

ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:)
 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

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STATE OF ILLINOIS
 Pollution Control Board

REPORT OF THE PROCEEDINGS held in the
 above entitled cause before Hearing Officer Marie
 Tipsord, called by the Illinois Pollution Control
 Board, taken by Steven Brickey, CSR, for the State
 of Illinois, 100 West Randolph, Chicago, Illinois,
 on the 15th day of April, 2009, commencing at the
 hour of 9:00 a.m.

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REPORTED BY:

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1 MS. TIPSORD: Good morning everyone.
2 Let's go on the record. My name is Marie Tipsord
3 and I've been appointed by the Board to serve as
4 hearing officer in this proceeding entitled Water
5 Quality Standards and Effluent Limitations For The
6 Chicago Area Waterway System and Lower Des Plaines
7 River. These are proposed amendments to 35 Ill.
8 Adm. code 301, 302, 303 and 304. This is docket
9 number R08-9.

10 With me today to my immediate
11 right is acting chairman G. Tanner Girard, the
12 presiding Board Member. To his right is
13 Dr. Shundar Lin. To Dr. Lin's right is Andrea
14 Moore and to her right is Board Member, Gary
15 Blankenship. To my far left is Board Member,
16 Thomas Johnson. To my immediate left is Anand Rao
17 and to his left, Alisa Liu, from the technical
18 unit. Also today Brian Lamble, our extern for
19 this semester -- one of our two externs this
20 semester is with us today in the audience.

21 We spoke a little bit off the
22 record about the hearing schedules for May 5th and
23 6th and, in particular, with moving Alan
24 Mammoser's testimony to a public comment. At this

1 point in time, the plan is that Marilyn Yates will
2 begin on the 5th and if time permits Thomas
3 Bamonte and Margaret Frisbie will testify and then
4 it will be James Huff and if time does not permit
5 to get to William Van Bonn today, he will testify
6 on May 6th.

7 We are continuing to hear
8 testimony from members of the public and today the
9 purpose is to hear the testimony from two or three
10 witnesses. Those witnesses are Marc Gorelick --
11 am I pronouncing that correctly?

12 MR. GORELICK: Yes.

13 MS. TIPSORD: And Peter Orris and
14 they will be heard from as a panel and then if
15 time permits, William Van Bonn. The testimony
16 will be marked as an exhibit and entered as if
17 read. After marking the pre-filed testimony as an
18 exhibit, we will then proceed to the questions for
19 the testifier and we will start with the
20 Metropolitan Water Reclamation District of Greater
21 Chicago and then the IEPA.

22 Anyone may ask a follow-up
23 question and you need not wait until your turn to
24 ask questions. I do ask that you raise your hand,

1 wait for me to knowledge you. After I have
2 acknowledged you, please state your name and who
3 you represent before you begin your questions.
4 Please speak one at a time. If you are speaking
5 over each other, the court reporter will not be
6 able to get your questions on the record. Please
7 note that any question asked by a Board Member or
8 staff are intended to help build a complete record
9 for the Board's decision and not to express any
10 preconceived notion or bias. At this time,
11 Dr. Girard.

12 MR. GIRARD: Good morning. On
13 behalf of the Board, I welcome everyone to hearing
14 day 25 in this rulemaking. Thank you for the
15 extensive time and effort everyone has invested in
16 this rulemaking that will help the Board build a
17 record for decisions. We look forward to your
18 testimony and questions today.

19 MS. TIPSORD: And with that, is
20 there anything else? Ms. Alexander, would you --
21 do you want to swear your witnesses in or do you
22 have an opening statement?

23 MS. ALEXANDER: We don't have an
24 opening statement. I'm going to present their

1 testimony for --

2 MS. TIPSORD: Okay. Let's swear in
3 the witnesses then.

4 WHEREUPON:

5 DR. PETER ORRIS & DR. MARC GORELICK
6 called as witnesses herein, having been first duly
7 sworn, depose and saith as follows:

8 MS. ALEXANDER: I would like to have
9 marked as an exhibit the testimony of Dr, Gorelick
10 and the testimony of Dr. Orris pre-filed in this
11 proceeding and copies.

12 MS. TIPSORD: We just need one to
13 mark as an exhibit. If there's no objections, I
14 will mark the pre-filed testimony of Dr. Gorelick
15 as Exhibit 233 and the pre-filed testimony of
16 Dr. Orris as 234. Seeing no objection, they're
17 marked.

18 And all the pre-filed includes
19 all the attachments to their testimony. And with
20 that, I think we're ready to proceed to questions
21 and we'll start with the District.

