ORIGINAL

ILLINOIS POLLUTION CONTROL BOARD

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

REPORT OF PROCEEDINGS held in the above-entitled cause before Hearing Officer Marie Tipsord, called by the Illinois Pollution Control Board, taken before Laura Mukahirn, CSR, a notary public within and for the County of Cook and State of Illinois, at the Thompson Center, Chicago, Illinois, on the 14th day of January, 2010, commencing at the hour of 9:00 a.m.

A P P E A R A N C E S

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MR. TANNER GIRARD, Chairman
MR. ANAND RAO, Member
MS. ALISA LIU, Member
MS. ANDREA MOORE, Member
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HEARING OFFICER TIPSORD: I think we're ready to get started this morning. Good morning, everyone. My name is Marie Tipsord, and I've been appointed by the board to serve as hearing officer in this proceeding entitled Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines, proposed amendments to 35 code 301, 302, 303, and 304. This is Docket No. R08-9. With me today to my immediate right acting chairman G. Tanner Girard, the presiding board member. To his immediate right is board member Carry Zalewski and board member Andrea Moore will be joining us shortly. To my far left is board member Tom Johnson, to his immediate right is board member Gary Blankenship. To my immediate left is Anand Rao. And to his left is Alisa Liu, our technical unit. This is our 37th day of hearing, and it's our second day with Midwest Generation's final witness in this area Dr. Allen Burton. And we'll continue with questions for the testifier from the IEPA,

and then move on to the Environmental Law and Policy Center. Again, anyone may ask a follow-up question. You need not wait until your turn to ask a question. I do ask that you raise your hand, wait for me to acknowledge you. After I've acknowledged you, please state your name, who you represent before you begin your question. Speak one at a time. If you speak over each other, the court reporter will not be able to get your questions on the record. Please note that any questions asked by a board member or staff are intended to help build a complete record for the board's decision and not to express any preconceived notions or bias. I did ask that you check your schedule so that we can set up a time for a prehearing conference. We'll talk at break about a date that might work for that. Dr. Girard, anything this morning?

CHAIRMAN GIRARD: Good morning. Welcome to Hearing Day 37. Let's get to work. Thanks.

HEARING OFFICER TIPSORD: With that,

we'll go to the IEPA.

E X A M I N A T I O N

By Ms. Williams:

Q. Good morning Dr. Burton. I'm going to pick up with Question 69 on my prefiled questions on Page 70. Are you familiar with the 1997 U.S. EPA document entitled, quote, the incidents and severity of sediment contamination in surface waters of United States, which I'll refer to as ISSC?

A. Yes. I reviewed the first edition of this report while it was drafted. I don't know if any of my data was used in the report by the contractor Tetratech.

Q. Are you able to summarize the precautions ISSC discusses in relying on only sediment chemistry data to make conclusions about whether sediments are toxic to aquatic life?

A. No. But I assume they're just like the statements made in my weight of evidence publications and earlier citations. The more lines of evidence used in an assessment, the less uncertainty if they're done correctly. I stated earlier the sediment aquatic guidelines are showed to be accurate 70 to 75 percent of the time

predicting benthic toxicity. And the U.S. EPA designated tier 1 sites, areas where sediments are associated with adverse specs on aquatic life or human health are probable as being the most contaminated. But for those they had both chemistry and toxicity information. In addition, they also designated areas of probable concern where further investigations or remediation may be necessary due to the high degree of contamination and the high number of tier one sites. In the nation, 48 areas of probable concern were identified in this report, and the Kankakee, Chicago, Des Plaines, and Upper Illinois were on that list fully 95 to 98 percent of the stations measured in the Des Plaines and Chicago River were identified as tier 1 or tier 2 sites. The Ship Canal had 19 tier 1 sites and Des Plaines had 18 tier 1 sites.

Q. And did they suggest that the chemistry data appropriate for setting regulatory criteria sites specific clean-up standards or remediation goals?

A. I do not recall, but this is the norm for most sediment remediation efforts.

Q. What's the norm?

A. Using these for clean-ups as we discussed yesterday.

Q. Didn't you also discuss yesterday they weren't intended for that purpose but that they are used by project managers for that purpose?

A. Exactly.

Q. Okay.

A. Oh, yes. And I should also mention that this was discussed in a recent publication by Gus Gustafson that was published in Environmental Science and Technology in 2009.

Q. What was discussed?

A. Unfortunately I didn't include it on the CV.

Q. What was discussed, Dr. Burton?

A. The dredging of sites and the use of sediment quality guidelines.

Q. And the fact that they shouldn't be used for setting clean-up goals?

A. No. Just really that was the summary of a national research council report that I was part of that mainly just said what the state of the practice was.

Q. Do you agree with the state of the

practice?

A. Oh, no.

Q. I'm going to move on to Question -- the barge traffic questions. I think we've gone over a lot of this yesterday, so this should just be very brief. Question 70: Can you contrast and compare the potential effects of aquatic life of barge traffic in the Sanitary and Ship Canal with the potential barge traffic effects in the Brandon Pool and in the Upper Dresden Island Pool?

A. It's my understanding that the recent MWRD report by LimnoTech found a correlation between navigation and major impacts to aquatic life and Ship Canal. I can generally say that the effects on aquatic life barge traffic may be worse in the Ship Canal than in Brandon Pool and the Upper Des Plaines Island Pool due to the fact that it is a narrower stretch of water, thus less room for aquatic life to avoid the barge turbulence and solids. However, it's known that wave surges from boats and barges have an adverse effect on aquatic life and the shore line habitat. And those affect a wider area of the Upper Des Plaines.

Q. But you would agree generally that

fish have an easier time avoiding barge traffic in the Upper Dresden Island Pool than in the Sanitary Ship Canal?

A. Yes.

MR. ETTINGER: Excuse me. This is Albert Ettinger again. I represent a number of environmental groups. Could you explain a little more the effect of the wave surges on aquatic life and on other factors?

DR. BURTON: Well, the wave surge issue is a physical turbulence issue. So as the wave goes out, particularly through the shallower areas, it disturbs the fish behavior. So there have been studies that look at fish behavior and see that they avoid these areas where you have repeated boat traffic basically. And then when the -- that surge hits the bank, it creates swell erosion of the bank which then it creates siltation in the sediments which makes it poorer habitat.

MR. ETTINGER: Does it also have the effect of pushing pollutants in the side channels?

DR. BURTON: I haven't seen any studies that linked that to resuspension of sediments. So I'm unsure of that.

MR. ETTINGER: I'm sorry. If you had pollutants in the main channel, would they be driven by the wave action into the side channels?

DR. BURTON: It would probably be more by the resuspension from the prop which then the waves push out, yeah.

MR. ETTINGER: Thank you.

BY MS. WILLIAMS:

Q. Question 71: A asks what studies did you find and review on barge traffic effects?

A. Well, we submitted and discussed yesterday the Commonwealth Edison literature review report that I submitted. And, in addition, there's a wealth of literature on total suspended solids which I believe is the dominant barge effect; some of which I cite in the my book, CRC review, which was submitted. The U.S. EPA suspended embedded sediment criteria document that we discussed yesterday, and the review by Wood and Armitage which we discussed yesterday.

Q. Subpart C: What reduction in the level or frequency of barge traffic do you believe would be necessary to allow the Clean Water Act goal aquatic life uses to be attainable in the Upper Dresden Island Pool?

A. I do not know.

Q. Do other segments of the Illinois River and other rivers where barge traffic occurs have the ability to attain interim Clean Water Act aquatic life goal?

A. I do not know. I haven't studied the Illinois river's ability to retain Clean Water Act aquatic life goals.

Q. What about in other states?

A. I do not know.

Q. Okay. The next section of questions we've addressed some of the points, but -- so I'll probably be skipping around a bit. We're going to start with No. 75. You state on Page 5 that, quote, overlying water quality in some cases may be considered relatively good and may even minimally meet water quality standards. Did you conduct an evaluation of the water quality; and, if so, did the results of your evaluation differ from the CAWS or

Lower Des Plaines UAA studies?

A. I use the phrase may even minimally meet water quality standards to indicate that based on the water chemistry data collected in the UAA reports of the CAWS and the Lower Des Plaines, there are areas within these two study areas where the data generally indicates they're in compliance most of the time for water quality standards for general use in Illinois. Although there are others such as DO and temperature for which there is not. For purposes of my work for this testimony, I did not conduct my own evaluation of the water chemistry of the CAWS or the Lower Des Plaines.

Q. Thank you. Question 76: On Page 5 of Attachment 1 with regard to the Upper Dresden Island Pool, you state, quote, the dominant stressors include contaminated sediments, metals, synthetic organic chemicals including pesticides, PAHs, and pharmaceuticals and personal care products, nutrients, flow regime alteration, and degraded habitats.

A: Are these listed in order of dominance? And, if not, place them in order of dominance.

A. Well, as we discussed yesterday, the stressors really vary spatially and temporally. So any ranking is going to vary through the year and through this system. I stated yesterday I think the dominant stressors in the system are probably habitat, which I would include altered flow, siltation, sedimentation, and contaminated sediments being another major stressor in the system. So all of those others are additional stressors, but their importance is going to vary with the species, with the place, with the time.

Q. I don't know yesterday if we discussed the flow regime alteration factor in any detail. Can you tell me what analysis you did on this factor?

A. I did not analyze flow.

Q. Did you analyze the impact of dams, diversions, or other hydrologic modifications?

A. No. I am only aware of the literature on those.

Q. Let's move on to B. With regard to metals, are you referring to water column or sediment? So you have just indicated that your top three were degraded habitats, flow alterations,

which you did not study in detail, and contaminated sediments, correct?

A. Correct.

Q. So when you say metals in this context, are you referring to metals in the water column, or is that repetitive of contaminated sediments?

A. I'm speaking to sediments.

Q. Okay. Same question with regard to synthetic organic chemicals. Are you referring to water column or the sediment levels?

A. Sediments as shown in multiple studies that we discussed yesterday.

Q. Okay. So these really aren't separate factors then as they're outlined in this quotation?

A. I'm not sure what you mean.

MS. FRANZETTI: Counsel, that question seems unclear.

BY MS. WILLIAMS:

Q. It has a list of dominant stressors: Contaminated sediments, metals, synthetic chemicals, PAH, pharmaceut -- you know, it lists like -- it has a list of seven items.

