. ANDES: I'm sorry, what was the --

MS. DIERS: I asked him if he thought a wet weather standard was needed for these waters.

BY THE WITNESS:

A. It's my opinion that a provision for wet weather conditions would be appropriate in the CAWS, because of the unique wet weather management in the system. And that it -- it needs special consideration, and part of -- yes, I do.

BY MS. DIERS:

Q. And how would you envision that wet weather standard for these waters?

A. I guess I haven't specifically proposed a specific numerical criteria. But I -- in terms of the attainability of a water quality standard being a use and a criteria, I think it was the responsibility of IEPA to consider the effects of wet weather and evaluate what would be the appropriate provisions that would be matched with the highest attainable use in the system.

MR. ANDES: And would you agree with the statements set forth earlier by

Ms. Nemura of how to set a wet weather standard?

THE WITNESS: I would concur with her comments.

BY MS. DIERS:

Q. Is the habitat study that you're involved in, would it help one work on a proposal for a wet weather standard?

A. It's a foundation, but, in the case of wet weather, there's many other complicating factors that aren't specifically addressed in the habitat study.

Q. And what are those complicated factors?

A. I think I detailed them before, the rising and lowering of flow, the existance of storm water loads, what might be happening with combined sewer overflows and pump stations, scour and sediment deposition as a result of changes in flow and the stagnation conditions. I think you'd have to consider all those factors when considering a wet weather provision.

Q. Prefiled Question 12.

"In your prefiled testimony on

Page 11, in the last sentence you state that Illinois EPA has not provided an adequate demonstration that the proposed aquatic life use can be achieved. In the second paragraph on Page 12 of Attachment 2 to your prefiled testimony, this concern is reiterated in the statement that Illinois EPA did not show that proposed beneficial uses can be attained in the foreseeable future."

The first question, "Have you performed an analysis that proves their states show that the aquatic life uses proposed by Illinois EPA cannot be obtained in the waters for which they have been proposed. If yes, what biological physical and chemical information did you use and how did you interpret it to arrive at your conclusion?"

A. Did you want to read the rest of the question?

Q. I can if you want.

"On what basis do you conclude the aquatic life uses proposed by Illinois EPA cannot possibly be attained in the waters for which they've been proposed?"

A. The answer to the question is no, that I have not performed any independent measurements

and analysis of the attainability. And I guess, in my view, I felt that it was the responsibility of IEPA to provide the demonstration that the uses are attainable, not the responsibility for me to prove that they're not attainable.

But I would also contend that in the supporting material to -- from that -- from IEPA, that they provide some information that shows that they either did not demonstrate that attainability or that it would not be attained. For example, they talk about protection of early life stages as one of their criteria, yet there was no evidence that they collected any data on early life stages.

They also have other statements that the DO criteria will not be met without supplemental programs of aeration and flow augmentation. And that, even then, that the improvements in the fish community that they're proposing and wanting to support, might not be attained without habitat improvements. And the habitat improvements, as was outlined in the UAA, were unplanned and no one has any plan or provision for them.

So there was a number of things in there, a number of what I would call red flags that said, well, wait a second, where is the IEPA's evidence that these uses can be attained. And my feeling was that that evidence was not there, in fact there was some contradictory efforts.

Q. Question 13. "On Page 13 in the first paragraph of your conclusions of your prefiled testimony, do you recommend that the Illinois Pollution Control Board establish a separate use classification for Bubbly Creek, i.e., the south fork of the south branch Chicago River, that differs from the proposal by Illinois EPA?

"Additionally, you recommend that the Board does designate Illinois EPA's proposed Use B rather than Use A for Cal Sag Channel. Have you performed a scientific investigation to arrive at these recommended use designations? A, if yes, on what biological, physical and chemical information interpretation is that analysis based? B, if no, how did you determine that the biological potential of the south fork of the south branch of the Chicago River is less than the biological potential represented by Illinois EPA proposed aquatic life

use for this water?"

A. I guess this is somewhat related to a previous question that was asked, and I would resay again that no, I didn't conduct any independent rigorous scientific measurements to demonstrate that.

Again, my contention is that the role of the IEPA in proposing certain new uses and standards to provide the scientific justification, and that there is some evidence in their limited information they have that suggests otherwise.

MR. ANDES: If I can follow up.

Can you explain more about your thought process on this issue, these water bodies?

THE WITNESS: Well, just as an example. For instance, if you're talking about the Cal Sag. And one of the defining characteristics in the Cal Sag was for -- I'm sorry, for Class B characterization.

Class B waters was, you know, a deep draft steep walled channels. Yet in the actual descriptions that were in the documentation provided IEPA, they described

the Cal Sag as having steep solid walls. You know, it sounds awful similar to me.