22 MR. ANDES: Thank you. We'll start
23 with the questions for Dr. Orris. On page one of
24 your testimony, it states "no single epidemiologic

1 study, no matter how well designed and executed,
2 no matter what the ultimate result, is sufficient
3 basis to refuse to address water borne pathogens
4 in the CAWS." Would you recommend that regulators
5 make the decision without the benefit of
6 epidemiologic studies?

7 MR. ORRIS: Certainly not.

8 MR. ANDES: So what do they need in
9 order to make a decision?

10 MR. ORRIS: Well, first of all,
11 thank you very much for inviting me today. I
12 appreciate this opportunity and thank you for your
13 service on this Board. These are very important
14 issues that you are coping with and often outside
15 of the public limelight so I appreciate that. For
16 those of us in the academic field in environmental
17 health, we are very happy that those of you are
18 serving in this way and making these decisions.

19 Having said that, what do I
20 think you need to take into account when you are
21 arriving at regulatory decisions in this specific
22 matter? Certainly, epidemiologic studies are
23 helpful and these studies should help as one piece
24 of evidence guiding your approach to understanding

1 what risks and benefits there are from your
2 decisions. The problem with epidemiologic studies
3 as you know, as with any science, is they try to
4 approximate the world around us and try to educate
5 us as to what are the risks and benefits in the
6 world around us, but they are limited because they
7 are based on people and they are looking at the
8 world around us. We are not able to look
9 epidemiologically at controlled studies in which
10 people are placed in certain environments and one
11 can control those environments entirely.

12 Having said that, even the best
13 epidemiologic studies have -- always have problems
14 in their ability to identify actual events and
15 actual relationships that are really there. And
16 that's characterized, in general, by an assessment
17 of the power of that study. The power of the
18 study means how likely is it when we look at a
19 study and when this study looks at a problem and
20 looks for a relationship how likely it is given
21 the design of the study and the size of the study
22 that we will actually see a relationship if it is
23 there. Otherwise, called how large is a false
24 negative or whatever and by convention and with

1 respect to this quite excellent study that
2 Dr. Dorevitch is projecting, the standard that we
3 set is based on our preconceived, at priority
4 judgments that we hope that the power will be 80
5 percent.

6 In other words, if there's a
7 real relationship, we will see it 80 percent of
8 the time and we will miss it 20 percent of the
9 time. By definition, this is not as stringent as
10 we place on the reverse side and that is in the
11 study if there's a relationship how likely is it
12 that we are going to see it erroneously? We'll
13 see the relationship, but, in fact, it will be due
14 to something else. That's the sensitivity of that
15 study and we set that standard higher on the basis
16 that we understand that epidemiologic studies help
17 us identify relationships and help us less in
18 ruling out relationships that may well exist.

19 So, for one, epidemiologic
20 studies in and of themselves are limited by the
21 science of that and this study, while excellent,
22 is limited by those same things. In addition,
23 this study, and epidemiologic studies in general,
24 look at rather large homogeneous populations so

1 that if you have subpopulations at particular risk
2 in this study design, you will lose their risk
3 within the overall grouping here and this study
4 talks about adults. It talks about population in
5 general. It does not discuss the subsections of
6 small children, young children, who may be using
7 these waterways in more depth or more --

8 MR. ANDES: Are you aware of any way
9 in which they're excluding those people?

10 MR. ORRIS: No, they are included
11 but the problem is when you put them in with the
12 9,000 you're looking at you lose that particular
13 aspect when you don't look particularly at that
14 group. And the problem with looking at that
15 group, as you know, is you get smaller and smaller
16 populations and, therefore, your power to see a
17 real relationship in a smaller population is much
18 more difficult. So that's the second aspect of
19 this particular study that is problematic. It
20 doesn't mean it's a bad study. It's an excellent
21 study. We support that study. We support this
22 further review. It may demonstrate despite those
23 problems, things we need to look at with respect
24 to those waterways and what ought to be done about

1 it, but it is only one piece of the overall
2 puzzle.

3 And, unfortunately, you have
4 quite a high threshold here. You have one of the
5 oldest known associations between the environment
6 and disease and that is the ingestion of pathogens
7 from water. We have known since antiquity that
8 the injection of pathogens from water causes
9 disease. We have known for many years that one of
10 the most important public health initiatives, one
11 of the most important public health preventive
12 measures taken in the last 100, 200 years is the
13 disinfection of water when it comes into contact
14 with human beings in a variety of ways.