A. Right. So let me clarify. Obviously,

contaminated sediments are going to contain high levels of nutrients, metals, synthetic organic chemicals. In addition, those PAHs that are in the sediment as we talked about yesterday dissolve into the overlying water and cause the photo-induced toxicity. We may get the same with nutrients causing some ammonia toxicity at the bottom. So the pharmaceuticals are going to be in the water column and also in the sediments, so it's --

Q. Did any of the studies we discussed yesterday test for pharmaceuticals in the sediments?

A. I can't remember, but we can talk about those now, if you'd like.

Q. Sure. Did you review any studies or conduct any studies that tested for pharmaceuticals in the sediments?

A. Yes. I reviewed studies that were conducted. The USGS study by Groeschen et al. that we submitted yesterday was one of those studies. Another one which was not submitted yesterday is No. 34 on Exhibit 371.

MS. FRANZETTI: Again, it was submitted. You may not have mentioned it yesterday. So No. 34, state what that is.

DR. BURTON: Excuse me. It was 24, Kolpen by Dana Kolpen, et al, also with the USGS which was a nationwide survey. And then Document No. 29 by Ramirez, et al., which looked at pharmaceuticals in fish tissue. All of these collected samples from this basin, samples were collected for the fish at the North Shore Channel. Samples for the water in the other two studies were collected at riverside on the Des Plaines which is just a little bit northwest of here. Also in Salt Creek which is draining the western suburbs and into the Des Plaines River. They were collected in the Ship Canal at Romeoville. So those were the major sites that USGS used in those two studies.

BY MS. WILLIAMS:

Q. I want to ask you a question about the Groeschen, et al., 2004 study. We don't have -- I don't think that's a hard copy, right, that was put into the record yesterday? That wasn't one of the ones that you provided?

MS. FRANZETTI: No.

MS. WILLIAMS: So I apologize that I'm

going to read a quote from it, but we can't refer to it in hard copy at this point.

BY MS. WILLIAMS:

Q. On Page 9 regarding pharmaceutical and household chemical contaminants, I'm going to quote, "Knowledge of the potential human and environmental health effects of these 95 compounds is varied. Little is known about the potential health effects to humans or aquatic organisms exposed to the low levels of most of these compounds or the mixtures of compounds found." Do you agree with this statement?

A. No.

Q. If not, why not?

A. Because there's been recent publications. We're missing one of the references to submit by Karen Kidd, which was kind of a Hallmark paper that was published in one of the top journals of the world two years ago. And she showed a population collapse of fathead minnows in a lake, in an experimental lake in Canada at five nanograms per liter which is a concentration. That was basically one of the estrogens that comes in birth control pills which is one of the very common products found below wastewater treatment plants.

And so that was a real world concentration. And they showed the collapse of the whole ecosystem due to that concentration. So since then there's been additional publications that are showing this link to collapse of aquatic ecosystems being exposed to these compounds.

Q. So you think the USGS study is no longer valid?

A. Oh, it's absolutely valid. That conclusion simply said they don't know the effects. Well, that study was done several years ago.

Q. So now we do? Now we feel we know the effects?

A. Yes, ma'am.

Q. You're referring to a two-year old study that's not on Exhibit 371. So I think we better provide at least a -- Can you provide for the record now the full citation?

A. I believe it's in here somewhere.

MS. FRANZETTI: I'll tell you what. Can we maybe look for that at a break and come back to it rather than take the time? Unless you think you can quickly.

DR. BURTON: Proceedings of the

National Academy of Science, 2007, Karen Kidd, et al. Google that and you'll have it.

MR. ETTINGER: Have you studied the very -- how wastewater treatment can affect the levels of personal care products and pharmaceuticals coming out of wastewater?

DR. BURTON: There was a study published this month by Chris Metcalfe, et al., at Trent University that stated that municipal wastewater treatment plants, typical wastewater treatment plants do not move -- remove more than 40 percent of these compounds. So 60 percent are still being discharged, and they found that they went several kilometers downstream and were found in fish downstream.

MR. ETTINGER: That's a standard activated sewage treatment plant?

DR. BURTON: I think he was referring to secondary treatment, yeah.

MR. ETTINGER: Secondary treatment. If you had -- Are you aware of any studies that do that for more advanced wastewater treatment?

DR. BURTON: I'm not aware. I would assume a carbon treatment would remove these compounds.

HEARING OFFICER TIPSORD: Dr. Burton, you also referred earlier to another study that didn't make the list earlier this morning. I apologize. I let that go by.

MR. GOODFELLOW: That was the same one.

HEARING OFFICER TIPSORD: Is it the same one? Okay. Thank you.

MS. WILLIAMS: I'm going to skip 77 and 78; 79 and 80 we had asked yesterday.

MS. FRANZETTI: I'm sorry. Can I have just a moment.

I'm just going to ask Dr. Burton in addition to the Karen Kidd study, the -- does the Ramirez study, which is included on the CD, No. 29 on the index of Exhibit 371, is that also a study that post dates the Groeschen study and as to the data regarding the effects of pharmaceutical products on fish?

DR. BURTON: Yes, it does. And the

nice thing about the Ramirez study which was published in 2009 is it has many citations. And I just noticed, Mr. Ettinger, they have a citation referring to the removal of products from wastewater treatment.

MR. ETTINGER: That's on our CD.

DR. BURTON: Yes.

MR. ETTINGER: Delightful.

BY MS. WILLIAMS:

Q. Do you believe these studies that you've listed represent a line of evidence comprised of high quality data from an adequate design to characterize spatial and temporal conditions that can be used in a weight of evidence approach?

MS. FRANZETTI: And I'm sorry. We're lost as to what question --

MS. WILLIAMS: This is a follow-up.

MS. FRANZETTI: Okay.

MS. WILLIAMS: I am looking at something from Dr. Burton that's in the record, but it's a follow-up.

DR. BURTON: Yes, ma'am.

BY MS. WILLIAMS:

Q. So you think we have enough data now

to use these studies as lines of evidence in a weight of evidence approach?

A. It is.

Q. Okay. I'm moving on to 82. Well, maybe I should ask 81 to make sure I'm familiar with which study we're referring to on phosphorous. Question 81 asks what recent USGS phosphorus studies are you referring to on Page 10 of your prefiled testimony?

A. The USGS report I'm referring to is the one that we submitted yesterday, No. 44. And I would like to amend a response I gave to Mr. Ettinger yesterday about the study. He asked me where they sampled. I rereviewed the study last night and they sampled the Ship Canal at Romeoville, they sampled Salt Creek at Western Springs, they sampled the Cal-Sag and the DuPage and the Chicago River at riverside. They found that every sample, every sample in the Illinois River basin exceeded the phosphorus recommended criteria of .1 milligrams. They found that ammonia in the ship canal was the highest in the basin and the fourth highest in the United States with the flow weighted mean average of 0.64. They found Diazinon

frequently in all the sites that had any degree of urban land use. This is a banned pesticide right now. Ninety-three percent of the samples in Salt Creek and 18 percent of these exceeded aquatic life guidelines. Benthos was degraded at all sites in the basin that had greater than 25 percent urban land use. Atrazine was in every single sample that had agricultural or mixed use land use.

Q. When --

A. Nitrate actually increased between 78 and 97 in the system; the cause of the better wastewater treatment plants that were converting more ammonia which is more toxic to nitrate. But still ammonia ranked eighth nationally at the Chicago River at Riverside. And the phosphorous in the ship canal was fourth highest nationwide in their 51 watersheds they compared. So I could go on and on here, but the point is at these multiple sites we have some of the worst water quality in the nation.

Q. So when -- Can I just finish this one? When you're saying this is the recent USGS phosphorus study, you're referring to here, right? So 1998?

A. These water samples --

Q. So when you say recent --

A. -- were collected between '99 and 2001.

MS. WILLIAMS: Thank you. That's all. Go ahead, Albert.

MR. ETTINGER: I was going to ask about the .1 milligram per liter measure. Where did that come from?

DR. BURTON: That's evidently the U.S. EPA recommended criteria.

And I should clarify for identification, because I've been saying 44. It's also 45. There's some overlap there studying the same water basin. Forty-five circular 1223 is the one that I've also cited as the 1230 is Groeschen, et al.

MS. FRANZETTI: And by 45 we're referring to the index of exhibits in the CDs that's been marked as Exhibit 371.

BY MS. WILLIAMS:

Q. Question 82: On Page 14 of Attachment 1 you state, quote, the waters of the UIW from above Chicago through the Dresden Pool have

high levels of nitrogen and phosphorus. What is the basis for this statement? I'm assuming the answer is the studies that we've just discussed.

The next question is high levels compare to what -- How do these levels compare to other areas of the State of Illinois?

A. Well, you're correct. I was referring to the USGS study which did nationwide comparison, and the only other comparison was within MWRD that looked at levels going downstream. And, as you know, some of those levels increased and some of those parameters decreased. The ship canal provided the most significant amount of nutrients that were being discharged into the Illinois River. And this system has been identified as one of the major sources of nutrients to the Gulf of Mexico.

Q. By this system you mean?

A. The upper Illinois -- the Illinois River basin as a whole.

Q. As a whole?

A. Yeah. And so it's being implicated in the anoxia problem in the Gulf of Mexico.

Q. Did you look at phosphorus levels at other parts of the Illinois River basin not covered

in the study?

A. No, I did not.

Q. Okay. A: Do you believe nitrogen and phosphorus can be reduced using effluent limits and best management practices on point sources?

A. Certainly they can. However, the increases in phosphorus that have continued over the last decade or so were attributed to municipal and industrial wastewaters as noted by Richard Landon, 2003, improved effluents do not alleviate also the problems of nonpoint source loadings.

Q. Have you factored in any future phosphorus or nitrogen treatment at the wastewater treatment plants into your analysis of this factor?

A. No, I haven't. But it's not going to effect the nonpoint source loadings. With an increase in urban development as we're seeing in the southwest part of this study area, there will be subsequent increases in municipal effluent volumes. So one would think phosphorus will continue to increase.

Q. So have you concluded that these stressors, meaning nitrogen and phosphorus, will not be remedied in the foreseeable future?

A. I don't really see how they can be. I don't see how -- well, first off, we already know the proposed deadline for TARP, 2024, and the areas outside TARP would take huge amount of municipal lead best management practices to reduce the nonpoint source. I'm skeptical whether that would occur.

MR. ETTINGER: I have a couple of questions. Have you seen effects of nitrogen in the Lower Des Plaines other than with regard to ammonia?

DR. BURTON: No. But I haven't targeted nitrogen as a stressor to try to tease it out of the other stressors.

MR. ETTINGER: Well, what might one do to tease it out?

DR. BURTON: It's fairly complicated. The environment in Canada has been doing this at some of their sites that have nutrient inputs and they have to set up streamside mesocosms and try to alter nutrient concentrations as the indigenous organisms are being exposed to them to try and tease out how that nutrient impacts that community.

MR. ETTINGER: Well, what would be the -- what would be the mode or way in which increased nitrogen would affect the aquatic life in the Lower Des Plaines?