And as another example, I think we spent a lot of time on Bubbly Creek about its unique conditions and stagnation and stratification with Dr. Melching, and Dr. Garcia. And even Dr. Dennison's discussion.

And the -- so the conditions in Bubbly Creek are unique, even within the context of the uniqueness of the CAWS. But, furthermore, I found it quite surprising that in that very specialized unique area, that the IEPA had no data on the Bubbly Creek to demonstrate how it would fit in any of the use classifications.

So it was my conclusion that the IEPA had failed in their ability to provide the necessary scientific justification.

BY MS. DIERS:

Q. Question 16.

"How did you term that the biological potential of the Calumet Sag Channel is less than the biological potential represented by

Illinois EPA's proposed aquatic life use for this water?

MR. ANDES: I think he just answered that.

BY THE WITNESS:

A. I think I spoke to that already.

Just as one example, the steep solid walls was kind of one of the -- if you compare the wording, how they characterize A and B, they -- there's two defining things. One is whether it's tolerant or intermediately tolerant to organisms. And the other was the description of deep grafts, deep walls.

And in the IEPA's own supporting information, they call it steep solid walls. I mean, I may not be a Ph.D. biologist, but I am an engineer, and I know what deep -- you know, steep solid walls are. And common sense would say that it would fall in line with that.

There was other evidence that's been introduced by other experts talking about biologic conditions and habitat, and I think the other experts were better capable of speaking to those issues. And they spoke to this matter at

length before the Board.

Q. Did the UAA also indicate that the Cal Sag Channel had shallow shoreline areas?

A. In some areas. But I think that was a major shortcoming of the IEPA study and something that would be improved on by the current habitat study. That if you're doing a large generalization of a water body, you know, miles and miles of reaches, you need to do a more comprehensive characterization of the system and be able to say that just because you have some areas that might be shallow, you also -- they describe it as steep solid walls.

So, you know, which is it? And without a comprehensive characterization and comprehensive habitat study, looking at not only the shape but also the sediment conditions, it would be difficult to make the proper scientific classification, which is, again, returning to -- I hate to return to my theme, but it's the -- it's -- a major thrust of my testimony is that it would be in the best interest of the state to wait for these other studies and then we'll have a comprehensive, scientific and thorough assessment of the habitat

along the whole length of the Cal Sag, as well as all areas of the CAWS.

MR. ANDES: If I can follow up, have you -- did you also review and agree with Dr. Makke's statements indicating that during his testimony that there might be limited areas of refuge but not for spawning?

BY THE WITNESS:

A. I reviewed his testimony. But, you know, not being, again, a, quote, "biologic expert," I would concur with his conclusions.

But I haven't viewed all the habitat data, as Dr. Mackey did. And so I would rely on his testimony.

BY MS. DEXTER:

Q. Dr. Mackey is not a biologist; correct?

A. He's a habitat specialist. I guess I'm not here to speak through -- to his --

MR. ANDES: I don't think he's an expert on Dr. Mackey.

BY MS. DIERS:

Q. Are you a Biologist?

A. No, I'm not.

Q. Question 18.

"In the first sentence of Page 4 of the prefiled testimony, and again in the second paragraph on Page 2 of Attachment 2 to your prefiled testimony, you state that the Chicago area waterway system is unique with no other comparable system in Illinois or in the entire United States. Do you believe that no other water body in the United States has the same potential level of biological condition as the CAWS? If yes, what defines these unique levels of" -- and I'm going to add potential biological condition in the question there, because it wasn't worded very good.

A. There may very well be systems with similar biologic potential. I'm willing to concede that that might be a possibility.

But what my contention was is that I do not feel that IEPA made the necessary assessment to evaluate these potential comparables. Based on my 35 years of experience, I would have to say that the CAWS is unique in its combination of factors.

Yes, you could take any individual factor and you could say that factor existed in

other systems, but when you look at the whole compendium of them, that there's no system that I'm aware of that has all of these in one setting. Manmade or severely altered redirection of flow, reversal of flow, channelization, deep walls, contrived, nonnatural hydraulics with emptying and filling, flow regulated, lack of shallows and ripples, sedimentation, flow reversals, effluent dominated, CSOs, pump stations, barge traffic, you know, stratification, when you take this combination, it's -- it's very unique.

And whether there are comparable or not, I guess again I'd return whether if -- if IEPA says it's unique, then I don't feel that they've developed really unique site specific. If they feel it's comparable to some other systems, then I would contend that they failed to look at other similar systems, as I pointed out in any testimony and say, well, might this apply here.

