ORIGINAL

ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
WATER QUALITY STANDARDS AND	)	R08-09
EFFLUENT LIMITATIONS FOR THE	)	(Rulemaking-
CHICAGO AREA WATERWAY SYSTEM	)	Water
AND THE LOWER DES PLAINES	)	
RIVER: PROPOSED AMENDMENTS	)	
TO 35 Ill. Adm. Code Parts 301,	)	
302, 303 and 304	)	

REPORT OF THE PROCEEDINGS held in the above entitled cause before Hearing Officer Marie Tipsord, called by the Illinois Pollution Control Board, taken by Steven Brickey, CSR, for the State of Illinois, 100 West Randolph Street, Chicago, Illinois, on the 17th day of May, 2011, commencing at the hour of 1:30 p.m.

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I N D E X

THE WITNESS: JENNIFER WASIK

E X H I B I T S

MS. TIPSORD: Let's go on the record. We're going to start with Ms. Franzetti and Midwest Generation.

E X A M I N A T I O N

BY MS. FRANZETTI

Q. Good afternoon, Ms. Wasik. My name is Susan Franzetti. I'm counsel for Midwest Generation. If at any time my questions are unclear to you, please let me know and I will rephrase them so you can understand them. All right?

A. Yes.

Q. Thank you. Question one. On page four of your pre-filed testimony, you state that when the habit index scores are borderline or inconclusive other important factors should be considered including sediment toxicity and unique flow conditions.

Please explain further how such other important factors should be considered in determining the appropriate use classification for a given waterbody?

A. This is described on pages six through eight of attachment one to my testimony.

Basically, as I touched on earlier with IEPA's questions, we faced a continuum of habitat index scores which we used as a first cut to try and classify the waterways into either category one or category two in the CAWS and there were some that were clearly relatively higher and those that were relatively lower. So these were on the easier end to classify. However, some scores that fell more in the middle required a bit more scrutiny. So with the -- in two cases, the Lower North Branch of the Chicago River and the Chicago River main stem since their scores were 47 and 45, which was right in the middle of the continuum, we had a waterway with the score of 49 that was in category one and waterway that was in category two with a score of 47.

So we wanted to use other information to classify the waterways, these waterways. So as I described in my attachment, there were various key habitat features that were worse in the Lower North Branch than in the Upper North Branch. So it appeared reasonable that they should be in two different groups. For example, vertical wall banks, riparian vegetation, bank

pocket areas, large substrate and organic sludge were all different enough that we felt they should be considered in two different categories and in addition there were toxic sediments present according to our toxicity essay in the Lower North Branch Chicago River. So considering all of these factors, we decided that the Lower North Branch belonged in category two.

Q. Do you recall whether -- I think this morning you did indicate Bubbly Creek. Is that an example of unique flow conditions that effected how you classified?

A. Yes, there are a few waterways we ended up classifying as a category three water which were diagnosed waterbodies and I think we did Bubbly Creek, the Grand Calumet River, off channel slips such as the collateral channel and the North Branch Canal. Areas that don't receive flow. We felt that another category should be present to account for these issues as well.

Q. Moving onto question two. As you note on page three of attachment one to your pre-filed testimony, CAWS habitat index scores were determined for all the of the CAWS reaches

between the Wilmette pump station, Chicago River Controlling Works and O'Brien Lock and Dam and the Lockport Lock and Dam and those results are presented in Table 7-7 on page 139 of the Habitat Evaluation Report. Is it correct that the CAWS habitat index scores the highest score was achieved by the North Shore Channel with a score of 75?

A. Yes, that's correct.

Q. Is it correct that the Upper North Shore Channel along with the Little Calumet River, which scored a 52, and the Upper North Branch Chicago River which scored a 49 are all proposed to be included in category one?

A. Yes.

Q. Is it also correct that the CAWS habitat index scores were a major factor in the proposed classification system, but not the only factor used to slot individual segments into the proposed category one through three use classification?

A. I would say that is true with the caveat mostly between category one and two. We used habitat index scores. Category three were

the stagnant flow conditions.

Q. I think you've answered B earlier in discussing the habitat improvement study in response to the Agency's questions. Let me check E. I think you also discussed E in response to the Agency's questions. I want to skip E. I think you touched on F, but I'm going to ask F.

Why did the review of habitat improvement potential result -- I'm sorry. Why did the review of the habitat improvement potential result in these scores not going up significantly?

A. Certain conditions are not improvable in the index including maximum channel depth, manmade structures, lack of large substrate and presence of organic sludge. These conditions are not feasible to improve and also various waterways may or may not have potential for other improvements and still meet the needs of navigation flood water conveyance, et cetera.

Q. Moving to three. Does category one score any segment that scores above 80 and up to 100 or is it contemplated that there may be another category above category one?

A. No, not in the CAWS.

MR. ANDES: Just to be clear. You're answering the first part of that question. Does category one cover any segment with a score above 80 and up to 100 and the answer is, no, not in the CAWS?

THE WITNESS: Or is it contemplated that there may be.

BY MS. FRANZETTI:

Q. So the second part -- let's break it down. Does category one cover any segments that score above 80 and up to 100?

A. No.

Q. Because there weren't any that scored in that range, correct?

A. Yes.

Q. Is it contemplated that there may be another category above category one?

A. Not for the CAWS.

Q. And you've got no opinion as to whether or not the Upper Dresden Island Pool, for example, might fit in above category one?

A. Possibly. I don't have -- I, personally, don't have data on that.

Q. Question four.

MS. WILLIAMS: Can I follow up on that really quick? Could you even use the habitat index to even apply to the Lower Des Plaines River or is it CAWS specific?

THE WITNESS: I think because it was generated using CAWS data I'm not sure that it could be used in the Des Plaines, but there are some similarities that might make that a useful comparison or a useful tool. I don't know.

BY MS. FRANZETTI:

Q. Question four. Were there other factors beyond the habitat index score with and without habitat improvement that were used to place segments of the CAWS into the proposed use classification that you have not already identified in your testimony today?

A. I don't think so. I think we've discussed them all now.

Q. Question five, on page four of your pre-filed testimony in connection with the discussion of the District's category one proposed use designation you note that the Upper Branch of the Chicago River and Little Calumet River should

both be placed in category one. Is it correct that neither these waters is manmade, but both are rivers that have been channelized?

A. Yes.

Q. Please describe further what you mean by your testimony that while each of these waterbodies contain reaches with earth and bank, they are, quote, steeper than most found in natural systems?

A. Just that there's not natural connectivity with the floodplain. There are steep banks that are specifically designed that way. They're channelized to prevent flooding and to convey treated waste water effectively out of the system.

Q. You state on page four that, quote, some areas of in stream cover (EG overhanging riparian vegetation, fixed aquatic vegetation, boulders or woody debris), end quote, exist in these areas, can you provide more information concerning the extent of the in stream cover that exists for the Upper Branch Chicago River and the Little Calumet River respectfully?

A. I would refer you to page 136 of the

Habitat Evaluation Report Table 7-5. It contains the values of key habitat variables assigned to the CAWS reaches. In terms of the Upper North Branch Chicago River, there is an overhanging vegetation parameter. This has percent overhanging vegetation for your first example, which is one example of in stream cover.

Q. What is the percent in that table?

A. For the Upper North Branch, it's 25 percent and for the Little Calumet River it was six percent.

MS. WILLIAMS: Ms. Wasik, do you know if that means there were more quantity wise, more overhanging vegetation in the North Branch or is that number a ratio?

THE WITNESS: It's a percentage.

MS. WILLIAMS: So they could have the same quantity, but it would be -- or no?

MS. FRANZETTI: It's a pretty big spread. 6 percent to 25 percent to have the same --

THE WITNESS: It probably wouldn't be the same. I'm not sure of the exact length of segments, but I would say --

MS. WILLIAMS: What is the relevant question; length or width?

THE WITNESS: It would be length for overhanging vegetation.

MS. WILLIAMS: Isn't the percent overhanging vegetation a function of the percent across the width, isn't that how that metric is determined? So if you have -- really isn't it just a function of how wide is your stream, not how much vegetation do you have?

THE WITNESS: I believe the percent overhanging vegetation is actually by length of the waterway. Limnotech did a video survey and I think by length these are the percentages that had overhanging vegetation.

BY MS. FRANZETTI:

Q. Just so it's clear in the record. The percentages, that is the percentage of the study location area that was the 400 meter length that Mr. Bell has testified to, correct, Ms. Wasik?

A. Actually, I think these may have been -- let me see here. Certain characteristics that could be measured by the video survey I

believe include the entire reach.

Q. Do you know sitting here offhand?

A. I would want to direct that to Scott, but that is my understanding.

MR. ANDES: Do you want us to have Mr. Bell answer the question?

MS. FRANZETTI: If you don't mind. At least on this issue, are the percentages based on -- Fred, the question is, are the percentages on that table based on a percentage of the 400 meter study location area in that segment or is it the length of the actual, for example, Little Calumet River that that's a percentage?

MR. ANDES: Do you know which table you're referring to?

MR. BELL: No. Show me what table you're on.