DR. BURTON: Well, I mentioned ammonia. If you get increased ammonia, that's a problem obviously. But the increased eutrophication, which we've known about since the '70s, which degrades the habitat is another possibility. With a nutrient being increased you're going to get more photosynthesis occurring from plants and algae. So my concern would be increased algae, duckweed, macrophytes, which would then alter the system. It's up to the aquatic biologist to decide really what's bad with a more eutrophied system. But you know, as these areas become more eutrophied in the back waters, you're going to be more worried about dissolved oxygen sags.

MR. ETTINGER: I'm not going to get real technical here, but phosphorous and nitrogen cause eutrophication generally.

DR. BURTON: Yes.

MR. ETTINGER: And depending on the system, it may be either phosphorus or nitrogen which is the most limiting factor.

DR. BURTON: Yes.

MR. ETTINGER: And you have not looked at that specifically any the Lower Des Plaines?

DR. BURTON: No. But the more recent literature is suggesting where people were more focussed on nitrogen that usually it's both of those parameters that are an issue.

MR. ETTINGER: Now, looking, again, specifically at the Lower Des Plaines, have you seen either from going out there yourself or from looking at the literature any evidence of effects in terms of increased macrophytes or algal growth such as what you were talking about?

DR. BURTON: I did not in my mid '90s study. But more recently when EA was out there, they documented, and we have some photographs here.

MS. FRANZETTI: We have one photograph.

DR. BURTON: Of some primarily duckweed blooms. There were some blue green algae in this, it appeared, but it was mostly duckweed that was occurring in some of these still back waters and tributary amounts.

MS. FRANZETTI: I'll offer this photograph, which is captioned photograph depicting dense mat of algae, duckweed at Midwest Generation fish sampling location 408 which is, paren, mouth of Jackson Creek embayment river mile, 278.3 located just upstream of the I-55 bridge taken on September 10, 2008, as the next exhibit into the record.

HEARING OFFICER TIPSORD: If there's no objection, we will admit the photograph so described as Exhibit 380.

Seeing no objection, we'll mark it as Exhibit 380.

MS. FRANZETTI: And if I may, if I could just interrupt. Mr. Vondruska, does the caption that I just read -- let me back you up. Mr. Vondruska, were you out there at the time this photograph was taken?

MR. VONDRUSKA: I was not.

MS. FRANZETTI: Okay. Who was out in the river when this photograph was taken?

MR. VONDRUSKA: Two of my fishery biologists, on-staff fishery biologists.

MS. FRANZETTI: By your fishery biologists, you mean EA?

MR. VONDRUSKA: EA's. I'm sorry.

MS. FRANZETTI: That's okay. You can claim them.

And is it correct this photograph was taken on or about September 10 of 2008 by one of the EA fisheries biologists?

MR. VONDRUSKA: Yes, it is.

MS. FRANZETTI: And what was the reason they were out on the river at that time? And by that I mean they weren't looking for duckweed, correct?

MR. VONDRUSKA: No. We were conducting our standard fisheries monitoring program for Midwest Generation.

MS. FRANZETTI: And at this particular location you ran into the duckweed situation

and the photograph was taken to record it, correct?

MR. VONDRUSKA: That is correct.

MS. FRANZETTI: I think that puts it in context.

MR. ETTINGER: Just to tie it up then. You believe it's a reasonable likelihood that upstream sources of phosphorus and nitrogen caused this duckweed and bloom?

DR. BURTON: According to the USGS and MWRD studies, yes. They found higher concentrations upstream linked to the wastewater treatment.

MR. ETTINGER: Thank you.

BY MS. WILLIAMS:

Q. So in your report you concluded that blue green algae blooms are not an issue in this system, and you still support that conclusion?

A. No, ma'am.

Q. You disagree with your report on that point?

A. Yes, based on these recent findings.

Q. And these recent findings means the picture?

A. Yes. I do not think you will ever have this issue out in the flowing water because phytoplankton and algae, duckweed, don't like the flowing water. But in the quieter areas, late summer when this was taken, you're likely to have this issue now.

Q. Do you know if this followed a quiet period or a large storm event?

A. I don't know. EA?

MR. VONDRUSKA: What I recall is it did not follow a storm event. Well, in fact, it was about a week before the major 50-year flood event that occurred in mid September of that year.

MS. WILLIAMS: Okay.

MR. ETTINGER: Just to clarify, and there are side channels off of the main channel in the Lower Des Plaines that we're talking about.

DR. BURTON: What I've been calling back water areas, right.

MR. ETTINGER: And so like around Treats Island (ph.) or some of these areas?

DR. BURTON: Right.

MR. ETTINGER: And those are areas in which you believe there may now be or could occur cyanobacteria as a result of the eutrophication of these waters?

DR. BURTON: Yes, it could. It appears in this system duckweed is going to dominate.

MS. FRANZETTI: I'm sorry, Counsel. Mr. Vondruska, did you want to add to that?

MR. VONDRUSKA: Yes, if I may. What we've noticed recently in 2007 and 2008 are these much larger duckweed blooms, algae blooms than we've ever noticed before. Myself, EA, we've been sampling the system since 1987, and for whatever reason, this is a recent occurrence.

MS. WILLIAMS: And you don't have any theories at this point as to what the source might be?

MR. VONDRUSKA: I do not.

MR. ETTINGER: Is it possible that it's in part because the water quality is getting better?

MR. VONDRUSKA: Anything is possible.

DR. BURTON: Well, the phosphorus levels are going up. If that was the limiting nutrient for the duckweed, then that is why we'd see the bloom occur. But obviously we haven't done the study to make that relationship.

BY MS. WILLIAMS:

Q. 84C: Have you read the District's preliminary report on phosphorus reduction at its Egan facility?

A. No, I have not.

Q. Do you have any evidence that dissolved oxygen -- this is F. I'm sorry. Do you have any evidence that dissolved oxygen levels in the Upper Dresden Island Pool are being affected by nutrient levels?

A. No, don't have any evidence, but microbial respiration is linked directly to the presence of nutrients. So you're going to have more respiration with more nutrients, thus less oxygen.

MR. ETTINGER: Excuse me again. Where you have a lot of algal respiration, you see a familiar diurnal swing in water bodies; is that correct?

DR. BURTON: Correct.

MR. ETTINGER: So you're -- During the time that the critters or the algae are taking in oxygen, you'll see an oxygen crash. And when during the day you'll have high levels of oxygen in the water column; is that correct?

DR. BURTON: Correct.

MR. ETTINGER: Have you seen any evidence of that in this system?

DR. BURTON: I have not looked at that. I have heard reference to DO sags in the system, and that's why this new WERF study, I believe, is being conducted that I mentioned yesterday.

BY MS. WILLIAMS:

Q. I think you answered the first part of 85. The second part of that question asks have extreme reproduction disruption and feminization been shown to occur in the CAWS or lower Des Plaines River?

A. I should note that I just came across the complete reference on Kidd, since it pertains to your question.

MS. FRANZETTI: Counsel, do you mind if he reads that.

MS. WILLIAMS: Is it on 371?

DR. BURTON: It's in my answer.

MS. WILLIAMS: Go ahead.

DR. BURTON: It's Kidd, et al. 2007 Collapse of a Fish Population After Exposure to a Synthetic Estrogen, proceedings of the National Academy of Science, Volume 104, Pages 8897 through 8901.

MS. WILLIAMS: Thank you.

MS. FRANZETTI: Would you like me to actually obtain a copy and supply it to you for part of the record?

HEARING OFFICER TIPSORD: That would be good.

MS. FRANZETTI: We will do that.

DR. BURTON: So, yes, back to what's happened in this system. The studies I cited before by Ramirez, et al., showed effects. And the two USGS studies showed these chemicals were occurring in the system and --

MS. WILLIAMS: That's not my question. Have extreme reproduction disruption and

feminization been shown to occur in the CAWS or Lower Des Plaines River.

DR. BURTON: There has --

MS. FRANZETTI: Counsel, I guess that depends on --

MS. WILLIAMS: I didn't ask -- We already talked about that there's been studies that have found that these chemicals are out there. The question --

MS. FRANZETTI: Well, no. But when he was noting earlier specifying after checking the reports and noting down all of the sampling locations, there was one in the Chicago Sanitary and Ship Canal.

DR. BURTON: But that was only the fish tissue. There is another study that I also believe came from that sample of largemouth bass by Hink, et al., 2009, published in Aquatic Toxicology that showed widespread occurrence of intersects in black bass throughout the country.

BY MS. WILLIAMS:

Q. And did that study take samples in the CAWS or the Lower Des Plaines --

A. I believe one of the samples came from the North Shore Channel.

Q. Okay. That answers my question. Thank you, Dr. Burton.

MR. ETTINGER: Can I follow up on that slightly?

MS. FRANZETTI: I'm sorry, Albert. Before you do, just so we can keep track of what's in the record and where. I'm sorry to interrupt you. But the Hink study is No. 19 on the index of exhibits for Burton testimony Exhibit 371.

MR. ETTINGER: You say the Hink study. Was that Schoenfuss's work or is that a different study?

DR. BURTON: I don't remember the co-authors.

MR. ETTINGER: Are you aware of Heiko Schoenfuss's work on North Shore Channel?

DR. BURTON: No.

MR. ETTINGER: Are you aware of any studies specifically that looked at fish phytogellen (ph.) effects or other things in the Chicago area?

DR. BURTON: No, I'm not. It doesn't mean they're not there.

MR. ETTINGER: Okay. Thank you.

HEARING OFFICER TIPSORD: Mr. Ettinger, you're fading on us a little bit. We have a lot of traffic.

MR. ETTINGER: I'm fading on myself, too.

HEARING OFFICER TIPSORD: Just keep your voice up.

MR. ETTINGER: I'll be more careful in the future.

HEARING OFFICER TIPSORD: We have a lot of train traffic this morning, too, for some reason. Mr. Andes?

MR. ANDES: Of the largemouth bass taken from the north shore channel, did any show intersect effects?

DR. BURTON: I believe the Hink study showed that. I'm not for certain.

MR. ANDES: All right. We can introduce evidence that no intersects were shown in the fish sampled in the channel, and we'll provide that information later.

MS. WILLIAMS: Thank you, Fred.

DR. BURTON: What I would like to add is several of the points yesterday on urban run-off. When a phenomenon showed to exist consistently across all places studied below municipal wastewater treatment plants, one assumes it occurs here.

BY MS. WILLIAMS:

Q. So do you agree that phenomenon that are generally applicable in typical systems impacted by wastewater treatment plants are applicable in this system?

MS. FRANZETTI: Objection to the form. I think that's too vague, Counsel.