So, either way, I feel that the IEPA was deficient. Either they didn't develop the site-specific criteria for this unique setting or they failed to look at other possible applications as a comparable.

Q. Question 19.

"Of the states that have aquatic life uses based on a concept of a tiered aquatic life uses approach, do you know if any aquatic life uses that are defined by those -- that particular species or taxa of aquatic organisms. And, if so, can you provide some examples?"

A. Yes, I would say that Ohio, Texas and Maine both have adopted tiered aquatic uses, and they have used a biological conditioning gradient that's combined by a particular taxa. And there's a number of other states that are in the drafting stage and have not been approved yet, but Connecticut, New Jersey, California, Minnesota.

It's kind of becoming the standard of practice in the field. Although it's not yet a promulgated procedure, it's kind of the growing conventional scientific approach to this issue.

MR. ANDES: If I can follow up on that.

Can you provide an example of a state developing site-specific standards based on a list of species -- particularly species that are present in that water body?

THE WITNESS: I guess I would repeat, Maine is certainly an example, where they've done the tired aquatic uses.

MR. ANDES: And if I can stop you there.

I believe we have some information about the Maine approach from the IEPA draft guidance.

THE WITNESS: Yes. So if we could enter that...

MR. ANDES: These are selected pages, 32 to 37, from a draft EPA document entitled Use of Biological Information to Better Define Designated Aquatic Life Uses in State and Tribal Water Quality Standards: Tier Aquatic Life Uses.

MS. TIPSORD: We will mark this draft USEPA document as Exhibit 205, if there's no objection.

Seeing none, it's Exhibit 205.

(WHEREUPON, a certain document was marked Exhibit No. 205 for identification, as of 2/17/09.)

MS. TIPSORD: Thank you, Mr. Freedman, go ahead.

THE WITNESS: I'd also like to point to a specific case study in Colorado for the South Platte River, where the state there looked at the individual species and actually did testing of those native species that resided in the water body and looked at their tolerance. So it related -- it looked at the unique characteristics of the South Platte, it identified the species that were there, it took the resident species, which were adapted to those conditions, tested them for their DO tolerance and developed specific DO criteria for the conditions in the Platte -- subPlatte.

And given the -- that being kind of a fairly unique system, given the unique nature of the CAWS, it could be a very comparable approach. Not saying comparable standard, mind you, criteria, but comparable approach that could be used here.

MR. ANDES: The two documents we have regarding the Upper South Platte, one is the

actual water quality standards. The document is entitled Upper South Platte River Segment 15 Site-specific Minimum Dissolved Oxygen Ammonia Standards.

MS. TIPSORD: And if there's no objection, we will mark the Upper South Platte River standards as Exhibit 206.

Seeing none, it's Exhibit 206.

(WHEREUPON, a certain document was marked Exhibit No. 206 for identification, as of 2/17/09.)

MR. ANDES: This is an excerpt from a technical report concerning the Upper South Platte. The title is Final Technical Memorandum Responses Seven Fish Species to Diel Fluctuations in Dissolved Oxygen.

MS. TIPSORD: If there's no objection, we will mark this as Exhibit 207. It's the -- it's prepared for the Metro Wastewater Reclamation District, Denver, Colorado, by the University of Wyoming.

MS. WILLIAMS: I mean, I don't -- I guess I'll object. I mean, I don't want to

be difficult, but this is just a table of contents, and a one-page introduction to this document. I don't understand for what purpose it's being offered.

MR. ANDES: Just a moment.

I would say that, actually, there were pages that were supposed to be copied that were not.

MS. WILLIAMS: Well, we'll withdraw it at this time then and present it later?

MR. ANDES: We can certainly file the full set of pages that were to be done.

MS. WILLIAMS: I don't think that's reasonable, because I don't think we can -- we can't cross-examine this witness on a document that's not here to look at; right? I don't think that's reasonable.

MR. ANDES: Mr. Freedman can certainly testify as to the water quality standard and his understanding for the basis for it.

MS. TIPSORD: We're going to hold off. We will not mark this as Exhibit 207. We will hold off, and when you get the complete document, we can put it in.

MR. ANDES: Surely.

MS. TIPSORD: But Exhibit 206, which is the introduction of the standard, we're leaving.

THE WITNESS: Then maybe I could speak to the one document that has been entered. This is the Upper South Platte River Segment 15 Site-specific Minimum Do and Ammonia Standard has been entered?

MS. TIPSORD: Yes.

THE WITNESS: And I was asked if there were other examples, and I would contend that this is an example where they did use site-specific species. I think I characterized how they went about the study.

And I'd also like to point out that they did it by segment. You'll notice this has Segment 15.