MS. TIPSORD: I just remind Mr. Bell is still under oath.

THE WITNESS: Table 7-5, but the question is actually different because it's based on the 400 meter stretch or the video survey and I think the overhanging vegetation was based on the video survey.

MR. BELL: So the original measurements are based on a percentage of the 400 meter sampling reach area. So we take the area covered by overhanging vegetation in that 400 meter reach on both banks, divide it by the total area of the 400 meters. So length times width of overhanging vegetation divided by length times width of the 400 meter channel segment.

Then, when we extrapolate that to characterize the entire reach, we use the digital video to assess similarity along, let's say, the entire North Shore Channel and extrapolate those field areas based on measurements through the whole section, but it's still representative of percentage of channel area. So does that answer the question?

MS. FRANZETTI: I think it does.

MR. BELL: Okay.

MS. WILLIAMS: Do you now want to change your answer, Jennifer?

THE WITNESS: To what he said? Yes.

BY MS. FRANZETTI:

Q. It's only fair, Ms. Wasik, because they were all deferring to you that you get a

chance to say I say what he said. Subparagraph C you state that, quote, relatively lower depth areas may be present in these waters. Please explain in more detail what you mean by this statement?

A. There are some areas in category one water that have shallower waters than most category two waters. The max depth in the same Table 7-5 and side depths tend to be shallower, for instance, in category one waters than in the Chicago Sanitary and Ship Canal or in the Cal-Sag Channel.

Q. So the relatively lower depth there is really referring to as compared to category two waters?

A. Right, relative to other CAWS waters.

Q. Moving onto D. You state that, quote, commercial navigation is generally absent in category one waters with the exception of the Little Calumet River, end quote. Is there any commercial navigation in the Upper Branch Chicago River? That might have been asked this morning. I don't remember which segment was specifically

asked about?

A. No, not in the Upper North Branch Chicago River.

Q. Do you have any information concerning the extent of the commercial navigation in the Little Calumet River other than what is already contained in the Limnotech report? We touched on this the other day with Mr. Bell, but I don't know whether the District also looked at potentially more recent commercial navigation data as well in categorizing the waters?

A. I don't think I have any additional information. I did look at the Army Corps website which I believe was where Limnotech also got their data, but just looking at one year for an example I have tonnages through Lockport in 2008 were just over 12 million and at the -- I'm sorry. Yeah, at O'Brien Lock it was 6.8 tons.

Q. Also, in 2008?

A. Yes.

Q. That is more recent data than what I think is in the Limnotech report. It might have ended in 2005?

A. I'd say the navigation is somewhat

more significant in the Ship Canal than the Little Calumet.

Q. Moving onto six. On pages four to five of your pre-filed testimony, you state that, quote, while fine sediment -- while fine sediments may be widespread in the CAWS category one waters, a majority of sediment samples were demonstrated to be nontoxic, end quote. Is it correct then to state that the category one waters do not generally exhibit the stressor of contaminated sediments?

A. I would say that sediment contamination is pretty ubiquitous throughout the CAWS. According to our sediment chemistry data, if you look at various threshold values for sediment contamination in the literature, there are elevated values of various constituents in sediments throughout category one and category two waters.

Q. Is it correct to state that the category one waters do have sedimentation issues that adversely impact the quality of the physical habitat for the fish community?

A. Yes, definitely the siltation and

major sedimentation is throughout category one and two waters of the CAWS. There's fine sediments throughout.

Q. Is it correct that unlike the category two waters, category one waters do not have a majority of sediment samples showing contaminated sediments are present? In other words, is that generally a distinction between category one and category two waters?

A. So we're talking about sediment contamination whereas one of the factors that the District used in order to classify waterway segments into category one or two was our sediment toxicity data and that is where we found a majority of sediment samples in category two waters showed toxicity.

Q. So if I change that question to say is it correct that unlike category two waters category one waters do not have a majority of sediment samples showing toxic sediments are present, would you agree with that?

A. That that's generally true, yes.

MS. WILLIAMS: Are there any samples, Ms. Wasik, where you used the absence of

a majority of contaminated sediments to upgrade the water from its Habitat Evaluation Report?

THE WITNESS: No.

BY MS. FRANZETTI:

Q. Moving to question seven. On page five of your pre-filed testimony, you state that, quote, habitat features that are important to sustaining healthy and balanced warm water aquatic communities as discussed in Dr. Mackey's testimony are not widespread in category one waters, however, the physical habitat in category one waters is relatively better than other waterways in the CAWS, end quote.

Please explain further which of the important habitat features are present, but not widespread in category one waters and how the physical habitat in category one waters is relatively better than other parts of the CAWS?

MR. ANDES: Let me hold you right there for a second. I want to follow up. Let me interrupt. I want to go and follow up on --

MS. WILLIAMS: I think she should answer the question on the record first before we follow up.

MR. ANDES: It's a follow up on your question.

MS. FRANZETTI: I don't think it's worth arguing about it. If he wants to go back to your topic, I think it's better to have it come sooner in the transcript than start another subject.

MS. WILLIAMS: Okay.

MS. FRANZETTI: It's up to me. Go ahead.

MR. ANDES: Thank you. Can you go over again to what extent the absence of toxic sediment samples resulted in waters moving up rather than down?

THE WITNESS: Well, back to your question, Deb, basically the way I described it in my testimony in the Lower North Branch Chicago River the presence of toxic sediments cause that to be in a lower category, but I suppose maybe it's a glass half full half empty scenario where that also played into the fact that the North Branch, the Upper North Branch, not having toxic sediments played into that being in a higher category.

MS. WILLIAMS: Really?

THE WITNESS: Really, yes.

MS. WILLIAMS: So what about the other factors? Were there any other -- when you looked at navigation, were there any waters that you used lack of navigation to put into a higher category instead of using it to put into a lower category?

THE WITNESS: I think we talked about this earlier in materials of the North Branch, specifically the Upper and Lower North Branch being navigation versus lack of navigation, toxicity versus lack of toxicity. I think that played into it, yes.

MS. WILLIAMS: Not just the habitat score, but you also looked at the lack of the contaminated sediments?

THE WITNESS: Toxicity. Sediment toxicity. Not contamination necessarily.

MS. WILLIAMS: Okay. Thank you.

MR. ANDES: I'm sorry for the interruption.

MS. FRANZETTI: It's okay. I'm going to repeat a portion of the question seven

just so the transcript is a little easier to follow.

BY MS. FRANZETTI:

Q. Which of the important habitat features are present, but not widespread in category one waters and explain how the physical habitat in category one waters is relatively better than other parts of the CAWS?

A. So what is relatively better about it is the extent to which some of the physical habitat parameters are present in category one versus category two. So, in this instance, we're talking about aquatic vegetation, woody debris, overhanging cover, in general, are more prevalent or the extent to which they're presence in higher in category one versus category two waters.

Q. Those habitat features that you just mentioned, are those the important habitat features that are present, but not widespread in category one or do you want to add some more is what I'm getting at?

A. These were the main examples. If you wanted to go over other parameters specifically, we could. That same table that we

were referring to earlier, 7-5, has various reaches and habitat variables.

Q. I was just really trying to get a sense of when you used the phrase in that portion of your testimony important habitat features?

A. These are the main examples.

Q. Okay. I correct myself. That's not your phrase important habitat features. That's my phrase. Moving onto question A. You also state on page five of your pre-filed testimony that there are, quote, a number of habitat attributes that prevent category one waters from achieving the Clean Water Act's aquatic life goal and are not reversible in the foreseeable feature. I believe your testimony this morning pretty well covered that, but are there any additional points you would add in response to this question?

A. Just to be safe. I'll say -- I'm referring to sinuosity channel development which is -- and morphology following or pool riffle alternations, various depths and flows, max channel depth, channelization in general, floodplain connectivity, lack of large substrates and the presence of organic sludge are all

examples of the habitat attributes that I was referring to and cannot maintain the current uses of navigation and flood control and water conveyance and change most of these parameters.

Q. Question eight. On page five of your pre-filed testimony in describing the category one waters you state that, quote, physical habitat in these reaches is not adequate to support a warm water aquatic community that fully meets the goals of the Clean Water Act, nor do they have the potential to do so.

Is it correct then to state that the category one waters use designation is for waters that do not currently meet and do not have the potential to meet the Clean Water Act aquatic life goal?

A. Yes.

Q. Moving to question A and I'm looking for a qualitative answer here, not a specific measurement. To what extent do the category one waters fall short of meeting the Clean Water Act's aquatic life goal in your opinion?

A. I think for the reasons we've outlined in previous answers to your previous

questions, they are all still well below the potential to meet the Clean Water Act below the potential -- the potential to meet the Clean Water Act goals. So significantly lower.

Q. Moving onto B. Is it also correct that the waterbodies that the District is proposing to include in category one waters has conditions that satisfy one or more of the UAA factors?

A. Yes.

Q. Question nine. On page five of your pre-filed testimony referring to the CAWS, generally you state that limited habitat features have, quote, resulted in a biotic community as measured by fish that is tolerant of the modified conditions and appears to be thriving.