15 Having said that, then we also
16 have a standard adopted throughout the country and
17 much of the world that says that these waterways
18 ought to be disinfected and that recreational
19 waterways of this sort ought to be disinfected.
20 And, finally, we have what looked to me to be a
21 very balanced recommendation from the IEPA on it
22 also.

23 So to overturn all of that
24 weight, if you will, you need to have considerable

1 evidence. You need to have evidence that this
2 known risk is for some reason not going to be
3 applicable in these particular waterways. And
4 that's a high standard and one epidemiologic study
5 no matter how well adjusted cannot meet that
6 standard. You must put together the weight of
7 evidence here. Thank you.

8 MS. TIPSORD: Excuse me, Mr. Andes.
9 I would just like to point out for the record that
10 Dr. Dorevitch's testimony was entered as Exhibit
11 100 for those of you who might want to look back
12 and are looking at the transcript.

13 MR. ANDES: You're aware, Dr. Orris,
14 that current EPA bacterial criteria are based on
15 one epidemiological study, correct?

16 MR. ORRIS: I'm aware in your
17 questioning that there is an EPA regulation based
18 on an epidemiologic study that discusses how to
19 titrate the issue of clean water. It doesn't
20 discuss whether or not to use this appropriate
21 preventive measure.

22 MR. ANDES: Are you saying the 1986
23 criteria are not based on one epidemiological
24 study and we've provided an exhibit with the

1 bacteria criteria document and are you saying that
2 that's not based on one study?

3 MR. ORRIS: No, I don't think that's
4 what I said.

5 MR. ANDES: Okay. Are you aware
6 that the CHEER study, the UIC study, which you
7 have now -- and is an excellent study -- measures
8 water quality in more ways than the study used for
9 the EPA criteria?

10 MR. ORRIS: The CHEER study looks at
11 the question of symptoms which is the most
12 appropriate way of looking, but there are great
13 limitations in that. It uses a number of other
14 methodologies which are state of the art in
15 respect to that. As to what the 1986 EPA
16 regulation was entirely based upon, I can't say.

17 MR. ANDES: I was also going to ask
18 some other questions. In terms of the fact that
19 you always see reports of stool samples unlike the
20 EPA criteria study. It quantifies water exposure
21 and for this water body, correct? 9,000
22 participants for this water body as opposed to a
23 national scale study?

24 MR. ORRIS: Yes.

1 MR. ANDES: Okay. You're aware --
2 are you aware that NRDC has signed a settlement
3 agreement with EPA concerning the Beach Act
4 criteria which specifically requires EPA to
5 conduct epidemiological studies to be used in
6 developing water quality criteria?

7 MR. ORRIS: Of course. Having read
8 it, and I'm not an expert in all these aspects of
9 water control here. It looks quite complete to
10 me. It has epidemiologic studies. It looks at
11 subpopulations. It does monitoring. It does a
12 whole wrath of -- or they commit themselves to a
13 whole wrath of investigations that are most
14 appropriate for this problem.

15 MR. ANDES: And you're aware that in
16 this record in addition to the epidemiologic study
17 which has been discussed in Dr. Dorevitch's
18 testimony and will be available early next year
19 there has been risk assessment information and
20 other information provided to the Board all which
21 I imagine you think should be considered in
22 considering the totality of the information?

23 MR. ORRIS: Certainly.

24 MR. ANDES: Okay. As to this

1 particular water body and particularly the
2 secondary contact recreation that we're talking
3 about here, are you aware of any studies published
4 that discuss how much water people swallow during
5 those types of activities?

6 MR. ORRIS: There's a lot of -- in
7 what I still consider to be minimal epidemiologic
8 information about recreational water use there is
9 in the introduction discussions about how the
10 water is used, how much people may be ingesting in
11 the process. There's not quantification.
12 Obviously, if you're wind surfing on the St.
13 Lawrence River, one of the studies we're all aware
14 of, to have a wind surfer quantify how much
15 they're ingesting in that process is somewhat
16 difficult on a whole variety of levels. Though,
17 we do know now from that study that there is a
18 correlation between that and indications that they
19 are exposed to bacteria and other pathogens from
20 that process.

21 MR. ANDES: And would you think that
22 the contacts made during wind surfing may be
23 different than the contacts made during some of
24 the activities that take place on the CAWS which

1 do not include wind surfing?