You'll also notice that they have some quite low DO criteria that were developed for that specific segment and those specific native fish. And those criteria are lower than what's proposed in the CAWS.

Again, I'm not proposing these

criteria for the CAWS, I'm just illustrating the kind of process that one would go through to do this and how one might come up with different criteria than what are in other more general use waters.

BY MS. DEXTER:

Q. Have these standards been adopted in Colorado? I don't see a citation on here.

A. Yes, they are adopted. We can get you the actual citation.

Q. Okay.

A. So we'll get the more complete documentation and the citation.

MR. ANDES: Sure. That is a page taken directly for the Ohio regulations online -- Colorado, excuse me.

MS. DEXTER: I just don't see a site here.

MR. ANDES: They don't site numerically, unfortunately, in the Colorado regulations.

BY MS. DIERS:

Q. Question 25.

"For the Cuyahoga River shipping

canal in Ohio, do you believe that this water body differs from the CAWS with respect to biological potential? Why or why not?"

A. I guess the nature of my testimony wasn't that -- wasn't a critical comparison between the two. I believe that there are many similar aspects to the systems that are comparable.

They're both navigational channels, they both have modified geometry, they both have a lot of barge traffic, they both have a lot of sediments and resuspension.

There are some conditions in the CAWS that are higher elements of stress than what exists in the Cuyahoga. For instance, the CAWS is basically effluent dominated, very little flow coming in from Lake Michigan.

The CAWS also has these dramatic hydraulic swings that were discussed by Dr. Garcia earlier this morning. And another important distinction is that the CAWS is -- there's a barrier of connectivity between the Chicago waterways and Lake Michigan that doesn't exist in the Cuyahoga.

The Cuyahoga is an open barrier. So in many respects the conditions in the Chicago

area waterways are much more severe.

I only pointed out the comparison because the IEPA did make a comparison. And I thought they were -- if they were going to make the comparison -- again, this relates to the comparability discussion that we had before.

That if you're going to compare it, you ought to be more comprehensive, which I don't feel that they did. And that it would be their kind of responsibility to kind of look at similar systems and kind of make an assessment.

And I don't feel that they -- they did that job thorough enough.

BY MS. DEXTER:

Q. Can I ask you, you just -- you stated how the systems between the Cuyahoga and the Chicago area waterways differ, but I'm not sure you answered the question of how they differ in respect to its biological potential.

A. And in terms of its biological potential, I have not done a comprehensive study to compare the two of them, so I don't think I could answer that question thoroughly and accurately.

MS. DEXTER: Okay.

BY MS. WILLIAMS:

Q. I have one area I'd like to follow up on with your testimony, Mr. Freedman. And it's regarding Pages 4 and 5 and your discussion of the Illinois general use designation. I'm going to refer you to Page 5, the first full paragraph.

MR. ANDES: Page 5 of his testimony or his report?

MS. WILLIAMS: His testimony at this point. I think something similar is in the report, but...

BY THE WITNESS:

A. Yeah.

BY MS. WILLIAMS:

Q. And I am going to read the second sentence -- well, can you just read the second sentence of that paragraph?

A. Start with further?

Q. Yes.

A. "Further, general use waters are designed to protect communities predominantly composed of pollution sensitive species, where the CAWS proposed aquatic life uses decide to predict tolerant or intermediate tolerant species, which

presumably could be supported by less stringent criteria."

Q. Can you point us to the basis for your statement regarding general use water? You have a quote in the middle of that.

A. Yeah.

Q. And it doesn't refer to what you're quoting from.

A. I'm not sure I brought the -- I can give the exact page. I'm not sure I have the general use criteria here with me.

Q. Well, I don't think it's in there, that's why I -- but you think you're quoting from the general use criteria?

A. I believe so. Or it might be from the EPA criteria document.

And I'm afraid, since that wasn't one of the supplied questions, I don't have the supporting information on that. So I don't think I failed to respond right here.

Q. Why don't you take a look at Page 4 of your report and see if that jogs your memory at all. I think that's where the same information is presented.

A. I'm on Page 4 of my testimony.
Q. No, Page 4 of the --
A. From the report, excuse me. The report, yeah.
Q. And I think you do provide a citation there. And I can show you the section that you're referring to, if you want me to.
Do you see what I'm talking about?
A. I see exactly where it gives an EPA citation.
Q. And what is that, for the record?
A. It says, "IEPA Title 35, Part 202, Section 302.105."
Q. And why don't you read the sentence again. Can you read the sentence that precedes that?
A. In this -- in the report?
Q. Uh-huh.
A. "In contrast, general use waters, which apply to most Illinois streams, are designed to protect communities predominantly composed of pollution sensitive species.
Q. I'm going to show you -- I hope this is okay, for reference, it's the Board regulation.