DR. BURTON: What I'm referring specifically to is phenomenon that related to municipal wastewater treatment plants and urban run-off which is what I've been talking about the last few days. And it's shown repeatedly everywhere it's studied.

BY MS. WILLIAMS:

Q. So this system is similar to everywhere that it's been --

A. It's actually worse because there's a

greater degree of both of those factors.

Q. Of what factors?

A. Of urbanization and wastewater treatment plants, the largest in the world.

Q. Okay. I think we probably answered 86, but I want to be sure that you have directed us towards the U.S. EPA study you are referring to on Page 10 of your prefiled testimony with respect to pharmaceutical compounds and fish tissue?

A. Yes. That's Ramirez, et al., 29.

Q. Thank you.

MS. FRANZETTI: On Exhibit 371.

BY MS. WILLIAMS:

Q. So Question 87 says on Page 10 to 11 you state a recent lake study conducted in Canada found that fish exposed to levels commonly found in untreated and treated waste waters resulted in feminization of males, et cetera. Is this the --

A. The Kidd, et al.

Q. Is the Kidd, et al, study. Okay. What compounds or compounds is this referring to?

A. She was using the synthetic estrogen that's used in birth control pills. Do you want to know the technical name of that compound?

MS. WILLIAMS: Oh, sure.

DR. BURTON: I'll spell it out. 17 Elpha, E-L-P-H-A, dash E-T-H-Y-N-Y-L, estradiol, E-S-T-R-A-D-I-O-L. EES is what it's commonly referred to.

BY MS. WILLIAMS:

Q. Thank you. I don't know if in 88, have we established whether any of the studies and data out there have taken samples in the Upper Dresden Island Pool with regard to pharmaceutical and personal care products?

A. I'm not aware of any.

Q. Okay.

A. The study by Metcalfe, No. 28, on Exhibit 371, the one that I said removed 40 percent of these compounds and treatment, he found that these compounds would travel several kilometers downstream of the discharge point and they would have breakdown metabolite products that were also a problem. So one would assume they're in the Upper Dresden Island Pool.

MR. ETTINGER: I'm sorry. Several kilometers. What do you mean by that?

DR. BURTON: I mean several kilometers

downstream.

MR. ETTINGER: Well, several can mean two I was told by one witness, and two kilometers won't get us from Stickney downstream. So what do you mean by --

DR. BURTON: I don't remember the exact number. I'm sorry.

MR. ETTINGER: Okay. And by -- Could you elaborate a little on the breakdown products? Breakdown products can get more than several kilometers downstream, or what did you mean there?

DR. BURTON: What the compounds, as they go downstream, are degrading and forming breakdown metabolites. Those products we found downstream and implicated them as being a problem in the fish. One of the conclusions of the study was you need to look at the breakdown products.

MR. ETTINGER: Sometimes the breakdown products can be more toxic than the product that was discharged.

DR. BURTON: That's the case for atrazine, yes.

MR. ETTINGER: Thank you.

BY MS. WILLIAMS:

Q. Okay. Let's skip on to 91. On Page 10 of your prefiled testimony it states, quote, UIW and UDP are also adversely effected by organic compounds collectively referred to as emerging contaminants which include endocrine-disrupting compounds found in pharmaceuticals personal care products, and veterinarian livestock operations.

A: Does U.S. EPA have -- currently have guidance or criteria on emerging contaminants?

A. No, they don't. The U.S. EPA is very worried about these contaminants, so they have prepared some draft guidance on how to prepare criteria for these. Their worry is if they follow the same old process, it will take them years and years to develop it. So they've proposed a speedy process to develop guidelines that would start with EPS that we just talked about. I serve on the EPA science advisory board that reviewed their initial guidance just a few months ago. And I think in the next year we'll see a formal process come forward to develop those numbers.

Q. Do you believe those chemicals should be regulated as part of the Agency's proposal for these waters?

A. I'd rather not comment on that.

Q. Why?

A. It's a policy question.

Q. Well, I didn't mean it as a policy question. I meant it as a scientifically whether you think it's necessary to protect aquatic life that currently exists in the system. So, in your opinion, being on this advisory panel?

MS. FRANZETTI: I'll just object, Counsel. He hasn't said he's developed an opinion. You can say it's not policy. He thinks it is. So with that, can you answer the question?

DR. BURTON: I would look at these as another stressor. That's the way I've mentioned them here in my testimony.

BY MS. WILLIAMS:

Q. Another stressor that can't be remediated or that should be remediated?

A. That could be remediated.

Q. Okay. Thank you.

A. Yes.

Q. Question 92: On Page 4, Paragraph 1 of your testimony you state, quote, "Dominant stressors for the UDP included contaminated sediments, metals, nutrients, synthetic organics such as pesticides, carcinogenic PAHs, pharmaceuticals, and personal care products.

I think we've already asked this question, but are you referring to these chemicals and the sediments the water column or both?

A. As we discussed earlier, the sediments primarily. I think we've answered the rest of this.

Q. Question 93, the second sentence: Are most effluent dominated waterways incapable of attaining Clean Water Act aquatic life goal uses because of endocrine-disruptures or personal care products?

A. Well, if it's part of -- If it's one part of the system, it's likely to be distributed throughout the depositional sediments and waters.

Q. But I know the question is getting at if this is present in most -- if these chemicals are present in most effluent dominated systems, is it really a stressor that's preventing attainment of

Clean Water Act goals in most systems?

A. It would be a site specific issue. It would vary at every site. You would have to study that.

Q. Are you aware of any sites that are able to attain Clean Water Act aquatic life use goals that are impacted by these stressors?

A. I haven't made that evaluation.

Q. Okay.

MR. ETTINGER: Were you going to ask the last sentence of No. 93?

MS. WILLIAMS: I thought I just did. Did I? No? I can -- if it'll help, Albert, I'll ask.

BY MS. WILLIAMS:

Q. Are you aware of any U.S. EPA water quality or effluent standards for endocrine disruptures or PPCPs?

A. We just answered that question.

MR. ETTINGER: Well, are you familiar with standards for nonylphenol ethoxylates?

DR. BURTON: The EPA, I believe the U.S. EPA would put that in the group of emerging contaminants that they haven't

developed standards for as far as aquatic life are concerned. That was part of the --

MR. ETTINGER: Okay. We'll talk about that later. So you're not familiar with --

DR. BURTON: No.

MR. ETTINGER: That standard or that criteria at the federal level, are you? Is atrazine an endocrine disruptor?

DR. BURTON: I should back up.

MR. ETTINGER: That's what I thought.

DR. BURTON: We've been focussed on -- I've been talking about PPCPs, pharmaceuticals and personal care products. Of course atrazine is not a personal care product. But there are a lot of chemicals that are endocrine disruptors, as Mr. Ettinger just suggested, atrazine in some of the breakdown products. So when we talk about endocrine disruption and effect on fish reproduction, that can be a host of other chemicals.

MR. ETTINGER: Just to make clear, nonylphenol ethoxylates are normally not used as personal care products either. They're

used as surfactants. Did you mean to not consider surfactants as you were not considering atrazine or --

DR. BURTON: Right.

MR. ETTINGER: Okay. But you are aware of criteria --

DR. BURTON: I'm not aware of those criteria.

MR. ETTINGER: Okay. Thank you.

BY MS. WILLIAMS:

Q. I'm moving on to Question 96. On Page 6 you state, quote, "This widespread contamination of the UIW is reflected in the many fish consumption advisories posted throughout most of the Des Plaines watershed due to the high levels of mercury and PCBs found in the sediments."

The question is what is the basis for this statement and how did the fish consumption advisories in the CAWS and Lower Des Plaines River differ from the rest of the State of Illinois?

A. The basis is the IEPA data, but I don't know how and to what extent these advisories differ from the rest of the state because I did not make that evaluation.

Q. So are you aware of whether or not there are statewide fish consumption advisories?

A. I only focussed on this system.

Q. Okay. Question 97: What conclusion is to be drawn from your statement on Page 12 that, quote, "Nitrification is also inhibited by cold temperatures and ammonia is not always consumed in upper sediment layers"?

A. These were in response to incorrect statements made by the authors of the UAA report on the Lower Des Plaines River that incorrectly imply and overgeneralize that high temperatures are always detrimental. As I said in my testimony, there's no simple relationship between temperature and the nitrification process or aquatic toxicity.

Q. So do you think that the high temperatures in the Upper Dresden Pool are improving the ammonia toxicity situation?

A. No.

Q. Okay.

MR. ETTINGER: I'm sorry. I haven't looked at the latest. If it's just a matter of chemistry, is there a relationship between high temperature and the amount of unionized

ammonia that you would find in a given sample of ammonia?

MR. GOODFELLOW: I'll answer that one, because I'm much more familiar with the data. The relationship of unionized ammonia is most affected by pH. pH is, by far, the greatest factor. And then a 10 degree change of temperature will change substantially the toxicity of -- or the unionized ammonia, not necessarily anything on the toxicity. It will get higher, but it's in groups of 10 degrees centigrades. So it's -- And it's much, much lower -- much, much smaller in comparison to DH.

MR. ETTINGER: So it's a smaller effect, but there is a positive relationship between temperature and the amount of unionized ammonia that you would expect for a given amount of total ammonia?

MR. GOODFELLOW: Correct. Now, in natural systems often higher temperatures will have lower pHs. It just -- I'm sure it has something do with gas exchange across the surface. So that process dampens it, too.

So it makes it more difficult, and that's why ammonia toxicity is just as complicated in the criteria document is voluminous.

BY MS. WILLIAMS:

Q. Question 98: On Page 15 of your prefiled testimony it states, quote: Acute toxicity of water and sediments unrelated to temperature is and will remain a major limitation on the potential of this water body to achieve Clean Water Act aquatic life goals. Which parameters in the water are acutely toxic? And do you have documentation that the water is acutely toxic?

A. I actually didn't study what parameters in the water were actually causing the toxicity. I just measured the toxicity that was occurring in the water. I was able to attribute some toxicity to total suspended solids and some to photo-induced toxicity through a TIE.

MR. ETTINGER: I'm sorry. So you did some sort of wet testing with just the water column water and found acute toxicity?

DR. BURTON: Yes.

MR. ETTINGER: And that's discussed in one of these reports?

DR. BURTON: Yes, summary report.

MS. WILLIAMS: Where were those samples taken?

DR. BURTON: We had samples that stretched from Brandon Road Lock & Dam to the intake of the Joliet plant in the discharge canal downstream to I-55 and the Kankakee River.

BY MS. WILLIAMS:

Q. Water samples?

A. Water samples.

Q. Okay.

MS. FRANZETTI: Counsel, just to clarify. He did a series of tests, and they were at multiple locations. That's what he was just describing.