Is it correct that you are referring here to the fact that the CAWS fish community is generally dominated by fish species that are tolerant of the limited physical habitat features present in these waters?

A. Yes.

Q. Is it correct that relatively few species, mostly so-called tolerant species, can

thrive in these waters?

A. Yes.

Q. B, are examples of these species; gizzard shad, common carp, green sunfish and blunt nose minnow?

A. Yes.

Q. Do you agree that generally in the CAWS the quality of the fish community is relatively poor?

A. Yes.

Q. Question ten, on page five of your pre-filed testimony you state that, quote, the abundance number and weight of large mouth bass and bluegill is significantly higher in category one waters than category two waters. Would you please provide an estimate of the degree to which the abundance of large mouth bass and bluegill is significantly higher in category one waters?

A. In 2000 -- according to 2001 through 2008 District fish data, the abundance was about double for large mouth bass in category one than category two waters. It was 939 versus 469 individuals and about one and a half times more for bluegill it was 347 versus 537 individuals.

Q. I'm sorry. Could you give me the bluegill numbers -- individual numbers again?

A. Category one and two respectfully were 537 and 347 individual bluegill.

Q. Why is this a relevant factor for distinguishing category one from category two waters?

A. I think it's relevant because these fish are more prevalent in category one versus category two because of the relatively better physical habitat conditions for forging shelter and other life functions of the fish.

Q. In terms of fish community, is the presence of more large mouth bass and bluegills the only biological factor that distinguishes category one from category two?

A. There were not a lot of statistical biological differences that could be identified between category one and category two waterways. Some of the other significant ones were white suckers and the abundance was 135 versus 6 individuals in 2001 through 2008.

In rock bass, there was 156 individuals versus 3 in category two, but these

catches are both very low compared to the more common fish that you get in the CAWS. We looked at macroinvertebrate data, but didn't really see any significant differences in those populations between category one and two waters probably because as I was saying earlier there's silt and contaminated sediments at least throughout the entire system in both category one and two waters.

Q. Moving onto question 11. On page five of your pre-filed testimony, you state, quote, in addition, the abundance of these fish species has increased more in category one waters than in category two waters even though water quality improved throughout all of these waterways. The District believes this can be attributed to the slightly better physical habitat conditions present in category one waters, end quote.

Please explain in more detail why the District believes this can be attributed to the slightly better physical habitat conditions present in category one waters?

A. Because we know water quality has changed very significantly since the '70s and over

time whereas habitat has largely stayed the same since this time. I think you can assume the greater increase in abundance of large mouth bass and bluegill in category one versus category two waters is likely due to the better habitat.

Q. Is a piece of that also your testimony that -- you testified earlier that for the most part in about the last ten years we haven't seen significant water quality improvement?

A. That's true I would say.

MR. ETTINGER: Excuse me. When does the District open its aeration stations in the North Branch?

THE WITNESS: I'm not sure.

MR. ETTINGER: Thank you.

MS. TIPSORD: Mr. Harley?

MR. HARLEY: Over what period of time has the abundance of fish species increased more in category one than in category two?

THE WITNESS: I'll just check my testimony.

MR. HARLEY: Well, I believe your testimony cites to page five, but that doesn't

include any timeframe during which fish populations became more abundant.

THE WITNESS: Just a moment. I'll consult some of my backup documents here. I have to get back to you on that. I don't have the exact dates with me. I'm not finding them at the moment, but I believe because we were looking at historical fish data the District has collected data since the '70s. I'm not sure exactly what years were used in that analysis.

BY MS. FRANZETTI:

Q. But you're thinking it was a multi-decade period?

A. I believe so.

Q. With respect to another reason that you may see the greater abundance in category one versus category two given that the District did look at sediment toxicity for allocated waters in part to category one and two, especially the ones that kind of scored there in the middle, do you think maybe sediment toxicity is also contributing to this abundance issue?

A. I'm not sure I can say that based on the available data.

MR. ANDES: Let me see if I can clarify. Are you saying that if water quality improvements extended throughout the system and the habitat characteristics were basically the same throughout the testimony over time, that the one factor that differs between the category one and two waters is the difference in habitat quality and, therefore, it is logical to say that's the main reason for the difference in biology?

THE WITNESS: Exactly.

BY MS. FRANZETTI:

Q. Moving onto question 12. On page six of your pre-filed testimony in your description of the Calumet River south of 130th Street to the O'Brien Lock and Dam you reference, quote, a side channel -- channel shallow (approximately 3 feet depth area) with relatively abundant fixed aquatic vegetation is present where the channel widens. A gradually sloping bank with emergent vegetation is present in this reach of the Calumet River to an extent not found in other areas of the CAWS, end quote. Can you provide an estimated percentage of the Calumet River area

that this reach represents?

A. Sure. The reach to which I was referring constitutes about one mile on the west bank and just under a mile or 0.8 miles on the east bank north of the O'Brien Lock. So the whole Calumet River is about seven miles. So, I think, about 14 percent would be one mile out of seven and the whole CAWS obviously is about 78 miles.

Q. That's okay. I don't need to go that big.

MR. ANDES: Let me ask the question then. What percentage of the full CAWS is this area?

MS. FRANZETTI: If your counsel wishes to, however, that's his prerogative.

THE WITNESS: Then we're looking at one mile out of 78. So one and a half percent. 1.3 percent.

MR. ANDES: Thank you.

BY MS. FRANZETTI:

Q. Question 13. On page six of attachment one to your pre-filed testimony, you indicate that, quote, the CAWS fish species assemblage is composed primarily 96 percent of

fish in three families. Do you mean that 96 percent of the species are in these three families?

A. No, I don't think that's what I mean.

Q. What do you mean?

A. It's slightly different. 96 percent of all of the individual fish collected are from one of these three families.

Q. So if, for example, you collected 1,000 fish, 960 of them are in these three families?

A. Yes, that would be a good, simple example.

Q. Question A, you further state that 40 percent of all fish collected were clupeidaes. Were the vast majority of those clupeidaes gizzard shad?

A. Yes. 99.8 percent of these were gizzard shad between 2001 and 2008.

Q. Are these clupeidaes one of the three fish families that make up 96 percent of the fish species collected in the CAWS?

A. Yes.

MR. ANDES: Can you break it down a little more among the clupeidaes how many of them were gizzard shad as opposed to other fish?

THE WITNESS: So 10,283 individuals were gizzard shad, 15 were alewives and we caught four skip jack herrings. Those are all clupeidaes.

BY MS. FRANZETTI:

Q. You caught four what?

A. Skip jack herring.

MR. ANDES: Similar to a small herring.

BY MS. FRANZETTI:

Q. Question B, was the carp and minnow family also called cyprinidae one of the three fish families and did this family make up 37 percent of the fish community?

A. Yes and yes. 36 percent of the cyprinidae caught between 2001 and 2008 were emerald shiners. 30 percent were common carp and 20 percent were blunt nose minnows.

Q. Thank you for providing that so I didn't have to say that word again. Moving onto C. Was the last of the three fish families that

made up 96 percent of all fish species in the CAWS in the sunfish family?

A. Yes.

Q. Is it also correct that tolerant and moderately tolerant species dominated within the sunfish family?

A. Yes, mostly these were large mouth bass, pumpkin seed and bluegill.

Q. Question 14. Does the CAWS fish data also show that except for small mouth bass, intolerant or moderately intolerant species are rare or absent in the CAWS?

A. It depends on your classification of moderately intolerant species. Very moderately tolerant or --

Q. Okay. We were actually using the term moderately intolerant species to be a separate classification than moderately tolerant and coming up from Ohio EPA's fish classification system which does have all four categories in it; tolerant, moderately tolerant, moderately intolerant and intolerant, does that help?

A. Yes, I believe in that case that what you said is true except for small mouth bass

intolerant or moderately intolerant species are rare or absent.

Q. Have I gotten the correct understanding from listening to the testimony that the District itself does not make that distinction between moderately tolerant and moderately intolerant like Ohio's fish classification system and you just put all of those into the moderate category?

A. No, I mean the District doesn't necessarily classify these fish on our own volition. We use various indices. We calculated Ohio, Wisconsin IBI's, Illinois IBI, the CAR IBI and you use whatever tables of fish tolerance are set forth in those documents for those calculations. The Illinois IBI has tolerant and intolerant classifications I believe and there are those that aren't classified so I make the assumption that those are moderately tolerant.

MS. WILLIAMS: Do you know if that's the same assumption that the Limnotech report made or did they put them all into tolerant if they weren't classified?

THE WITNESS: They actually used not

just the Illinois IBI references, but I think they had maybe eight different references that they used for tolerance classifications.

BY MS. FRANZETTI:

Q. Do you know, and if not perhaps we can impose to ask Mr. Bell for the Limnotech report, is it correct that they did just use three classifications; tolerant, moderate and intolerant?

A. Yes, that's true.

Q. Do you know what defined the moderate category whether it was a certain indices that was being used or was it a combination and then Limnotech made a decision that it fell into the moderate category?