I'm showing you the Board Regulation 302105.

A. Okay.

Q. And I'd like you to look for that language and read it. If you can find it, read it.

A. 302105?

Q. Can you just read the title of that section for the record?

A. Antidegradation. You know, I don't see those exact words here initially, and maybe I've mistakenly taken the wrong citation.

Q. Is it possible you've mistakenly defined what general use waters are defined as in the Illinois regulations also?

MR. ANDES: Is the Agency stating that this isn't the language from the Illinois regulations?

MS. WILLIAMS: That's quoted in his testimony?

MR. ANDES: Correct.

MS. WILLIAMS: Yes. As defining general use waters, yes.

I think he's implying that that language is used to define general use waters, and I don't see where that's present

in the Illinois regulations, as a definition of general use waters. I believe there is a reference of similar language possibly in that section, but that's not the same thing.

MS. TIPSORD: You know what, why don't we take a ten-minute break and let you review that language in 302105; okay?

MR. ANDES: Okay. Thank you.

(WHEREUPON, a recess was had.)

MS. TIPSORD: I think we are ready to go back on the record. And we were in the process of looking over some documents.

And, Ms. Williams?

BY THE WITNESS:

A. Can I respond?

BY MS. WILLIAMS:

Q. Yes.

A. Obviously, I've made a mistake in my reference here. I'm afraid in this time frame that I can't identify where the attribution came from, since it wasn't in the Q and A.

But the bigger point that I was trying to make here was that the general use standards were developed for a different biologic

potential than the Chicago area waterways and to protect a different collection of species. And different biologic conditions, and...

Q. Do you understand what that potential is?

MR. ANDES: Which potential?

BY THE WITNESS:

A. I guess you'd have to define that for me.

BY MS. WILLIAMS:

Q. You said the larger point you were -- let me know if I'm correct.

A. Well, I want to repeat myself.

Q. The point you were getting at is that the general use standards were developed for different biological potential. And I'm asking you, do you know what biological potential is?

A. I do know that the Chicago area waterways are very different waterways and have different biologic conditions than do the general waterways in the state of Illinois. And -- but I haven't reviewed the biologic conditions in all of the Illinois waterways to characterize their biologic condition.

Q. On Page 4 of your testimony, there's a chart. And you have General Use on one side of the chart and you have Chicago Area Waterways on the other side of the chart.

A. Yes.

Q. Can you explain what you used to develop that chart?

A. I base this on a -- certainly the column to the right, the Chicago Area Waterways, the description is based on my experience in the waterways and description of other experts. On the left-hand of this chart, I characterize what's, in general, naturally flowing waters that aren't significantly altered as are the Chicago area waterways.

Q. So you're describing in that column natural waterways?

A. Yes.

Q. Under the column that says General Use?

A. Yes.

Q. You are not attempting to -- the actual waters in Illinois that are --

A. Nothing specific.

Q. Do you know if in Illinois there are general use waters that are channelized?

A. I would expect there are some.

Q. What about general use waters that are primarily urban industrial?

A. I would expect there are some, too.

Q. What about having areas with stagnant areas?

A. I would expect there might be some.

MR. ANDES: If I can follow up on that.

Isn't there a specific provision for stagnant areas in general use waters?

THE WITNESS: Yes, there is.

BY MS. WILLIAMS:

Q. What provisions are you referring to, Mr. Freedman?

MR. ANDES: It's in his testimony.

BY THE WITNESS:

A. I believe it's referred in my testimony, if I can look that up?

BY MS. WILLIAMS:

Q. Sure.

A. Let me...

MR. ANDES: And while he's looking, if I can just clarify. Does the Agency contend that cause waters are just like general use waters? Because he's saying they're not, and that seems to be contested here in this line of questioning.

MS. WILLIAMS: Am I supposed to answer his questions, or is he making an objection?

MR. ANDES: I'm just trying to clarify.

MS. TIPSORD: I think he's trying to clarify his --

MS. WILLIAMS: I don't have a -- I think Mr. Freedman understands the question, he's looking to a page of his testimony.

BY THE WITNESS:

A. I have found the page.

BY MS. WILLIAMS:

Q. Thank you.

A. "General use waters at all locations must maintain sufficient dissolved oxygen to prevent offensive conditions, as required in Section 302.203. Quiescent and isolated sectors of general use waters, including but not limited to wetlands,

sloughs, backwaters, waters below the thermocline and lakes and reservoirs must be maintained at sufficient dissolved oxygen concentrations to support their natural ecological functions and resident aquatic communities?