BY MS. WILLIAMS:

Q. And over what time period? Again, just focussing on the water samples.

A. These -- the major study there occurred during the summer with sample periods in July and in August, and they were done in situ; that is, organisms in the field, exposed.

Q. I'm sorry. I meant years.

A. '95, I believe.

MR. ETTINGER: I'm sorry. Were you referring -- I believe I was reading about your '95 studies. I believe at one point there was an unidentified discharge of raw sewage that you discuss in your report. Is that what you're referring to here or was there some other sample?

DR. BURTON: That was one incident in one of the exposures, a subsequent exposure. There was no discharge, or at least we didn't smell one.

MR. ETTINGER: Okay. Have you done any -- so basically you have that one sample in '95 in which you did wet testing and thought you knew what it was caused by. And there were other samples in which you did wet testing and which were those.

MS. FRANZETTI: Albert, you know, if you don't mind, can I ask him to maybe back up and give a general --

MR. ETTINGER: That's fine with me --

MS. FRANZETTI: -- description. I think it will clear up the confusion of

what -- and what I referred to by a series of tests. Could you describe the testing you did back in 1995, the first series, second series, locations at which you did them. I know you've said it a minute ago, but if you could do all of this kind of in one answer, I think it would help everybody in terms of at least knowing what the overall amount of work was that you did. And, perhaps generally, the type of testing that it was.

DR. BURTON: Okay. Quite a few different experiments were conducted. We did first a survey of the sediments over 55 miles in the Dresden Lock & Dam up to downtown. And that was to measure sediment toxicity and the chemicals in the sediment. We saw a lot of acutely toxic sediments from the Dresden area upstream. They became worse as you went upstream.

MS. FRANZETTI: That's the sediment testing?

DR. BURTON: That's the sediment survey. And then we did a series of tests in the Des Plaines with in situ exposures with

three or four organisms in cages set out in the stream at the sites I just mentioned: Upstream of Joliet, discharge canal, downstream to I-55 and the Kankakee River. We were kind of using as a reference river. And that was done on two occasions. The reason we repeated it was because in that first exposure, the effluents weren't hot enough, the water -- it was a cool period in the summer. And we got this discharge of raw sewage proximally coming from the Joliet plant.

MS. FRANZETTI: I'm sorry. Where -- Did that affect all four stations?

DR. BURTON: It affected all of the ceriodaphnia that were being exposed were killed everywhere. So we repeated the tests a month later when it was warmer, so the effluents were warmer, the Des Plaines River was warmer, and all of these sites. And the interesting conclusion from that is that we saw acute toxicity throughout the system at all the stations we measured. So there was acute toxicity occurring Kankakee River,

I-55, upstream to Brandon Lock & Dam. And it was worse for some organisms in the thermal discharge canal.

MS. FRANZETTI: Can you -- I know --

DR. BURTON: And we did laboratory studies, seven-day exposures at different temperatures. We tried to look at ammonia in the lab. We did in situ exposures looking at ammonia in the sediment and the overlying water. And I think that's all of it.

MS. FRANZETTI: Okay. Would you mind -- I know you pulled out to try to help answer this question, a -- one of your reports that is entitled the Upper Illinois Waterway Ecological Survey, July 1998 to October 1998, continuous in situ toxicity monitoring and thermal effect characterization task final report, March 11, 1999. This is not on the CD. We really had expected to go into this in more detail in Phase 2, but its relationship to temperature, but -- So we will get this report into the record. But could you, just to summarize, read your -- the conclusion on the in situ

biological responses that were found as a result of these in situ tests you've just described?

MS. WILLIAMS: Wait. You're asking him to read from a report, but it's not one of the reports you've provided?

MS. FRANZETTI: Correct. And I will put it into the report.

MS. WILLIAMS: You don't have it today?

MS. FRANZETTI: We intended to get more into this, Counsel, in the thermal standard phase.

DR. BURTON: One of my 15 conclusions was in situ biological responses did not tend to differ significantly between the field sites when the river water temperatures reached recorded highs. However, during periods of lower temperatures, one of the organisms chironomus tentans survivals at I-55 were lower compared to the other stations, and hyalella azteca, another EPA organism survivals were significantly different in I-55 than the other test

stations.

MS. WILLIAMS: Was one of your other conclusions --

MR. ETTINGER: I'm sorry. I just want to go back and give one of your answers, because I think, actually, Miss Franzetti might want to correct this. You talked about a discharge from the Joliet plant as affecting something. I'm not sure what plant you were referring to, and I suspect there was a mistake made there.

DR. BURTON: I have no basis for this statement other than the Joliet plant that is at the Hickory Creek which was just upstream of where we were working exists there. And we smelled raw sewage, so that's a supposition that it was from that --

MR. ETTINGER: You're referring to the Joliet sewage treatment plant.

DR. BURTON: Yes, yes.

MR. ETTINGER: Thank you.

MS. FRANZETTI: I think he had earlier, but I appreciate the clarification in the event someone thought that was a

Midwest Gen Joliet station.

MR. ETTINGER: Well, you don't discharge sewage, so that would have been surprising.

MS. FRANZETTI: It would be a stretch to interpret it that way.

HEARING OFFICER TIPSORD: Miss Williams?

BY MS. WILLIAMS:

Q. Can you explain how when you performed the in situ studies, how did you determine the control for whether there were toxic -- you mentioned you need a control to compare. Can you explain that for us?

A. When you're doing in situ testing, you have to do a couple of things. You need a laboratory control that's comprised of the organisms that you are using in a test that you're putting into the chambers that are going out to the stream to make sure that they're healthy. And, in fact, on a couple of occasions all of our fathead minnows died. They were in poor condition from shipping. It's also important to have a good reference that's in situ. So a waterway that you think is better

quality that you'll get good survival in, and that's in this case really were two: It was upstream of the Joliet plant and it was the Kankakee River, so two good references.

Q. I'm sorry. Based on what we just talked about when you say again upstream of the Joliet plant, you mean?

A. The power -- Midwest Gen.

MS. FRANZETTI: Try to use station.

MR. ETTINGER: I'm sorry. You mentioned the Kankakee again. And I thought I heard as part of your -- one of your earlier answers that you found acute toxicity in the Kankakee River also. Was that true?

DR. BURTON: That's one of the joys of doing in situ field work. You never know what you're going to get.

MS. FRANZETTI: Is the answer yes?

DR. BURTON: So the answer is the Kankakee has acute toxicity. It's not a clean reference site.

MR. ETTINGER: And where did you find that? Where specifically were you looking in the Kankakee that --

DR. BURTON: We were at the mouth.

MR. ETTINGER: At the mouth of the Kankakee?

DR. BURTON: Yes, sir.

BY MS. WILLIAMS:

Q. Okay. Where did we leave off? I'd like to move on to 99. On Page 15 of your testimony you state that, quote, the development of new modified standards including thermal standards will not address the key issue of excessive and pervasive pollution sources, excessive use impairments, and limited habitats in this watershed. The first question I'd like to ask is sort of a follow-up. When you say limited habitats, what habitat data did you look at to determine limited habitats?

A. I looked at the EA reports on habitat. I think I've also seen data, the report that just came out from MWRD, and just my own --

Q. Well, you didn't look at that report in developing this opinion, right?

A. No, no.

Q. Okay.

A. But I looked at it before this testimony. And also I was on the river a lot, so

that was not a QHEI. It was just my experience.

Q. Okay. When was the last time you were personally out there?

MS. FRANZETTI: Upper Dresden Island Pool area?

MS. WILLIAMS: That would be fine. Upper Dresden Island Pool.

DR. BURTON: Probably 1999.

BY MS. WILLIAMS:

Q. Thank you. Subpart B. I'm going to skip A. I think we've answered A. But Subpart B of 99 asks whether you believe the current secondary contact and indigenous aquatic life use water quality standards sufficiently protect the current and potential biological condition of this system?

A. I haven't done that evaluation. And to do that I would want to consult with some other experts, fisheries experts.

Q. Have you -- do you know what they are? Have you read them?

MS. FRANZETTI: What is the they you're referring to?

MS. WILLIAMS: Secondary contact and indigenous aquatic life use water quality

standards.

DR. BURTON: I've read them. I don't think I can repeat them.

MS. WILLIAMS: No.

MS. FRANZETTI: We're not going to ask you to, I hope.

BY MS. WILLIAMS:

Q. Are you aware that most of them are based on effluent technology standards from the 1970s?

A. I'm not surprised.

Q. So knowing that do you have any opinion about whether they're sufficient to protect aquatic life in this system that's currently there? The question is current --

MS. FRANZETTI: Counsel, I'm going to object. He answered that question.

DR. BURTON: Yeah. I already answered that. I'd like to consult with other aquatic biologists.

BY MS. WILLIAMS:

Q. Like Mr. Seegert?

A. Such as Illinois EPA.

Q. Are you aware that Illinois EPA has

concluded they're not sufficient?

A. No.

Q. Okay. I think I can skip a few here. Why don't you give me a second to see how far --

HEARING OFFICER TIPSORD: Let's take a ten-minute break.

(Short break taken.)

HEARING OFFICER TIPSORD: I think we're ready to go back on the record.

BY MS. WILLIAMS:

Q. All right. Dr. Burton, I'm going to skip over most of the rest of my questions. I'd like to ask part of 109, however, if you want to flip ahead. Question 109 says, you state on Page 13 of your testimony that, quote, the application of these three UAA factors does not support the upgrading of use designations under the proposed UAA rules.

Are you aware, Dr. Burton, that the Agency's proposal with the exception of the Upper Dresden Island Pool is proposing something less than the Clean Water Act goals? This is the follow-up. This is didn't directly in there.

MS. FRANZETTI: Did you understand the

question?

MS. WILLIAMS: Do you understand the question?

DR. BURTON: Would you repeat it, please.

BY MS. WILLIAMS:

Q. Are you aware that with the exception of the Upper Dresden Island Pool the Agency's proposal in this proceeding is proposing something less than Clean Water Act aquatic life goals for this system?

MS. FRANZETTI: By the something she means they're proposing a use designation that is lower than the Clean Water Act fishable goals.

DR. BURTON: Yes.

BY MS. WILLIAMS:

Q. Okay. In your opinion -- this is Subpart C. In your opinion, could Illinois upgrade the CAWS and Lower Des Plaines River from its current designation to something incrementally better but still below the Clean Water Act aquatic life use goals?

A. No.

Q. Explain why not.

MR. ETTINGER: Well, I don't know if it's my place here to interpose an objection or not, but it seems like you're asking sort of legal questions of a biological witness, so I don't understand.