A. It looks like page -- where are we? Appendix A of the Limnotech Habitat Evaluation Report. One of the last pages of that appendix has their classifications of the fish that were collected in the CAWS during the study years and their moderate tolerance they used USGS 2008, EPA 2008 and Platkin, et al 1999. So there were different references. I couldn't speak any further to their --

Q. Can you actually stay with Appendix A for the next question? In my pre-filed questions looking at Figure 2-6 in Appendix A, Habitat Evaluation Report, again, Public Comment 284.

Is it correct that the five most common species in the CAWS in the 2001 to 2007 time period were all tolerant species and accounted for nearly 75 percent of all fish collected?

A. So if you use the Limnotech Appendix A classifications, then the tolerants were; gizzard shad, emerald shiner, common carp, blunt nose minnow, golden shiner, green sunfish and large mouth bass. The moderately tolerant were pumpkin seed, bluegill and spot fin shiner.

MR. ANDES: Those are the top ten, right?

THE WITNESS: Yes.

BY MS. FRANZETTI:

Q. I was going a little narrower. The five most common species were all tolerant species?

A. Yes.

Q. And they did, in fact, account for nearly 75 percent of all fish collected?

A. Yes, I think that's true.

Q. Moving to B, which is a little different now based on that same 2001 to '07 fish data. Is it correct that seven of the top nine were tolerant and the remaining two were moderately tolerant and all nine of those together accounted for 90 percent of all fish collected?

A. Yes.

MR. ETTINGER: Do you know of any Midwest rivers in which the top five species are not tolerant?

THE WITNESS: Not offhand. I'm not sure.

MR. ETTINGER: What would you think for the Illinois River?

THE WITNESS: Do I think top five Illinois River species are tolerant?

MR. ETTINGER: Tolerant.

THE WITNESS: I wouldn't necessarily think that was true. I would have to look at the data.

MR. ETTINGER: We will.

THE WITNESS: Okay.

BY MS. FRANZETTI:

Q. Based on the 2001 to 2007 fish data, would you agree that there are only a few species most of which are tolerant that are thriving in the CAWS?

A. Yes, that's true.

Q. D, you agree that on the whole, the quality of the fish community in most of the CAWS is at best fair and often poor?

A. Yes, the IBI's indicate that the fish community is poorer to fair.

MS. WILLIAMS: Can I ask a quick follow up? When answering Ms. Franzetti's questions about most of the species being tolerant, when you're talking about most of the species being tolerant in response to Ms. Franzetti's questions, are you classifying large mouth bass as tolerant in your answers? Because earlier when I asked you, you did say you thought it was moderately tolerant, correct?

THE WITNESS: Yes, using the IEPA convention it would be moderately tolerant. I think that in the Limnotech report their reference

said it was tolerant, but the top five.

MR. ANDES: I think that answered the question.

MS. WILLIAMS: When you answer about what the tolerant -- that's fine.

MR. ANDES: To clarify.

MS. WILLIAMS: It's not your personal opinion about where they should be placed? You're answering with regard to how Limnotech classified them in the Habitat Evaluation Report, correct?

THE WITNESS: Well, question A she actually -- you asked the top five collected.

MS. WILLIAMS: Yes.

THE WITNESS: So that didn't include large mouth, I believe. And then B counsel said seven of the top nine were tolerant and the remaining two were moderately tolerant.

MS. WILLIAMS: What about C?

MS. FRANZETTI: Again, counsel, just in fairness, C says most of which are tolerant.

MS. WILLIAMS: That is what my question was focused on. When you're answering her question about most which are tolerant, are

you considering large mouth bass to be tolerant?

THE WITNESS: I don't think it effects my answer either way, but if the point is different literature classifies large mouth bass as moderately tolerant or tolerant? Yes, that's true.

MS. WILLIAMS: That's fine.

BY MS. FRANZETTI:

Q. Fifteen, is it your opinion that because it is not feasible to improve the existing habitat attributes to ones that have positive effects on fish metrics, the fish species that are currently present in the CAWS are basically the fish species that the CAWS can attain regardless of whether you make the water quality standards more stringent?

A. Yes, it's the basis for the District's proposal.

Q. And the last question. Almost last question because I do want to pick up -- I'm going to hold to this and go back to -- I asked Dr. Mackey and he deferred to you with respect to the District's descriptions of categories one and two appear to use some of the same nomenclature as

Ohio's EPA uses in its use classification system and by that I'm referring to Ohio EPA's class called modified warm water aquatic life waters and also its class called limited warm water aquatic life waters. Did you intend for your categories one and two to somewhat mirror the modified and limited use categories under Ohio's system?

A. No, that was merely a coincidence or a lack of creativity on our part.

Q. Then, I'll go back to my last pre-filed question, 16. Why do you think the District's proposed use classifications are better than those proposed by the Illinois EPA?

A. The District believes they're better because in large part use a CAWS specific habitat index. We include a third tier that acknowledges that there's stagnant waterbodies in the system. We've included a wet weather limited use that acknowledges the wet weather conditions in the CAWS pre-carp completion and we consider sediment toxicity to the extent we were able to.

Q. Okay.

MS. WILLIAMS: Can I ask a follow up, Susan?

MS. FRANZETTI: Yes.

MS. WILLIAMS: Let's set aside the category three, the wet weather limited use, but just focusing on category one and category two. Can you maybe summarize for the Board really what is the difference between category one and the Agency's use A and category two and the Agency's use B as far as how they're being used?

THE WITNESS: If you excluded all of the other things you just mentioned, I would say they're fairly similar. I believe the reaches that were different -- I have to consult a table.

MS. WILLIAMS: I even met to set that aside. So set aside even the fact that the District assigned some reaches different. Could you have taken some reaches and said we think instead of A these should go in B and we think instead of B this should be A, otherwise, what is the difference?

MR. ANDES: Other than all the differences?

MS. WILLIAMS: I mean, we have a definition, that we proposed a definition. I haven't necessarily seen your definition. So how

does your definition differ from what is in your proposal for one and two?

THE WITNESS: I would say they are similar although we had the knowledge of the large habitat study in the CAWS so that we would identify specific attributes so I think it's a little bit more detailed, but excluding all of the other issues that you have stated, I would say it is similar.

Q. Thanks.

MS. FRANZETTI: Thank you, Ms. Wasik. I have no more questions.

MS. TIPSORD: Mr. Harley, you have a follow up?

MR. HARLEY: I want to go back briefly to your answer to 14(b) in which you indicated 90 percent of all fish collected are tolerant or moderately tolerant. Does that mean ten percent of the fish that were collected were moderately intolerant or intolerant?

THE WITNESS: I think ten percent then would be either considered moderately intolerant or I think very few of them were intolerant. There's a table or a figure actually

2-6 on page 12 of Appendix A of the Habitat Evaluation Report that has the specific total number of individuals collected '01 through '07.

MR. HARLEY: In addition to small mouth bass, what were some of the other common -- more common moderately intolerant or intolerant species that make up that ten percent?

A. Well, in those seven years, there was one rainbow trout, one coho salmon, eight chinook salmon, 25 spot tail shiners. I believe those are intolerant, 143 rock bass.

MR. ANDES: That's over what time period?

THE WITNESS: This is 2001 through 2007.

MR. ANDES: So eight years?

THE WITNESS: Eight -- seven.

MR. ANDES: Seven years. Okay.

MS. FRANZETTI: And you went to Harvard Law School?

MR. ANDES: It wasn't math school.

THE WITNESS: I think there's black buffalo. There's eighteen black buffalo selected. Those are right near the lake and I think those

are intolerant. So the abundance -- the relative abundance here compared to the tolerant species is very low.

MR. HARLEY: And that reflects the results of the direct electrofishing over that period of time?

THE WITNESS: Yes, the District I believe has the most comprehensive fish database for the CAWS.

MR. HARLEY: It does not reflect, for example, the results of inventories after rotenone application more recently?

THE WITNESS: No, that doesn't. This predated the rotenone event.

MR. HARLEY: Thank you.

MS. TIPSORD: Ms. Liu?

MS. LIU: Ms. Wasik, I have a question as a follow up to Ms. Franzetti's question 16 on the District's proposed use classification. I was wondering is the District planning to propose water quality standards for any of the parameters in this rulemaking to go along with the ultimate proposed use designations?

THE WITNESS: Dissolved oxygen is

the only parameter where we have a different standard proposed for category one versus category two waters. There are a few other chemical water quality constituents to which the District disagrees with the Agency proposal that I've outlined in my testimony. They wouldn't differ by the category.

MS. LIU: Based on the District's Habitat Evaluation Report, do you know if Midwest Generation is planning to propose any alternate water quality standards as well?

THE WITNESS: I don't know.

MS. LIU: Thank you.

MR. ANDES: We can let them answer.

MS. FRANZETTI: We weren't -- let me answer as best I can and I feel confident doing so without my client sitting here. With respect to Subdocket C, we were not going to propose any numeric water quality standards because our understanding is that comes in Subdocket D, but when we get to Subdocket D we will be proposing alternative thermal water quality standards.

I don't know that we will be proposing alternatives on any other parameters.