And in that regard, the state seems to recognize that there are some conditions that are different in these different kinds of protection.

Q. Within the dissolved oxygen general use criteria, is that what you're referring to?

A. Yes.

Q. Would you be recommending that the Board adopt something similar towards these waterways?

A. I do recommend that the Board consider the fact that certain waterways in the CAWS system are stagnant and stratified, as Dr. Garcia had discussed this morning, and that they naturally might have lower dissolved oxygen and different biologic conditions, and special provisions should be made for those conditions.

Q. Will the District be prepared to present to the Board a proposal about what types of

stagnant conditions should be reflected in this rulemaking?

A. I guess I can't speak to what the District might be willing to propose, but it is my opinion that those kinds of conditions need special consideration. And those special considerations weren't embodied in the IEPA proposal.

I think you spent quite a bit of time this morning with Dr. Garcia talking about the complexities of the hydraulics and special conditions, and I think those conditions are unique in the state.

MS. WILLIAMS: That's all I have on this.

MS. TIPSORD: With that, we go to Ms. Dexter.

BY MS. DEXTER:

Q. I'm going to start with my prefiled Question No. 1.

"In various parts of your testimony, you mentioned temperature effects proposing but not including the IEPA adequately studied. What portion of the CAWS needs further study with regard to temperature effect?"

A. I really only mentioned temperature in the -- in some limited context in my testimony. For example, I mentioned temperature when quoting others, such as Dr. Garcia, as to the factors affecting stratified stagnant conditions, which I think are factors that need more study.

Another example I quoted was from the UAA study from CDM, which talks about water quality not meeting criteria and the need for site-specific criteria. So the questions about temperature were not really a focal point of my testimony, but this was a peripheral issue.

Q. Do you know who the significant thermal discharges to the CAWS are?

A. I didn't study the thermal discharges in the CAWS, so I wouldn't be able to rely giving an opinion on that.

Q. That's fine.

Are the current CSOs harming aquatic life in any portion of the CAWS?

A. I really have not made a study of CSO impacts on aquatic life, per se, so I -- and I didn't testify to that, so I couldn't express an opinion about the effects on actual aquatic life.

Q. I'll skip Question 4 then.

Five. "Are you aware of any wet weather standards that would allow dissolved oxygen conditions to fall below one milligram per liter and provide information on that issue?"

MR. ANDES: I believe several examples were provided on that issue.

MS. DEXTER: Of what weather standards would allow --

MR. ANDES: Yes.

MS. DEXTER: -- dissolved oxygen to fall below one milligram per liter?

MS. ANDES: Right.

MS. WILLIAMS: I thought she testified she didn't know of any wet weather aquatic life standards.

MR. ANDES: The Patapsco was an example, I believe, in Maryland.

MS. NEMURA: I testified that what the UAA has done for aquatic life uses were not specifically done with wet weather conditions in mind, but conditions addressed by the UAAs could include wet weather conditions.

MS. DEXTER: We're talking about the

variance that allows the dissolved oxygen standard to be --

MS. NEMURA: The restoration variance that was established based on the Chesapeake Bay and Patapsco.

MS. DEXTER: But no base, like, criteria has been set for less than one point...

MS. NEMURA: The restoration variance allows the DO seven percent of the spatial and temporal time. The DO criteria of 1.7 or 1.0, depending on which segment you're in, does not have to be met all the time.

THE WITNESS: If I may supplement that.

The states of Maine and Massachusetts have specific provisions that allow the suspension of DO standards or temporary suspension of them for wet weather CSO events.

MS. WILLIAMS: Can I follow up?

MS. DEXTER: Please.

BY MS. WILLIAMS:

Q. I think Ms. Nemura said she would

testify that she was not aware that the standards in Maine had ever been utilized in practice anywhere. Do you disagree with that?

BY THE WITNESS:

A. I don't disagree with that. I'm just staying that the State Water Quality Standards provide the allowance for that condition.

MR. ANDES: I think that was the question.

BY THE WITNESS:

A. And that was all that I was stating.

MS. DEXTER: Okay.

MR. ANDES: We also have copies of the Maine and Massachusetts regulations, that we can introduce.

The first document is from the Maine Water Quality Standards, 38, Section 464 of classification of Maine waters.

MS. TIPSORD: If there's no objection, we will mark the Maine Classification of Waters.

MS. WILLIAMS: I have an objection. I'm sorry, but it goes from Page 1 to Page 3.

MR. ANDES: The relevant sections may

not site all the various pages of that particular Maine regulation, only the relevant portions.

MS. TIPSORD: With that -- with noting that, I'm going to enter it over Ms. William's objection as Exhibit 207.