MS. FRANZETTI: Well, we have another problem, Albert. He thought she had read B, kind of the problem with prefiled questions. Assuming she was moving to B, and she moved to --

BY MS. WILLIAMS:

Q. I did say C, right?

MS. FRANZETTI: No. I am not saying you didn't say it, Counsel, but he just assumed you're going to the next question to which his answer was no. So I think we need to clarify --

DR. BURTON: Yes. That's --

MS. FRANZETTI: With respect to Question 109C, would you like to amend or correct your answer?

DR. BURTON: Yes. Because I thought she said B. If the information supported

such a conclusion, I believe it could be based on my general knowledge that states like Ohio have created a use classification system that contains several United States designations that are below the Clean Water Act aquatic life use goals.

BY MS. WILLIAMS:

Q. Thank you. Are you aware -- and this is also a follow-up. Are you aware of any use attainability analyses that have relied on contaminated sediments as a primary factor in downgrading the designated aquatic life use?

A. Well, I believe I stated yesterday that I haven't reviewed any use attainability analyses in recent years.

Q. Okay. And so the answer is you're not aware of any?

MS. FRANZETTI: No. The answer is he doesn't know because he hasn't looked.

MS. WILLIAMS: Okay. That's all I have.

MS. FRANZETTI: I would, if you don't mind, Albert, there was one question that the Agency skipped that I actually would like to

ask and have the answer on the record. It's 104. On Page 15 of your testimony you state that the Illinois EPA's presentation of the data, data interpretation and supporting statements, are often biased. Identify which statements and data presentations are biased. What do these statements reflect a bias toward? I'm not asking you why would the Illinois EPA have such a bias in your opinion.

DR. BURTON: I use the word bias because I believe the Illinois EPA here failed to conduct a thorough review of all the relevant factors and available data and then to present an objective review of those results. The extensive studies performed by Com Ed in the '90s found contaminated sediments occur in all three pools and are present in the side channels and back water areas, the areas that are most important biologically. EA's 2003 habitat evaluation found sedimentation was moderate to severe and 70 percent of the sites of the Dresden Pool areas. Another indicated that

sedimentation had not improved or appeared to have gotten worse in some areas. The data showing extensive presence of siltation and sedimentation and sediment contamination that existed was not thoroughly reviewed, nor was it objectively presented by the Agency. If it had been, the Agent could not have reached the conclusion that it thinks sediment contamination conditions are improving. Moreover, the UAA report for the Lower Des Plaines River presented an unsupported conclusion that its contaminated sediments can be removed permanently and are not a limiting factor to the overall improvement of this waterway. There was no identification of any proposal, plan, or funding by anyone that would remove the biological limitations of these sediments, contaminated or otherwise, that replace on the Upper Des Plaines Island Pool, and prevent them from recurring. In addition, other studies such as the U.S. EPA, USGS, and MWRD have shown high levels of sediment in water contamination from major pollutants from

multiple pollutants and that this watershed is one of the worst in the nation based on chemical concentrations of these pollutants. And that wasn't acknowledged by the Agency.

Further, rather than present a detailed review of peer-reviewed sediment studies from the '90s and UAA report, instead presented only average sediment sampling values from U.S. EPA's sediment sampling database. This partial disclosure of the U.S. EPA sediment sampling results did not provide any meaningful or scientific assessment. The average values do not reveal whether they reflect a broad or narrow range of individual sediment sampling locations. Grouping of sediment data together to present an average of contaminants does not provide a true picture for specific areas contaminated averaging dampens out heterogeneity which is an extremely important factor in determining the adverse effects of sediments and organisms. The data in the UAA report didn't disclose or differentiate between sediment sample types or sampling site locations on

any given location. There was no way to determine if that data came out of the main channel where you wouldn't have high levels or the side channel or back water areas.

Another example with respect to nonpoint source discharges to this system is Agency testimony showing they did not conduct a thorough review of the effects of urban run-off on this system. It testified that, "Are you telling me that in an agency's opinion the urban run-off," the question was, "which is nonpoint source to this waterway is not a significant stressor?" The answer by the Agency was, "We didn't focus our energies on that because this is an effluent-dominated waterway. It's insignificant to the other inputs into this system."

MS. WILLIAMS: Dr. Burton, can you please provide a citation to what you're reading there?

DR. BURTON: January 8, '08, Agency testimony, Sulski, Pages 107 to 108. So the lack of the review of the impacts of urban run-off also bias the Agency's result. And

it's odd that IEPA's Marsha Wilhite stated in 2003 that urban run-off is a significant cause of impairment in the UIW and that most of the wastewater is untreated and the impairments are greatest in the Calumet and Des Plaines River. That was Wilhite 2003 Urban Storm Water Issues in the Illinois River basin and the Illinois water resources center 2003 governor's conference on the management of the Illinois River system.

MS. WILLIAMS: Are you referring to an oral statement or a written statement?

DR. BURTON: This is a published proceeding special report No. 23.

MS. WILLIAMS: Do you know if it's part of the record in this proceeding?

DR. BURTON: It is not.

MS. FRANZETTI: I don't think it is. He found it just before presenting his testimony here. It's available on the web, I think.

DR. BURTON: Yes. I got it off the web. Given the mass population impervious area in the municipal effluent domination of

the system, the wealth of information dominating adverse effects, the lack of consideration of urban run-off, in my opinion is, frankly, amazing.

Also with respect to my toxicity studies from the mid '90s, I also believe the Agency accepted in the LDR UAA report an inaccurate and biased interpretation of those results of my studies which is apparently relying on to support the proposed use designation and UIP. More generally I believe IEPA gave greater way to the water chemistry above the biological and physical data. Those are some of the examples on which I base my opinion.

HEARING OFFICER TIPSORD: Dr. Burton, could we have the citation to the website where the Wilhite --

MS. FRANZETTI: I don't know that we have the website.

DR. BURTON: I can give you the absolute full citation.

HEARING OFFICER TIPSORD: That would be good.

DR. BURTON: Wilhite M, 2003, urban storm water issues in the Illinois River Basin in Illinois Water Resources Center, editor, 2003 governor's conference on the management of the Illinois River system, comma, the Illinois River: Sharing the Visions. Ninth Biennial Conference Proceedings Special Report No. 29 Urbana, Illinois.

HEARING OFFICER TIPSORD: Thank you.

MS. WILLIAMS: So I didn't hear in that answer, Dr. Burton, the questions in 104 that say what do these statements reflect a bias toward? And why would Illinois EPA have such a bias, in your opinion?

DR. BURTON: As to what these statements provide a bias towards, they present a bias towards ignoring or discounting evidence that shows there are conditions in the UDIP waterway that satisfy one or more of the UAA factors. Through the ship canal they present a bias toward believing this waterway can attain a higher level of use designation than it actually

can.

MS. WILLIAMS: Why would the Illinois EPA have such a bias, in your opinion, towards not finding factors present?

DR. BURTON: I'm not going to speculate.

MS. WILLIAMS: Would you agree that there's a presumption that Clean Water Act aquatic life use can be attained unless there is definitive evidence that they can not?

MS. FRANZETTI: Objection. That's a legal question, and that presumption is rebutted by application of one of the six UAA factors, which you have to include to ask a fair question and that -- that's what he was addressing in his answer with respect to --

MS. WILLIAMS: I think the question is that he's accusing the Agency of bias which is not -- I mean that's the unfair issue I think we're trying to get. You're accusing the Agency of bias without reflecting that there is a presumption that's rebuttable.

MS. FRANZETTI: The presumption is not a bias. And, Counsel, if you equate

presumption with bias, I strongly disagree with your definition of the terms presumption and bias. A presumption is simply that. It's a starting point. And under the regulations, the UAA regulations gives six grounds on which you can rebut that presumption; has nothing to do with bias.

MS. WILLIAMS: But it is your testimony, Dr. Burton, that the Agency is biased against finding UAA factors present in this case?

DR. BURTON: Yes. In the presentation of the scientific data --

MS. WILLIAMS: And would you agree that --

HEARING OFFICER TIPSORD: Let him finish his answer, please.

MS. WILLIAMS: Go ahead.

DR. BURTON: The bias that I just talked about was the presentation of the scientific rationales.

MS. WILLIAMS: Would you agree that the Agency invoked three of the six UAA factors in its proposal before the board in

this proceeding?

MS. FRANZETTI: Objection, Counsel. It didn't as to UDIP, so you need to exclude UDIP or that statement is inaccurate.

MS. WILLIAMS: In this proceeding has the Agent invoked three of the six UAA factors? I don't think that question is inaccurate.

MS. FRANZETTI: With the understanding you're not specifying for what waterways --

MS. WILLIAMS: Okay.

MS. FRANZETTI: You can answer the question.

DR. BURTON: Yes.

MS. WILLIAMS: And in the Upper Dresden Island Pool has the Agency invoked one of the UAA factors with regard to recreational uses?

DR. BURTON: Yes.

MS. WILLIAMS: Thank you.

HEARING OFFICER TIPSORD: Move on to Mr. Ettinger.

E X A M I N A T I O N

BY MR. ETTINGER:

Q. Just to follow up on that, you talked about the Ohio classification system. Are you familiar with the Ohio classification system?

A. Yes.

Q. How would you classify these waters using the Ohio classification system based on your --

A. Modified warm water habitat.

Q. That would be for the Lower Des Plaines or which portion?

A. The Ohio EPA implies -- applies that to any system that was historically channelized.

Q. Modified warm -- what was that?

A. Modified warm water, I believe.

Q. Modified warm water habitat I think is what you said.

A. It has been a while.

Q. Thank you. I have a problem here in that I have to go through two days of testimony and pick out the questions that I think haven't already been answered, and so we'll see where we go from here. Some of these have been touched on before, but I want to clarify them a little more or something like that. So you'll have to bear with

me. You'll be pleased to hear that I'm not going to ask most of my prefiled questions because they've either already been asked or we went somewhere else.

So I'd like to look at now my prefiled questions No. 19. We've been over this before I realize, but I want to try to get a little more information on that. The question was -- the whole question is do you believe that emerging contaminants are affecting aquatic life in the CAWS or the Upper Dresden Pool? We've certainly answered that.

If so, how -- I think we've discussed that. But which contaminants? We have talked about some of them, but I'd just like to get any more information you have on these emerging contaminants because you sort of named names as far as the chemicals that we're thinking about here.

A. I would seriously doubt that anyone is capable of providing a good answer to that because there's so many that are present simultaneously in these systems. And so it would be very difficult to say which one is causing the most endocrine disruption. There's no TIEs for endocrine disruptors.

Q. Is there a -- What would be the prime suspects? I mean if I were going to start looking at ones that you think would have an effect, which would be the ones that I would look at?

A. The prime suspect is the dominant concentration. It's probably going to be something like EES which is the first one that the U.S. EPA will probably establish a criteria for.