It may only be limited to the thermal water quality standards. Does that help you?

MS. LIU: To the extent the rulemakings are interrelated to get a big picture prospective, it was helpful to hear that. Thank you.

MS. FRANZETTI: You're welcome.

MR. ETTINGER: I believe we may be proposing alternative thermal standards also which probably won't look like Ms. Franzetti's.

MS. FRANZETTI: Albert, in D as in dog?

MR. ETTINGER: Yes, I assumed and we'll get to that. We're going to ask Ms. Tipsord about that because some of the questions I had seemed to go to D, specifically the proposal on cyanide criteria and zinc criteria and do you want us to do that now or later because that's the sort of thing that I thought fit into D rather than C?

MS. TIPSORD: You mean as far as your pre-filed questions to Ms. Wasik now?

MR. ETTINGER: Yes.

MS. TIPSORD: I would say to the extent that Ms. Wasik's testimony was filed in

Subdocket C you should ask her questions while you have her here and if we feel some of this needs to be moved to D or some of this can be crossed referenced into D we can certainly do that.

MR. ETTINGER: Then we might offer testimony in D as to some of these points.

MS. TIPSORD: Okay.

MS. FRANZETTI: And you're not -- he is not prevented from doing this?

MS. TIPSORD: Correct. Absolutely.

MR. ETTINGER: I guess coming at it from a slightly different angle.

MS. FRANZETTI: I'm in agreement with you.

MR. ETTINGER: I think Ms. Franzetti and I agree that we thought the criteria proposals fit into D which is why we held our fire onto proposing alternative criteria.

MS. FRANZETTI: I agree with that.

MR. ANDES: Can we take a short break?

MS. TIPSORD: Yes. Let's take ten minutes.

(Whereupon, a break was taken after which the following proceedings were had.)

MS. TIPSORD: Let's go back on the record.

E X A M I N A T I O N

BY MR. ETTINGER

Q. Does the Metropolitan Water Reclamation District of Chicago currently operate aeration equipment?

A. Yes.

Q. Are those the SEPA stations?

A. We have SEPA stations one through five and also side stream supplemental aeration stations at Devon and Webster Avenue in the North Branch.

Q. Devon and Webster and the SEPA stations are in the Cal-Sag?

A. Calumet area. The Cal-Sag Channel and the Calumet River, the Little Calumet River.

Q. What purpose do those things serve?

A. They aerate the water in the channel.

Q. Do they serve any other purpose?

A. That's their main purpose.

Q. As part of this proposal, does the District propose to turn those machines off?

A. No.

Q. Why not?

A. I'm not sure how that would fit into our proposal.

Q. Well, I thought you proved that dissolved oxygen doesn't matter here so why are we spending money to put oxygen in the water?

A. The Limnotech report was looking at current conditions in the last several years and during those years the supplemental aeration stations were running.

Q. But you think something bad would happen if we turned them off?

A. I'm not sure.

Q. You're not sure?

A. I'm not sure what the levels would be if we didn't run those stations.

Q. But you are sure if we put in more stations it wouldn't help anything?

A. If you put in more stations and increase the dissolved oxygen further than current

conditions, it wouldn't be likely to help the current fish community because they're more limited by the habitat.

Q. But if we turned off any of the stations, it wouldn't -- it would potentially hurt the station? The fish --

A. I can't say that I've studied if we didn't run any of our aeration stations.

Q. Do you think the District has hit the sweet spot on dissolved oxygen and we can't improve it in any direction one way or the other?

A. I think if you were to shut the aeration stations off in the summer you'd get down to levels of dissolved oxygen that weren't present in the years that the Limnotech team studied.

Q. Now, in this proposal, are you writing into the proposal that the District has to continue to operate its aeration stations?

A. I don't believe that was currently written in my testimony, but that was the plan -- our plan is to continue to operate the stations.

Q. Is there going to be -- helping the guys who are drafting this rule, how are they going to draft the rule to make sure you don't

turn off the SEPA station?

A. I believe there will be operational controls in effect as part of the wet weather limited use language and that could include aeration stations.

Q. So that would go into the wet weather provisions of the rule that the board is supposed to write to incorporate your proposal?

A. Or it could also be included in the category three for stagnant waterbodies. We have never proposed to somehow decrease the water quality in the CAWS upon this rulemaking.

Q. Well, we haven't, but if we don't write in the rules so that you can't, a future board could decide to do so?

A. There are dissolved oxygen standards that we are proposing to meet the aquatic life uses. If it happens that we have to run our existing aeration stations or look at new aeration stations in certain areas as we've, I think, done certain feasibility studies to look at then we will continue to do that.

Q. What if you don't?

A. What if we don't do --

Q. What if for some portion of the year in some places you don't need to run the stations to meet the proposed DO standards?

A. We already don't always run every station. I guess I don't understand your question.

Q. My question is how are we to know the dissolved oxygen levels won't significantly go down if you decide to fine tune your operation of the stations to just meet the standards that you're writing into now as opposed to the standards that it's currently reaching?

MR. ANDES: I think when Mr. Zenz comes up he will talk about the plan that's been developed in terms of what would need to be operated in order to comply with the standards being proposed by the District including additional stations beyond those that are already existing.

MR. ETTINGER: So you don't think the existing stations were a waste of money, but new -- some new stations might be called upon to meet your proposal and we're going to hear about that from Mr. Zenz?

MR. ANDES: You're going to hear about the District's compliance plan from Mr. Zenz, yes.

MR. ETTINGER: The compliance plan is going to be written into the rules or you'll come up with a compliance plan and you know that's what is going to be -- that will meet the standard that the Board is going to write?

MR. ANDES: Why don't we wait until Mr. Zenz gets up here.

MR. ETTINGER: Okay.

BY MR. ETTINGER:

Q. My first pre-filed question is what is meant in footnote one of your testimony that the MWRD proposal is subject to the approval by the Board's District of Commissioners?

A. Just that expenditures to meet our water quality proposal are subject to our Board approval just like any other large expenditures.

Q. Has the Board approved this proposal?

A. No, not currently.

Q. Page nine of your testimony you discuss Bubbly Creek, the Collateral Channel and

other off channel slips. Are you aware of proposals that were developed to establish prairies in shallow aquatic areas in Bubbly Creek, the Collateral Channel and South Branch slips?

A. I was on a committee that was involved in the Bubbly Creek capping demonstration. It wasn't habitat restoration, per se. It was just looking at various kinds of active capping measures to put in the South Branch turning basin at the mouth of Bubbly Creek.

We were working with the City of Chicago and the Corps of Engineers. I think I've been attending those meetings for somewhere in the order of six years and I think they've rather stalled out because of funding issues from the city. They needed to come up with matching funds to the federal dollars and I think they're having a hard time doing that.

Q. What exactly is the point of that proposal?

A. It's to look at -- it's a demonstration project to look at sediment remediation in that area of Bubbly Creek and on

top of the sediment cap they were going to construct a small wetland area and make it sort of a teaching area with walkways.

Q. But that proposal is -- or that concept is stalled out as a result of funding from the city?

A. Yes, it's been cutback. I think they still -- the Department of Environment would still like to do it. I think they're just needing funding to move forward.

Q. How much funding would it be roughly?

A. I would have to check. I don't remember what the matching funds were from the city.

Q. Okay. Are you aware of any other proposals to put wetlands anywhere in the system?

A. The Water Reclamation District also worked with the Wetlands Initiative to do a similar project on the Collateral Channel. I think it was less than an acre at the end of the Collateral Channel which is off the Chicago Sanitary and Ship Canal to put in an active cap.

I don't know if that actually

included a wetland on top of a cap or not. I'm not as familiar with that project, but I believe that they're not going forward with it at this time.

Q. Do you know why not?

A. I think it was also a funding issue.

Q. Do you know whether the funding could have caused widespread economic dislocation within the Chicago area?

A. No, I don't know that.

Q. I'm not going to really have any questions of Ms. Wasik about these given her prior testimony, but I might as well throw them into the record so we know what we're talking about. I'd like to mark as whatever exhibit this is a portion of -- what number are we up to?

MS. TIPSORD: 462.

MR. ETTINGER: A portion of a document that was authored by the Wetlands Initiative that was sent to me by the US Corps of Engineers pursuant to a Freedom of Information Act request and I'm just giving those to you because I don't really have any questions given Ms. Wasik's testimony.

MS. TIPSORD: I've been handed a document that is -- the cover sheet is a letter from Kevin J. Jervi, J-E-R-V-I, Assistant District Counsel, Chicago District US Army Corps of Engineers to Albert Ettinger dated April 4th, 2001 -- 2011. If there's no objection, we will admit this as Exhibit 462. Seeing none, it's Exhibit 462.

(Document marked as ILPCB Exhibit No. 462 for identification.)

BY MR. ETTINGER:

Q. I'm sorry. I just handed those out because it was a nice time to distribute them, but, like I said, given your prior testimony, I'm not going to ask you the details of the proposal you haven't seen before. I was going to ask you, though, however, whether to your knowledge you or anyone else at the District made Limnotech aware of proposals like that or other proposals to put in wetlands and abatements in downtown Chicago?