(WHEREUPON, a certain document was marked Exhibit No. 207 for identification, as of 2/17/09.)

MR. ANDES: The same is true as to the following exhibit, which is from 314CMR4.00 Massachusetts Surface Water Quality Standards. The particular excerpt that's included beyond the first page is Section 4.06, that's the relevant section.

MS. TIPSORD: If there's no objection, we will site -- we will enter the Massachusetts 31CMR for Division of Water Pollution Control, Massachusetts Water Quality Standards as Exhibit 208 -- excerpt.

MS. WILLIAMS: And I would just like to request for the record that with regard to Exhibit 207, that the District be asked to

supplement with this Page 2. Because I have -- I think I have reviewed these regs, and I do think what's on Page 2 is relevant.

Do you see what I'm saying? It starts with procedures for reclassification and then it cuts off. Would you be willing to do that?

MR. ANDES: Sure. I think the portion, though, that we were discussing is the temporary removal of designated uses section, Section 2(b), sewer overflows.

And that's why we didn't include Pages 2 or 5 or 6 or 7. But I can certainly provide Page 2.

MS. TIPSORD: If there's no objection to entering Exhibit 208, it's entered.

Seeing none, we will enter it.

(WHEREUPON, a certain document was marked Exhibit No. 208 for identification, as of 2/17/09.)

MS. DEXTER: I have no further questions or witnesses.

MS. TIPSORD: Anything else for

Mr. Freedman?

MS. DIERS: Thank you very much, Mr. Freedman.

THE WITNESS: Thank you.

(WHEREUPON, the witness was excused.)

MS. TIPSORD: That moves us on to Dr. Dennison.

Good afternoon, Dr. Dennison.

I will remind you you've been sworn in at least twice before, so we will not do so again. You are still under oath.

And with that, we can do his prefiled testimony.

MR. ANDES: Yes.

MS. TIPSORD: If there's no objection, we will enter Dr. Dennison's prefiled testimony in this section, which is on behalf of the District, concerning dissolved oxygen standards proposed for protecting aquatic life in the designated Aquatic Life Use A Waters and Aquatic Life Use B Waters of the Chicago Area Water System. We will enter that as Exhibit 209, if there's no objection.

Seeing none, it's Exhibit 209.

(WHEREUPON, a certain document was marked Exhibit No. 209 for identification, as of 2/17/09.)

SAMUEL G. DENNISON,

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

EXAMINATION

BY MS. DIERS:

Q. Dr. Dennison, I'm going to start with Question 2 of your prefiled questions. Can you please describe the Winkler Titration Method mentioned on Page 3 of your prefiled testimony?

A. The Winkler Titration Method is a chemical procedure for determining the oxygen concentration in a sample of water. We use the method as given in standard methods for the examination of water and waste water method 4500-0C azide modification.

A 300 ml water sample that is collected and chemically fixed in the field is brought to the laboratory and manually titrated

using a digital buret. Dissolved oxygen is expressed in milligrams per liter.

MR. ANDES: And I have copies of that method. This is from A Standard Method For the Examination of Water and Waste Water, 19th edition, 1995. It's the excerpt involving method 4500-0C azide modification.

MS. TIPSORD: If there's no objection, we will enter this, Standard Methods For the Examination of Water and Waste Water, as Exhibit 210.

Seeing none, it's Exhibit 210.

(WHEREUPON, a certain document was marked Exhibit No. 210 for identification, as of 2/17/09.)

BY MS. DIERS:

Q. Question 3.

"Why are you of the opinion that additional aeration systems will not increase the fish population in the CAWS?"

A. Because of the severe aquatic habitat limitations of the Chicago area waterway system, additional aeration systems would not be expected to

substantially increase the fish population in the CAWS. This was discussed by Drs. Mackey and Melching, and I have also had personal knowledge of habitat limitations, which I mentioned in my testimony on the Cal Sag Channel and on Bubbly Creek.

Q. Question 4.

"On Pages 3 and 4 of your prefiled testimony, you referenced compliance statistics for the continuous monitoring stations with the lowest compliance rates on proposed dissolved oxygen standards occurring during the years 2005 through 2007. Why is compliance with the proposal lower at the identified stations than at the other stations?"

A. Well, there are more instances of low dissolved oxygen at those stations. I have not done an analysis as to why this is, there could be many factors throughout the CAWS.

I suggest that you wait for ongoing studies to be completed.

Q. And what studies are you referring to?

A. For example, the Habitat Evaluation Study. And I think there are a number of others, but that's the one that comes to mind as the most

important.

Q. Question 5.

"What would you recommend for CAWS A waters with respect to dissolved oxygen?"