Q. EES?

A. That was that long scientific name I gave you, synthetic estrogen.

Q. All right. And the leading cause -- I'm sorry -- the leading source of that is birth control?

A. Pills.

Q. Thank you.

MS. FRANZETTI: There are different forms.

MR. ETTINGER: Patches there are no problems with?

BY MR. ETTINGER:

Q. On Page 17 of Attachment 1 to your prefiled testimony -- I'm down to prefiled Question 21 here. I'm going to just --

MS. FRANZETTI: That's fine.

MR. ETTINGER: -- to try to honor the process. I'll go through my prefiled questions, then I'll go through some of your testimony and ask specific questions. So now I'm on 21.

BY MR. ETTINGER:

Q. On Page 21 of your Attachment 1 to your prefiled testimony you --

MS. FRANZETTI: I'm sorry, Albert. I don't want you to screw up your record. The first time you said it right. It's on Page 17, not Page 21.

BY MR. ETTINGER:

Q. Yeah, yeah. You see, you interrupted me and it screwed up everything. All right. We're starting over. This is the question.

On Page 17 of your Attachment 1 to your prefiled testimony, you state the most reliable indicator of in situ conditions are the indigenous communities present in the waterway. Did you study any of the indigenous communities in these waterways?

A. I did not study them directly, but EA

and MWRD did.

Q. What did you learn from those studies?

A. It's dominated by pollution-tolerant organisms.

Q. Is that in terms of fish?

A. Fish and invertebrates.

Q. Did you look at -- What invertebrate studies are you aware of in the record that you looked at?

A. The MWRD reports that surveyed the invertebrates.

Q. And those are up in the CAWS, right? Are you aware of invertebrates --

A. No. They have some that go downstream.

Q. Are you aware of any invertebrate studies taken in the areas where you did studies of sediment contamination?

A. Yes. They sampled in each of the pools.

Q. Do we know which study?

A. Lockport, Brandon, Dresden.

Q. And do we have IDI scores or something like that for those areas?

A. The data that I recall are just presenting the dominant taxa that were there.

Q. Do you know what studies you're referring to?

MS. FRANZETTI: That's why it's so hard if we don't have them written down. I don't know if Joe might be -- if you don't mind, Albert.

MR. ETTINGER: No. That's fine.

DR. BURTON: The most recent one I looked at Irwin Polls was a co-author on.

MR. ETTINGER: So that's probably a very old study.

DR. BURTON: It actually is in our list that we submitted for Exhibit 371 as No. 1, Bramier, Joel Bramier, et al. 2008.

MR. ETTINGER: He's spry.

MS. FRANZETTI: Albert, just a second. Joe, can you provide for the EA studies or no with -- I'm not trying to put you on the spot. Just if you happen to have something you can say it's at least got some of this data in it, that would be helpful.

MR. VONDRUSKA: Within the report

entitled final report Aquatic Ecologic Study of Upper Illinois Waterway, Volumes I and II. This is part of AS 9610, chapter --

MS. FRANZETTI: Let me jump in. I'm sorry. That is on CD No. 1, so you've got that.

MR. VONDRUSKA: And Chapter 7 discusses the macro invertebrate study that was conducted for this.

HEARING OFFICER TIPSORD: That's Exhibit 370, CD No. 1, Exhibit 370.

MS. FRANZETTI: Yes. The CDs themselves are 370, yes.

BY MR. ETTINGER:

Q. These are not generally wadable streams. So were these ponar studies or do you know how they took the samples?

MS. FRANZETTI: I think at this point we have to say we don't -- I don't think you were personally involved.

MR. VONDRUSKA: No. That was done by another contractor.

MR. ETTINGER: And do you know how they took it?

MR. VONDRUSKA: I can tell you in a second.

MR. ETTINGER: We can wait a second. We've waited for two years.

MR. VONDRUSKA: Ponar and hester-Dendy samplers.

MR. ETTINGER: Those are those things that you put at the bottom?

MR. VONDRUSKA: The artificial multiplate samplers.

BY MR. ETTINGER:

Q. Thank you. So we've got the 2008 study and that. Those are the studies that we know of that actually looked at the bugs in these areas; is that correct?

A. Yes.

MS. FRANZETTI: And, Albert, I would just add, I think there may be more, but I thought Mr. Seegert might have referred to something more, but that's what you can recall?

DR. BURTON: Yes.

BY MR. ETTINGER:

Q. Twenty-three: Have you studied the

effect of entrainment of aquatic life by Midwest Generation plants on the aquatic life in the Lower Des Plaines or the Chicago Area Waterway System?

A. No. I'm not sure how that's really relevant.

Q. Well, you answered the question, so we don't have to debate whether it's relevant or not.

Twenty-six: How does temperature, increased temperature caused by the operation of Midwest Generation plants affect dissolved oxygen levels in the Chicago Area Waterway System in the Upper Des Plaines -- or Upper Dresden Pool?

A. Can you quantify increase?

Q. Well, let's drop the -- let's -- I think that's fair. Let's just say in general, because it's a very general question. How does temperature affect dissolved oxygen levels?

MS. FRANZETTI: And as long as it's going to be used very generally, I don't have an objection.

DR. BURTON: It's -- less dissolved oxygen can be held in water where the temperatures are warm.

BY MR. ETTINGER:

Q. That's it for my prefiled questions. I'd like to combine these questions, but I'll probably get in trouble if I do, so I'll have to ask them one at a time. On Page 4 of your prefiled testimony, you say the lower area of Hickory Creek nearest to the Brandon tail waters does not support aquatic life or primary recreation uses due to impairments such as fecal coliforms, chloride, alteration to side stream or littoral vegetation flow alterations, sedimentation, siltation, total dissolver, suspended solids, zinc, nitrogen, phosphorus, and algae. Are you saying that there's no aquatic life in Hickory Creek?

A. No, I'm not.

Q. So what are you saying?

A. I'm just reporting what the Illinois EPA listed as sources.

Q. Is it your understanding that when Illinois EPA says that something does not support a use, an aquatic use, that there's no aquatic life there?

A. No.

Q. Have you studied the aquatic life in Hickory Creek --

A. No.

Q. -- other than reading --

MS. FRANZETTI: Let him finish his question.

MR. ETTINGER: I think slowly and you can think where I'm going, but you still have to let me finish my question.

DR. BURTON: Yes.

BY MR. ETTINGER:

Q. Have you studied Hickory Creek in any way other than looking at the U.S. -- I'm sorry -- Illinois EPA reports?

A. No, I haven't.

Q. Okay. So you're not aware of any Illinois Department of Natural Resources reports on biota in Hickory Creek?

A. No, I'm not.

Q. Okay. On Page --

MS. FRANZETTI: Albert, can I just ask one more follow-up to clarify. When you were using the phrase does not support in connection with Hickory Creek, were you mirroring the language that was used in the Illinois EPA 305(b), 303(d) list for whether

or not waters are impaired? Do you understand? Or was that too long a question? I'm just simply -- I'm simply asking you were you taking your "does not support aquatic life language" from the Illinois EPA's findings in the 305(b) 303(d) list to indicate an impairment for aquatic life use?

DR. BURTON: Oh, I thought --

MS. FRANZETTI: I'm sorry. No. I can't ask Albert questions. That question is for you.

DR. BURTON: Yes.

MS. FRANZETTI: Thank you.

MR. ETTINGER: Okay. Now that you understand who the question is addressed to, can you answer it, Dr. Burton?

DR. BURTON: My answer is yes.

BY MR. ETTINGER:

Q. Thank you. Now, on Page 5 of Attachment A, you refer to Grant Creek and Jackson Creek, and, again, you use the term does not support life due to unknown impairment sources, et cetera. I'm not going to read the whole thing. But as we discussed with Hickory Creek, where this says does

not support, is that narrowly based on your reading of IEPA reports and their classification of that water as not supporting aquatic life?

A. Yes, sir.

Q. Thank you. And as we said with Hickory Creek, you've not studied any other independent reports or made any independent study of the aquatic life in Grant Creek or Jackson Creek?

A. Correct.

Q. On Page 8 of your prefiled testimony, you refer to waters with high contaminants. It says a recent study by the USGS found that total PAHs in the sediments in the upper Illinois River basin are among the highest for sites nationwide and nearby sites in Western Springs and Riverside tributaries from the UBP --

MS. FRANZETTI: Upstream.

MR. ETTINGER: Upstream -- I was wondering why that preposition was there -- upstream from the UBP are among the highest 5 percent in the nation. Do you know where Western Springs and Riverside is in relationship to the area we've been focussing on?

DR. BURTON: Western Springs is a western suburb, and that's what USGS is calling their station for Salt Creek which empties into the Des Plaines River kind of in that Lockport area. And then Riverside is on the Des Plaines River, and it's just west of Cicero is about the best I can tell you.

BY MR. ETTINGER:

Q. Okay. And so they're in the upper December Plaines River?

A. Yes.

Q. Have you compared the aquatic life in the Upper Des Plaines River with the Lower Des Plaines River in any way?

A. I have not, but these studies indicated, which looked at benthic invertebrates, that it was degraded everywhere that urban land use was greater than 25 percent.

Q. Would you expect then to see the effects of this sediment or this highly toxic sediment according to your statement here on the aquatic life in the Upper Des Plaines?

A. Certainly.

Q. Moving now to Page 11 of your

testimony, prefiled testimony. You say, "While temperature in some cases can be a stressor." Have you personally seen any cases in which temperature was a stressor?

A. Yes.

Q. Where were they?

A. In some of the testing I did which I submitted and is in the summary report.

Q. And that's in the Lower Des Plaines?

A. Those specifically were lab studies that I was referring to that I did at different temperatures for extended periods.

Q. In your work in general, have you seen other systems, be they in Mexico or the Ukraine, in which temperature was a stressor?

A. It's another one of those well-known facts that streams that, for example, in urban areas where the riparian corridor is removed and there's no shading anymore and then suddenly there's sunlight, that those ecosystems will change dramatically with more algae being produced which then changes the benthic invertebrates which then changes the fish that are there. And that's urban run-off off of pavement is going to increase the

water. So, again, due to multiple factors in the urban environment, the elevated temperature with those other habitat issues has been shown to decrease the water.

Q. Have you specifically studied any systems other than the Lower Des Plaines in which there were heat influence from power plants?

A. From my personal research, no.

Q. Are you familiar with cold shock, the phenomenon cold shock?

A. Yes.

Q. What's your understanding of that?

A. Well, it effects me every time I try to do in situ testing during cold water temperatures, so I have to carefully acclimate my organisms.

Q. Okay. Well, actually, that might be interesting. How does that work? You have to -- What does that do to your organisms?