A. Maybe as a matter of discussion we talked about the sediment capping in Bubbly Creek, but we did not make them aware for purposes of

their project because I didn't see it relevant. It wasn't a restoration project. It was sediment capping as I said.

Q. I'm sorry. That sediment capping project my question was broader. Obviously, if you didn't think that project was relevant you didn't tell them about it, but, to your knowledge, did you or anyone else make Limnotech aware of any of these proposals of constructive wetlands in downtown Chicago?

MR. ANDES: What proposal? We have a series of slides? I'm not sure I see a proposal.

BY MR. ETTINGER:

Q. My question was really quite broad and I ask you to put that document away and quit looking at it. My question was, did you or anyone else at the Metropolitan Water Reclamation District make Limnotech aware of any proposal whether it appears on that piece of paper or not for wetlands rehabilitation projects in downtown Chicago?

A. No.

Q. Thank you. On page 12 of your

testimony, you state the testimony provided by the District based on continuous monitoring data throughout the system show that diurnal DO fluctuation rarely occurs in these deep draft waters. What testimony?

A. Sam Dennison's 2008 pre-filed testimony discusses dissolved oxygen.

Q. Which are the deep draft waters?

A. The CAWS is considered deep draft, I would say except for Bubbly Creek and the Grand Calumet River.

Q. Are there areas within the CAWS that -- are there areas within the CAWS that have diurnal swings?

A. Out of our 30 continuous dissolved oxygen monitoring stations, basically only -- the only diurnal dissolved oxygen fluctuation of a large magnitude or that seems to be caused by photosynthesis was at 36th Street at Bubbly Creek, Main Street on the North Shore Channel and to a lower magnitude occasionally at Halsted in the Little Calumet River because this is a shallower area.

Q. Why do diurnal swings rarely occur

in much of the CAWS?

A. A number of factors. The turbidity, the depth in the CAWS, the lack of substantial aquatic vegetation, the low algae values. Diurnal fluctuations are caused when chlorophyll aquatic vegetation is producing algae or is producing dissolved oxygen during the day and at night when it's no longer photosynthesizing it's perspiring and consuming dissolved oxygen. So you'll get these really nice characteristic signatures, dissolved oxygen patterns that occur day and night when they refer to them as diurnal DO fluctuations.

Q. And turbidity is such that it prevents the sunlight from penetrating the water deeply enough to get to any plants?

A. In some areas, turbidity may be such that the water can't penetrate very low into the waterway and if it's a deep waterway the same issue may apply.

Q. I think we both misspoke there. So let me try again. The turbidity stops the sunlight from penetrating far enough so there will be plants that would cause this swing?

A. Plants specifically or algae?

Q. Plants or algae, dystonic algae or macrophytes?

A. There is algae in the CAWS. There is phytoplankton or in stream algae in the CAWS. It's just generally not a very high value because of possibly the turbidity and there are other reasons.

Q. I'm sorry. What other reasons are there?

A. For instance, as you know, the CAWS is effluent dominated and downstream of the water reclamation plants. The effluent is largely free of algae. So we have very low algae concentrations.

Q. You have a lot of standing water though which normally you would think would breed algae and certainly it does in other sorts of impounded waters?

A. Well, downstream -- as you move further downstream, the algae will increase in the water column, but directly downstream at the stations closest to the Water Reclamation District discharges have very low algae and also low

turbidity compared to the rest of the system.

Q. The turbidity is not coming from the sewerage treatment plants generally?

A. Our data indicates that turbidity is lower directly downstream of the treatment plants.

Q. The treatment plants are meeting a fertile result?

A. Right.

Q. The ESS, not TSS standard, right, or whatever it is?

A. Yes, they are meeting and the total suspended solids are very low downstream.

Q. So total suspended solids are low immediately downstream of the sewage treatment plants so there's some other source of the turbidity in the system?

A. Yes. Do you want to know more about that?

Q. Yes. I thirst for knowledge.

A. The fine sediments in the CAWS because of their resuspension can cause a lot of turbidity in the CAWS and further down in the Illinois River you will notice the turbidity is quite high, too. There's a lot of suspended

sediment and resuspension.

Q. And how did the sediment get there?

A. There's legacy sediments in the CAWS. Silky settlements as Scudder has testified these channels weren't created by natural trivial processes. So there is sediment deposition in a straight channel that you don't see on normal sedimentation processes.

Q. On page 14 of your testimony, you state that fish kills do not occur except under extremely worrisome circumstances. Do some fish kills go unobserved?

A. I don't know.

Q. Okay.

MR. ANDES: If they're unobserved.

BY MR. ETTINGER:

Q. Is it the intent of the MWRD proposal to allow it to create circumstances which will make legal the rare fish kills that do now occur?

A. No, if fish kills -- basically, the current proposal as I mentioned before does nothing that would increase the amount of fish kills or decrease the water quality in the CAWS so

there's no reason to expect that we'd have additional fish kills.

Q. But there are some fish kills now?

A. Yes, very occasionally. I think in Adrienne Nemura's testimony she points out when there's antecedent conditions of 90 to 100 degree days and then one or more wet weather events in a row that are of significance, duration or magnitude that's when you are most likely to have a fish kill.

Q. Do you know when those events will occur in the feature?

A. Probably.

MR. ANDES: How often do they occur?

THE WITNESS: I know that we've submitted our fish kill reports for the past ten years to the Board. I don't recall what exhibit number it is, but they are rare. I believe the last reported fish kill we had in the CAWS was in 2008 and that was an example of we had two 100 degree days followed by a series of rain events and the North Branch Chicago River had a fish kill.

BY MR. ETTINGER:

Q. Now, the dissolved oxygen levels which are causing those fish kills now are currently a violation of the water quality standards, aren't they?

A. I'm not sure to what extent we've concluded the causes of various fish kills.

Q. The fish kills that we're seeing now are occurring in conditions in which dissolved oxygen levels are below four mg/L, aren't they?

A. It's possible if the DO was less than four, then it would have been a violation of the water quality standard.

Q. But under your proposal, a fish kill caused by zero mg/L of dissolved oxygen would be legal as long as it occurred under these circumstances that we talked about here?

A. No, I think we envision there being certain criteria for the wet weather limited use to a narrative criteria that states that the levels of DO shouldn't contribute to a fish kill.

Q. So this --

A. It would harm the resident biota or something to that effect.

Q. So this is an additional provision in the water quality standard that the Board is proposing?

A. Yes, I think.

Q. I'm sorry. The MWRD is proposing that the Board write?

A. I would object to that characterization. There would be a narrative -- a description of narrative criteria in the wet weather limited use.

Q. So we've got your dissolved oxygen numbers and then you've got wet weather and wet weather exemptions to your dissolved oxygen levels proposal and then on top of that there will be a narrative standard against fish kills or effect on aquatic life?

A. Yes, for just that reason. We would have in that wet weather limited use some sort of narrative that described what kind of operational responsibilities the District would have when the wet weather limited use was triggered and any other requirements such as something similar to what is in the general use standard for stagnant waterbodies which doesn't have a numerical

criteria for DO, but it says something to the effect that dissolved oxygen won't be such that resident biota is harmed.

Q. So -- I'm sorry. That's an existing narrative standard? Are you going to leave the existing narrative standard in place?

A. That's an existing narrative standard in the general use waterbodies. I just used it as an example.

Q. I believe there's an existing narrative standard in the secondary treatment secondary contact waters, too?

A. For stagnant waters, I don't recall, but, no, this would be different because it would be under the wet weather limited use language.

Q. I'm trying to -- where in your or Ms. Nemura's testimony is the District's proposal described in sufficient detail so that I can understand how this proposed narrative criteria fits in with your proposed dissolved oxygen criteria?

MR. ANDES: The wet weather provisions are discussed in detail in Ms. Nemura's testimony.

BY MR. ETTINGER:

Q. Does she also discuss this narrative standard -- I'm sorry. I missed --

MR. ANDES: I don't recall.

MR. ETTINGER: You don't recall.

MS. LIU: Mr. Ettinger, may I follow up on your line of questions?

MR. ETTINGER: You're the one that has to do the work. You better follow up.

MS. LIU: As an alternative to perhaps this wet weather limited use subcategory that you're proposing, would the District be willing to look at a way to include that instead of in the criteria instead of in the use categories?

THE WITNESS: I think that under the current conditions because after certain rain events there is a period of time, sometimes very short, where parts of the CAWS a slug of water moves through the CAWS that causes DO to be at zero. I don't know that the standards could adequately -- I don't know that we could propose a DO standard that would adequately protect for that issue in the CAWS if that makes sense.

MS. TIPSORD: Can I ask a question? If there are times when a CSO event results in dissolved oxygen at zero occurred currently, which I assume they do occur currently, would that be a correct assumption? Are there CSO --

THE WITNESS: After wet weather, there are conditions of zero mg/L DO in the CAWS. I would say it moves through the system. It doesn't hit the system all at once. So I think there's a lot of voidance of the fish at this point of those conditions.