A. I agree with the testimonies of Dr. Mackey and Melching and Mr. Freedman.

Q. I'm sorry, could you repeat that?

A. I agree with the testimonies of Dr. Mackey, Dr. Melching and Mr. Freedman.

Q. And did they say they didn't have a recommendation for dissolved oxygen?

MR. ANDES: Does he have to characterize their testimony?

MS. DIERS: I'm asking a question. I can't remember what we talked about in December.

So if he can answer it, fine. If he can't, fine.

BY THE WITNESS:

A. Yes, I can't be more specific than to say that we should wait for these studies to be completed.

BY MS. DIERS:

Q. Once these studies are completed, is

the District going to make a recommendation for these waters to the Board?

A. I don't know.

MR. ANDES: That question can certainly be raised to Dr. Grenado when he raps up testimony for the District.

MS. DIERS: Can we just have a second?

MS. TIPSORD: Sure.

MS. DIERS: Thank you.

I have nothing further.

MS. TIPSORD: Anything further for Dr. Dennison?

MS. DEXTER: I have one follow-up question.

BY MS. DEXTER:

Q. This morning, when we were talking to Dr. Nemura about what Tarp could do, there was some uncertainty about whether or not Tarp would address the -- CSOs. Do you have any insight on that?

MR. ANDES: Is that on --

BY THE WITNESS:

A. Could you repeat the question? I didn't quite catch the last part of the sentence.

BY MS. DEXTER:

Q. This morning when we talked to Dr. Nemura, she wasn't certain whether Tarp would address more than just gravity CSOs if there was -- if it would also address those from the stations. Do you know more about Tarp, as an employee of the District, that you can shed some light on that?

MR. ANDES: So particularly with regard to, say, pump stations?

MS. DEXTER: Particularly with regard to the uncertainty that Dr. Nemura had this morning, about whether Tarp would do more than just gravity.

MR. ANDES: Let me see if I can help.

Is it your understanding that Tarp will eliminate all the pump stations based on your understanding?

THE WITNESS: No.

MR. ANDES: It might reduce the discharges from some of them?

THE WITNESS: Certainly.

MR. ANDES: Is it going to eliminate all of the CSO discharge points?

THE WITNESS: It's not understand that

it would.

MR. ANDES: But it might reduce the number and reduce the frequency of overflows to some extent?

THE WITNESS: Yes.

MR. ANDES: Okay.

MS. DEXTER: I guess that's pretty good.

MS. TIPSORD: Anything else for Dr. Dennison.

Thank you very much Dr. Dennison.

(WHEREUPON, the witness was excused.)

MS. TIPSORD: Let's go off the record for just a second.

(WHEREUPON, discussion was had off the record.)

MS. TIPSORD: Back on the record. Instead of adjourning this hearing, I'm going to continue this hearing on the record to March 3rd and 4th, both hearings to be continued here Chicago. I've talked to Mr. Andes off the record and his witnesses will be available on those two days. And we

plan to finish with the last five of the district's witnesses on March 3rd and 4th. We also will have a prehearing conference on February 27th at 1:00 in the afternoon by phone. And we will discuss at that point additional hearings in April, May, June and what that schedule is going to look like.

I thank you all again for your patience and for your willingness to compromise and work on these issues. If you all weren't as willing as you are to do this stuff, this could be a very much more difficult time for all of us. So thank you all again.

And with that, we will continue this on the record, and we are recessed for today. Thank you.

And I will do a hearing officer order laying out rooms, time, phone numbers, all of that.

(WHICH WERE ALL THE MATTERS HEARD IN THE ABOVE-ENTITLED CAUSE THIS DATE.)

STATE OF ILLINOIS)
) SS:
COUNTY OF COOK)

I, SHARON BERKERY, a Notary Public within and for the County of Cook, State of Illinois, and a Certified Shorthand Reporter of said state, do hereby certify:

That previous to the commencement of the examination of the witness herein, the witness was duly sworn to testify the whole truth concerning the matters herein;

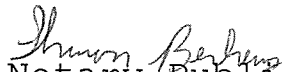
That the foregoing hearing transcript was reported stenographically by me, was thereafter reduced to typewriting under my personal direction and constitutes a true record of the testimony given and the proceedings had;

That the said hearing was taken before me at the time and place specified;

That I am not a relative or employee of attorney or counsel, nor a relative or employee of such attorney or counsel for any of the parties hereto, nor interested directly or indirectly in the outcome of this action.

IN WITNESS WHEREOF, I do hereunto set

my hand and affix my seal of office at Chicago, Illinois, this 23rd day of February, 2009.



Notary Public, Cook County, Illinois.

My commission expires 7/22/2010.

C.S.R. Certificate No. 84-4327