A. We are raising our organisms in the laboratory at about 23 degrees centigrade. If I go to a system that's more than two degrees cooler than that, I have to slowly acclimate them down in about 1 to 2 degrees an hour in order not to have cold

shock.

Q. Well, what happens if they have cold shock?

A. They die.

Q. So changing the temperature 2 or 3 degrees might cause your critters to die?

A. If it's rapid.

Q. If it's rapid?

A. So I can test those particular organisms that we've been talking about down to 10 degrees centigrade without any problem.

Q. Thank you. We're moving right along here.

This is, again, on Attachment 11. We've gone over various other sites with high contaminant levels, and you mention on Page 11 of Attachment 1 on the Des Plaines at Russell.

MS. FRANZETTI: Give me just a second.

DR. BURTON: I don't recall where Russell is.

MS. FRANZETTI: What page?

MR. ETTINGER: Page 11?

DR. BURTON: Yes? I do not recall where on the Des Plaines Russell is. I'm

going to assume it's upstream.

BY MS. WILLIAMS:

Q. I've lived in this area for 30 years, and I don't know where Russell is either.

A. Did you Google it?

Q. No. Does anyone else know where Russell is?

MR. SULSKI: It's at the border.

MS. FRANZETTI: Oh, it's Russell Road. It's right up at the Wisconsin border.

MR. ETTINGER: Up at the Wisconsin border. Okay. We --

MS. FRANZETTI: I think there's a Russell Road exit off the tollway.

MR. ETTINGER: You haven't looked at the aquatic life around Russell, have you?

DR. BURTON: No.

BY MR. ETTINGER:

Q. Now we're going to look at what has been marked, I believe, as Exhibit 372, which is the Upper Illinois Waterway Study Summary Report Sediment Contamination Assessment, December 18, 1995.

MS. FRANZETTI: Albert, do you think

he should try and pull a copy in front of him?

MR. ETTINGER: Yeah. That would be helpful.

MS. FRANZETTI: Albert, hang on. I think I gave away all my copies, but I think Dr. Burton has his. Just give us a second.

DR. BURTON: All right.

BY MR. ETTINGER:

Q. On Page 8 of the study, I guess I'll call it. It says -- I'll just call your attention to a sentence, the last -- second to last sentence in the first paragraph: These results suggest that the warmer upper waters of the thermal plume may be exerting a slight effect on some species. Do you know what the side effect for -- I just want to understand the plume. What do you mean by the plume and how does that work?

A. We had exposures that were in the upper water column at the bottom, and the temperatures were warmer in the upper because warm water rises. So I'm referring to organisms that are in that area. The depth of that would vary with plume.

Q. And this was actually in the plume of the power plant?

A. This is actually the discharge channel as I corrected yesterday. I was using the word plume probably incorrectly in my report.

Q. Okay. Well, okay. So it's in the discharge channel?

A. Right.

Q. You've never studied how the temperature comes from the discharge channel out into the river?

A. In the studies I referred to earlier today. We did have a couple of stations further downstream. We were monitoring temperature there. I didn't actually define the extent of the plume.

Q. And so actually within the discharge channel there's a temperature gradient?

A. During my study, yes.

Q. Okay. There's a sentence further down here. It says, ammonia production also increased in the sediment treatment from 15 to 35 degrees centigrade. What do you mean by ammonia production there?

A. Well, ammonia is produced by bacteria.

That's why I say production.

Q. So it's ammonia coming from the bacteria?

A. Right.

Q. Okay. Further on, the greater mortality in site water and sediment is compared to the control suggested other stressors; e.g., metals and/or organics in the samples increased the averse effects of continual exposure at 35 degrees centigrade. This effect did not appear to be related to ammonia since water concentrations of ammonia were low. The effects observed at 35 degrees centigrade do not occur in the UI -- likely do not occur in the UIW because organisms are not exposed to 35 degrees for seven-day periods.

Have you studied the -- First of all, could you explain that a little better? Maybe would be more helpful.

A. Sure. Those are talking about the laboratory exposures that we did where we maintained a constant temperature for seven days. We had the different treatments of just water at that temperature and then site water from different locations and then sediment with the water at

different locations. So we've got this relationship of greater effects at warmer temperatures if your waters from the river or sediments from the River were also present, greater mortality occurred.

Q. And that's roughly at 95 degrees Farenheit, 35 degrees centigrade?

A. Yeah. I have a hard time with Farenheit, but yeah, I think so.

Q. I have a hard time with centigrade, but I'm much older than you.

Okay. There's a couple -- on Page 10 there's something here I didn't understand at all. The first -- the last sentence of Page 9 and the second sentence -- and the sentence following that, the results of fractionalization showed that the polycyclic aromatic hydrocarbons, and ammonia were contributing to toxicity in the above Brandon Road sediment pore water, P promegalis and C denubias survival in unaltered sediments was 100 percent with the exception of C denubias survival of 75 percent in the above Brandon Road sample. The pore waters, however, killed all organisms within 24 hours. I don't -- what's being contrasted there and what's harmful and what's okay?

A. Okay. If I take the sediment and I squeeze out the water that's in it and I expose them to these organisms, none of them survive, 100 percent mortality. If I expose them just to water, they were okay, the overlying water, surface water was there. If I took the pore water that I squeezed out of the sediment and I put some of it through a fractionation, which means I kind of filter it with something that removed the PAHs and the other organica, suddenly survival improved. If I threw in some zeolite, which primarily was removing ammonia, survival improved. So the conclusion you reach from that TIE is that PAH as an ammonia were contributing to that pore water toxicity.

Q. In the sediment?

A. In the sediment.

Q. Okay. And so what we're really contrasting here on the pore water is water that's taken from the sediment as opposed to water column?

A. Yes.

Q. Now I understand.

MS. FRANZETTI: Actually, can I just ask a follow-up question? Why does one even test pore water? Why is that relevant to

aquatic toxicity?

DR. BURTON: The U.S. EPA and others have found that pore water is the dominant exposure route for benthic organisms. That's what they base their theoretical sediment benchmarks on.

MS. FRANZETTI: So it's another way of saying that the benthic organisms get exposed to the toxicity of sediment pore water?

DR. BURTON: Correct.

BY MR. ETTINGER:

Q. Further down on this page, the study states the Brandon Road tail waters possess highly desirable fish habitat and fish populations. Which were the highly desirable fish populations that are being referred to here?

A. I'm only mimicking or quoting what has been said by IEPA, that this is a very desirable fish habitat.

Q. Okay.

MS. WILLIAMS: Where?

MR. ETTINGER: I'm sorry. Maybe you were, but I -- this is your study and you don't cite them, so if you were only

mimicking them, I'm surprised.

DR. BURTON: I'm not a fish ecologist, so I'm relying on other people.

MS. FRANZETTI: What they're saying is did you do, meaning back when you wrote this, because you're still talking about -- he's still talking about this report. So are you relying on other information you'd been given that the Brandon Road tail waters had high quality habitat or did you study that?

DR. BURTON: I did not study that.

BY MR. ETTINGER:

Q. Okay. So that was in some -- something you had read prior to your writing this report led you to say that in this report?

A. Exactly, correct.

Q. But you can't remember what that was now?

A. No.

HEARING OFFICER TIPSORD: Excuse me, Dr. Burton. Would there be more detail on that since this is the executive summary he's asking you about? Would there be more detail on that than the report itself?

DR. BURTON: I'm sure I can provide a citation if I need to.

HEARING OFFICER TIPSORD: I'm just curious since it is the executive summary --

DR. BURTON: I don't know. It's -- I don't know.

HEARING OFFICER TIPSORD: That's fine.

MS. FRANZETTI: We'll try and look, you know. If we can find it and answer, we'll certainly provide that.

BY MR. ETTINGER:

Q. Well, this is probably in the same category on the top line of Page 11. This report states numerous species of waterfall and fish-eating birds and inhabiting the tail water area. Do you know that or were you just quoting somebody else again?

A. No. That was from me seeing that when I was out there. I spent a lot of time in the tail water.

Q. Okay. What are the waterfall and fish-eating birds that you observed there?

A. Well, I'm not an ornithologist, but there were lots of ducks, there was also a duck

blind, so obviously other people are hunting the ducks. There were belted king fishers, and -- it's been 15 years. I didn't take field notes on.

Q. Have you been back there in the last 15 years?

A. It was the late '90s, probably '99.

Q. Okay. I'm winding right down here, and we'll be done by lunch depending on what else other people have.

Give me one second. I'm done.

MS. FRANZETTI: Miss Tipsord, just a couple of things.

THE COURT: Sure.

MS. FRANZETTI: I realized last night that the map that is on CD No. 2 which is No. 8, the last document on CD No. 2 was the wrong map in the sense that there's one for lakes and there's a separate one for streams, so I'd like to move to enter the correct map for streams; lakes is pretty irrelevant here to the Des Plaines into evidence in substitution for No. 48 on the CDs. And this was also the map we were referring to the other day actually that has the numbering

segments for segments of the Des Plaines River that are used in the Appendix B to the 305(b) reports that contains the 303(d) impaired waters.

HEARING OFFICER TIPSORD: If there's no objection I've been handed what is titled Figure 2A Des Plaines River was watershed 303(d) listed waters 2002. I'll mark that as Exhibit 381.

MS. FRANZETTI: And last matter of business, I believe that I deferred moving for the full admission of CDs 1 and 2 yesterday when Agency counsel objected initially.

HEARING OFFICER TIPSORD: But I went ahead and admitted them. I admitted them.

MS. FRANZETTI: Thank you.

HEARING OFFICER TIPSORD: Subject to objection to specific documents as they came up.

MS. FRANZETTI: Okay.

HEARING OFFICER TIPSORD: So they have been admitted. Seeing no objection to Exhibit 381, it is also admitted.

Anything else?

MS. FRANZETTI: I have nothing further.

HEARING OFFICER TIPSORD: Is there anything else for Dr. Burton?

Dr. Burton, thank you very much.

DR. BURTON: Thank you.

HEARING OFFICER TIPSORD: Also thank Mr. Goodfellow. Mr. Vandruska, it was good to see you again. We are adjourned. There will be a hearing officer order about the February 5 prehearing conference. Thank you.

(Which were all the proceedings had.)

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STATE OF ILLINOIS)
) SS.
COUNTY OF COOK)

I, LAURA MUKAHIRN, being a Certified Shorthand Reporter doing business in the City of Chicago, Illinois, County of Cook, certify that I reported in shorthand the proceedings had at the foregoing hearing of the above-entitled cause. And I certify that the foregoing is a true and correct transcript of all my shorthand notes so taken as aforesaid and contains all the proceedings had at the said meeting of the above-entitled cause.

Laura Mukahirn
LAURA MUKAHIRN, CSR
CSR NO. 084-003592