MS. TIPSORD: So I guess because I'm just a lawyer, I'm not a scientist, I'm a little confused as to how you develop -- how you change an aquatic life use for a temporary situation and I guess my question is currently we have aquatic life uses existing in the CAWS which under the UAA we have to protect existing uses at a minimum under the Clean Water Act.

So I guess my question is do you think that the current secondary contact uses are actually being achieved and what would you say the current aquatic life use is during one of those wet weather events?

THE WITNESS: As to specific questions I guess about the wet weather limited use and how it fits into aquatic life uses I think Adrienne is the better person to answer that, but I will say I believe that the situation now is such that a wet weather limited use, I guess, is required in the CAWS in order to reflect the conditions -- the pre-TARP conditions in terms of your question of how is that incorporated or how is that reflected in aquatic life uses I think it would be handled similarly to the way that some communities have handled the recreational use issues for temporary conditions when there's wet weather. They will suspend bacterial water standards. I think it would be handled in a similar way.

MS. TIPSORD: I guess my thing is it's real easy to tell people not to recreate after a CSO. It's not as easy to tell a fish not to swim after a CSO and I think that's where I'm having the -- Alisa and I talked a little bit about this at break. I'm having a hard time conceptualizing how you create an aquatic life use for a temporary situation and I can't equate --

personally, I can't equate it again. And, again, I'm just the lawyer and not the scientist. I can't equate it with the recreational use where you might say because of the CSO event there's nothing we can do to keep your pathogens from rising this high so don't recreate for 24 hours after a CSO event. I can understand how you can do that, but I don't know how you can tell a fish to avoid this area?

THE WITNESS: You don't have to tell the fish to avoid it because they have controls in their body to avoid areas of low DO as I've discussed in some of my attachments to my testimony. There's a lot of evidence that fish will avoid areas of -- anoxic areas or areas that are below, for instance, two mg/L of dissolved oxygen. They'll move to an area with higher DO which is why it's important I think this doesn't hit the CAWS system all at once.

There would be areas of refuge and clearly there are currently areas of refuge, DO refuge for fish because as I've pointed out, we really don't have frequent fish kills except under these particular conditions. So I think that the

fish are moving out of anoxic zones in the CAWS and, in fact, we've just depleted a first year -- the first year of a two year study with the Water Environment Research Foundation and also Limnotech looking at how wet weather conditions effect fish, particularly large mouth bass and carp, in the CAWS and in the Bubbly Creek area.

Using radio transmitters, we have tagged several large mouth bass and we're also working with some of the carp that have been tagged with the Army Corps of Engineers for their Asian carp study. To determine -- and using our continuous dissolved oxygen monitoring in the area to determine where these fish are going exactly when the DO levels get low. But as to a specific answer to your question, I do think Adrienne would be able to handle that more articulately.

MS. TIPSORD: You helped me out a lot. Thank you.

THE WITNESS: All right.

MS. LIU: I'm sorry. Just to clarify. So if you don't have the wet weather limited use subcategory, but you do have a wet weather DO criteria of zero, that would not be

protective of an aquatic life use that wasn't for wet weather?

THE WITNESS: I think we want to acknowledge the wet weather conditions as a temporary and fleeting condition in the CAWS whereas the general minimum criteria we believe should be higher in order to protect aquatic life. We're not suggesting that zero all the time will protect aquatic life in the CAWS by any means.

MS. LIU: Thank you.

BY MR. ETTINGER:

Q. I'm going to skip down to kind of tie up some of these points we just dealt with. This is under my criteria questions. Eight, has US EPA ever approved a state standard that allowed DO levels to fall below 1.5 milligrams for liter?

A. This is your number eight?

Q. On the second set. I am on the second set. I wasn't clear on how we were going to handle Subdocket C and D so I broke them up.

A. EPA has a deficit of 1.0 instantaneous minimum for June through September for use two seasonal deep draft refuge. It's described on page nine of my attachment two.

Q. So they approved down to one and in the deep draft area in Chesapeake Bay --

A. They issued.

Q. I'm sorry. They did what?

A. They have a use two seasonal deep channel refuge subcategory that's part of their regulations with the dissolved oxygen criteria of 1.0 mg/L with instantaneous minimum and that is June 1st through September 30th.

Q. Do you know how long you're allowed to hold it at that instantaneous minimum?

A. Let me just check my attachment here. It doesn't look like there's a time that you can exceed.

Q. We'll check on that. Are you aware of any place where US EPA has allowed an instantaneous below one mg/L?

A. Not that I know of.

Q. Are there forms of aquatic life that cannot swim away from low oxygen conditions?

A. Benthic invertebrates can't necessarily swim away although I don't know if the invertebrates that we generally find in the CAWS would be sensitive to occasional periodic DO dips.

I know that they are generally buried in fine sediments. So the DO in those fine sediments is quite low anyway. So the DO in the water column might be the least of their worries.

Q. Are there any native mussels in the CAWS?

A. Not that we've ever found. I never found any data indicating that or native fresh water mussels in the CAWS reaches.

Q. Are native mussels sensitive to low DO conditions?

MR. ANDES: You mean fresh water?

BY MR. ETTINGER:

Q. Fresh water native mussels, are they sensitive to low dissolved oxygen conditions?

A. It depends on what mussel. I think they do vary quite a bit. I've seen studies considering low DO on muricidae mussels, but, like I said, I don't believe that they are present in the CAWS, but I think in general there's studies that have shown that sandshells are enlarged less. I'd say they're more tolerant to low DO than fish is in general. So I think our consideration of fish is --

Q. Have we discussed whether there would be mussels in the CAWS when there are periodically crashes on dissolved oxygen levels?

A. I would find that highly doubtful given their habitat requirements.

Q. Are there mussels in the North Branch of the Chicago River?

A. Yes, we do find some more tolerant muricidae mussels.

Q. But are there any below the dam at the confluence of the North Shore Channel in the North Branch of the Chicago River?

A. No. I believe because of habitat they are not.

Q. There is no mussel habitat, in your opinion, anywhere in the CAWS?

A. I think because of the fine sediments they are pretty rare even in the shallow portions of the North Branch as you mentioned. I don't have my mussel data with me, but we found them in the west fork of the west branch, but we generally just find giant floaters and heel splitters, some of the more tolerant muricidae. We don't find a lot of live ones.

Q. Do you know what the dissolved oxygen requirements are of heel splitters?

A. Not offhand, no.

Q. Do they require any dissolved oxygen?

A. Probably.

Q. Probably. Have you or anyone else, to your knowledge, discussed the proposed wet weather criteria with US EPA? If so, what did they say?

A. No, I did not.

Q. Okay. I don't want to belabor this, but you say it's not feasible to eliminate or capture the wet weather sources in the foreseeable feature. What is your basis for that statement?

A. Is this a pre-filed question?

Q. It is. It is ten. We're back to my first list here.

A. Basically what I meant by this is we did -- the District did look at unsafe CSO treatments and explored and is going to be discussed by Mr. Zenz. It was explored and is considered infeasible.

Q. Why is it infeasible?

A. Well, I think Mr. Zenz could explain that more thoroughly.

Q. I'll withdraw the question.

A. I'd like to answer it.

Q. Okay.

A. The study concludes that the end of pipe treatment of 170 CSO outfalls that they looked at in the study area which included the North Shore Channel of the North Branch and the South Branch of the Chicago River was impossible without, quote, demolition of large multistory buildings or relation of major road --

MR. ANDES: Relocation?

BY THE WITNESS:

A. Relocation. Sorry. And to provide end of pipe treatment for 105 sites that they specified which do have available land for installing a treatment facility. The cost -- the total capital expenditure was determined to be $893 million and having a continual annual cost of nearly $3.8 million and that's in 2005 dollars because this report is a few years old.

BY MR. ETTINGER:

Q. Interest rates don't matter to the

Metropolitan Water Reclamation District. Is $890 million, is that infeasible?

A. I don't know.

Q. Okay. Could we do a few of them?

A. I am not sure what doing a few of them would do for the aquatic life, but I suppose you could look at that.

Q. Is the only bad thing that happens from a CSO is its effect on dissolved oxygen levels?

A. There is probably increased bacterial -- indicator bacteria downstream of CSO's --

Q. Don't they kind of stink, too?

A. I don't know. Maybe I'm immune to that.

Q. You might have been on the channel too much.

MR. ANDES: Let me follow up a little bit. In the report you're referring to, does it also say that 65 of the 170 there was simply no place to put system treatments at all?

THE WITNESS: Yes, that was one of the conclusions.

MR. ANDES: If you addressed a few of these 170 CSO's, do you think that would make any significant difference in any of these?

THE WITNESS: No, I don't believe so.

BY MR. ETTINGER:

Q. Do all of the CSO's effect the entire system?

A. No, they would be localized.

Q. Right. So if you fixed one or two of them, would you not potentially have some localized benefits?

A. Potentially. I haven't looked at that.

Q. And there's nothing about fixing a CSO -- I'm being sloppy. There's treating CSO is what we're talking about here. They're also creating fixing the CSO in the sense that it's not a CSO anymore. Have you looked at -- let's start with we've been talking about treating CSO's, right?

A. I think so.

Q. So we continue to have the combined sewer overflow, but we're treating it so it

contains less pollutants, that's what we're talking about, right?

A. That was the basis for the report that I have just quoted in my testimony although that was regarding bacterial water quality, not even touching dissolved oxygen.

Q. This is all from Mr. Zenz's report or is this a different report?

A. No, it's from Mr. Zenz's report. I'm just saying that this cost is simply reflecting this study that he did which focused, I believe, on bacterial water quality standards. It didn't even cover dissolved oxygen. So I would think the number is actually conservative. It doesn't necessarily go into improving DO.

Q. You're not a treatment engineer, are you?

A. No, that's why I think you should ask Mr. Zenz some of these questions.

Q. I offered to withdraw the question earlier, but you boldly wanted to move forward. To your knowledge, as a biologist, did the CSO take pollutants in addition to biological -- I'm sorry -- biological oxygen demand?

A. It's possible that they do.

Q. Do they have metals?

A. I don't have any data in front of me. I don't know how dilute the various -- it probably depends on the location and the storm event. I know storm water runoff has metals and CSO may as well.

Q. So are there -- okay. So, you know, whether -- stay away from the treatment questions, Albert. Is there anything that you know of as to why we would have to treat all of the CSO's to treat any of them?

A. From a bacterial standpoint, I guess we're looking at a comprehensive solution not looking at individual CSO's.

Q. I don't know why you would do it any other way, but we don't need to discuss that. We'll go on.

A. But, potentially, I suppose you could look at the feasibility of -- the feasibility of -- the feasibility -- I would hope also the benefit that would be associated with treating certain CSO's.

MR. ANDES: If you were looking to

comply with some water quality standard for bacteria or for dissolved oxygen throughout the system and comply all the time throughout all the reaches, wouldn't you want to address all of the CSO's that are contributing or potentially contributing pollutants?

THE WITNESS: Right. From that standpoint, that's a good point.

BY MR. ETTINGER:

Q. This has gotten a little theoretical here.

MR. ANDES: Just now?

MR. ETTINGER: Yes. Let me see if we have anything else here.

BY MR. ETTINGER:

Q. Let's skip the rest of the SSO and CSO questions because Mr. Zenz, who is very swell and young, is going to be addressing those questions and I will be asking directly those questions.

MR. ANDES: Flattery isn't going to help much.

MR. ETTINGER: You don't know.

BY MR. ETTINGER:

Q. I'd like to talk about the cyanide criteria now. What is your scientific basis for the proposed cyanide criteria that has been placed in the record in this proceeding?

A. The scientific basis for our proposal on cyanide is the same basis as for most of the other general use waterways of Cook County that have a site specific cyanide standard. These waterways in Cook County would not be expected to meet the general use water quality standard for cyanide because they aren't expected to support the cool water species that were evaluated to come up with that general use standard.

For instance, that was the rainbow trout, which is a cool water species that isn't present in the CAWS. It wouldn't potentially establish a population in the CAWS. So, basically, we dropped that species from the evaluation and then instead of 5.2 mg/L, it would be 10 mg/L which is what the standard is for cyanide in most other Cook County general use waterways.

Q. Have you studied whether there are

any synergistic effects of low dissolved oxygen levels and cyanide in terms of cyanide toxicities?

A. I have not studied that.

Q. Are you aware of any of the studies regarding toxicity in cyanide with regard to temperature?

A. No, I can't think of any that I'm familiar with.

Q. Have you given any thought whatsoever of the potential that high temperatures or low dissolved oxygen -- low dissolved oxygen might increase the toxicities of cyanide?

MR. ANDES: This is just hypothetical, correct?

MR. ETTINGER: These are all just hypothetical.

BY THE WITNESS:

A. I think the criteria we're proposing is basically we're using the US EPA water quality criteria documents for the protection of aquatic life. They use the most sensitive species to cyanide in order to come up with those numbers and we are basically saying that one of those numbers is not relevant because we don't have rainbow

trout and other than that it's the same as the US EPA criteria.

So if US EPA isn't considering DO and temperature, I suppose, no, we are not considering it either.

BY MR. ETTINGER:

Q. Right. We're not going to discuss philosophy. Did you look here as to whether there were any other species in the system that may be sensitive to cyanide?

A. The species that are most sensitive to cyanide according to the toxicity studies that were used in the US EPA criteria are all fish species. They looked at invertebrates and mussels and they found the most cyanide sensitive species were fish; rainbow trout, brook trout, yellow perch and bluegill.

We're simply removing the rainbow trout and adding the next most sensitive species which I believe was -- it was white suckers. So I think this is five of the species that are most sensitive to cyanide according to US EPA.

Q. Did the US EPA study any toxicities

of cyanide under conditions of low dissolved oxygen?

A. I don't know if US EPA did any studies, but they use literature, laboratory essays, and I would have to go back to the secondary and look at the secondary references to see what the DO and temperature conditions were under which they ran the laboratory essays.

Q. So you don't know?

A. Not offhand.

MR. GIRARD: Albert, can I ask a follow up along the lines?

MR. ETTINGER: Please do.

MR. GIRARD: I had a question when I was reading the testimony. Did you calculate what would happen if you dropped out brook trout and then added in the next most sensitive species after the black crappie?

THE WITNESS: Black crappie. That was the other one. I misspoke earlier. I said white sucker, but it was actually black crappie that was the next most sensitive fish.

MR. GIRARD: What comes after -- what is the next sensitive species on the list?

THE WITNESS: I'd have to look at the criteria here. It may take me a moment to find, but if you did calculate it it would definitely go down. I'm not sure by how much.

MR. GIRARD: In other words, instead of being 9.8 mg/L, it would be 9.9 or something higher, right?

THE WITNESS: Yes. I'm sorry. The standard if you were to take the next sensitive fish species instead of the brook trout which also might be a relevant comparison since we also don't have brook trout, you're right, the number would increase above 10 mg/L, although I'm not sure how much. I could easily do that calculation.

MR. GIRARD: I'm not asking you to do it right now, but maybe in comments after this you could do that or just give it to us.

THE WITNESS: Mm-hmm.

MR. GIRARD: Thank you.

THE WITNESS: I do note that the waterways in the CAWS at our ambient stations if you look at historical data would almost always meet a 10 mg/L standard.

BY MR. ETTINGER:

Q. Are you aware of any studies showing effects of cyanide in low concentrations on bluegill reproduction?

A. I'm only aware of the references, again, in the US EPA document and they did include bluegill. That was one of the essayed species so bluegill should be protected under their criteria as well.

Q. Now, the US EPA criteria are based on killing fish in a tank, right?

A. They have -- we're talking about chronic standards for cyanide. So, no. The end point wouldn't be death. The growth of --

Q. Do you have any independent studies regarding reproduction on the effects of cyanide on bluegill reproduction other than what was used in the US EPA criteria?

A. No, but I would say reproduction is one of the main end points in developing chronic criteria. So I believe that the US EPA would cover reproduction effects.

Q. You have much more faith in the US EPA than I do, which is surprising for a District

employee this week.

MR. ANDES: We're full of surprises.

BY MR. ETTINGER:

Q. Okay. I think I may be done, but I jumped around a little. Just one thing and I may be -- let me ask you. Has the District, to your knowledge, considered any sort of green infrastructure approaches to CSO's?

A. Yes. Let me just find my notes here. The storm water section of our engineering department is generally in charge of assessing green technologies and they have some ongoing projects that are exploring this and they also are responsible for implementing the storm water control ordinance.

The reduction of system-wide storm flow by green technologies I think is largely unknown in terms of how much flow can be reduced by a specific technology in a combined sewer area. That needs to be explored further. Currently, the District is working with the City of Chicago Department of Transportation and the USGS Streetscape Project to look at pervious pavements and investigate the impact of green

technologies on the reduction of storm flow into the system and also the District is conducting an experiment on storm water runoff on our plants in the parking lots with using three different types of permeable pavements. These studies are not complete yet and, to my knowledge, there's not a report on these projects yet.

Q. Have you thought of hiring Mr. Bell or someone like him to look at constructive wetlands to approach the CSO's?

A. I'm not sure if the District has looked at constructive wetlands in terms of CSO's. I know that there were feasibility studies. Again, they were run by our engineering department, but they were looking at the feasibility of getting some nutrient removal benefit from treatment wetlands near the Lockport area that was Lockport, Marsh and Centennial Trail and they ran into some regulatory issues with that.

MR. ETTINGER: I guess we're done.

MS. TIPSORD: Any other questions for Ms. Wasik? Thank you very much. We'll recess for the day and come back tomorrow morning.

STATE OF ILLINOIS)
) SS.
COUNTY OF COOK)

I, Steven Brickey, Certified Shorthand Reporter, do hereby certify that I reported in shorthand the proceedings had at the trial aforesaid, and that the foregoing is a true, complete and correct transcript of the proceedings of said trial as appears from my stenographic notes so taken and transcribed under my personal direction.

Witness my official signature in and for Cook County, Illinois, on this 27th day of May, A.D., 2010.

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