2 MR. ORRIS: Well, you had that
3 strange word in there "some". Obviously, some
4 could be different. If you're saying all, if
5 you're saying are there activities that may be
6 frequently done in the waterways that may parallel
7 the amount of exposure as wind surfing or as the
8 rowing, kayaking and other studies, I would say
9 absolutely there will be activities on these
10 waterways that will parallel some of these other
11 studies that should inform us or rather these
12 other studies should be part of our consideration
13 or part of the Board's consideration when they
14 look at this.

15 MR. ANDES: In fact, the CHEER study
16 is specifically looking at the exposures that
17 people are undergoing on the CAWS system, correct?

18 MR. ORRIS: Yes, absolutely.

19 MR. GORELICK: If I might add.
20 There are -- I'm aware of no studies that have
21 looked at the amount of water that's ingested
22 during secondary contact recreation such as
23 boating. There are studies that have looked at
24 how much water is swallowed during swimming, some

1 good data, that shows a substantial amount of
2 water is ingested and quite a bit more by children
3 than adults, which raises the question of children
4 as a particularly susceptible subgroup, which I'm
5 sure we'll get to.

6 But to get to your point, it is
7 very likely that different activities will, in
8 fact, have different levels of risk which is one
9 of the issues with the CHEER study that all
10 activities are being looked at together in this
11 power calculation. There are 9,000 subjects for
12 all activities combined. If some of those
13 activities are riskier than others, there will be
14 less power to determine whether or not, for
15 example, kayaking is different from powerboating
16 or fishing and that's another concern about that.

17 MR. ANDES: And that will depend --
18 and it will depend partly on the results of the
19 study?

20 MR. GORELICK: Correct.

21 MR. ANDES: The larger the subgroup
22 among those 9,000 that do those particular
23 activities, the more confident we'll be of the
24 results.

1 MR. GORELICK: Correct. And the
2 smaller the subgroup, the less confident.

3 MR. ANDES: Okay.

4 MR. ORRIS: But you need to
5 understand that a positive result of the study
6 means that the power is not as relevant as it was
7 for a negative study. A positive result means
8 that despite the fact that it was perhaps less
9 likely you were going to see the relationship, you
10 saw it and it's there. And then only the false
11 positive is of significance.

12 MR. ANDES: Yes. Thank you. On --
13 Dr. Orris, on page two of your testimony you state
14 regarding the precautionary principal. That a
15 community should not hesitate to install a traffic
16 light on a street corner because an
17 epidemiological study indicated that only one
18 child in the neighborhood was likely to die at the
19 corner each decade if every one obeyed the speed
20 limit. This reality is reflected in the proposed
21 regulations of IEPA. Let me explore that analogy.
22 Would you recommend that if the Department of
23 Public Works had information suggesting that a
24 child might die at every intersection unless a

1 traffic light was installed we should install
2 traffic lights at every intersection?

3 MR. ORRIS: Having read your
4 questions in depth on this question of street
5 lights is not extraordinarily relevant within the
6 river, at the moment anyway. I would only try to
7 head off this line of discussion from the
8 following point of view. This was an illustrative
9 example.

10 What I was trying to communicate
11 was you have to balance the seriousness of the
12 individual event that may occur relating to some
13 regulatory decision that you may be making. You
14 have to balance that with the difficulty with
15 respect to an epidemiologic study which tends to
16 homogenize the population and gives us a risk over
17 a large group of people. And if the serious
18 enough -- if the event is serious enough and the
19 subgroup is at risk enough, a public body may well
20 want to make a decision purely on the possibility
21 or on a low likelihood of risk. And that's the
22 issue with respect to a child dying because a car
23 hits them at a street light. I'm not going to
24 have a discussion about which streets should have

1 lights, which corners shouldn't. That's way
2 beyond my expertise and I suspect not terribly
3 relevant to this.

4 That was an example of the
5 problem before a board such as yours and other
6 regulatory board's and that's what you have to
7 weigh. I'm here to help with an understanding of
8 the question as to whether or not a single
9 epidemiologic study can be used as the basis,
10 especially a single negative epidemiologic study,
11 can be used as the basis for a regulatory decision
12 to overturn current approaches and policies that
13 are well established.

14 MR. ANDES: Dr. Orris, is any one
15 here suggesting or has said in writing that this
16 should be the sole basis for the decision by the
17 Board?

18 MR. ORRIS: What I take to be the
19 question I'm asked is should the Board rely on the
20 CHEER study as the basis for making their
21 regulatory decision within this situation and that
22 is what I am specifically talking about. In fact,
23 when I read my colleague, Dr. Dorevitch's
24 excellent testimony about his -- I want to say

1 again, his excellent study. And we appreciate the
2 fact that you came to the U of I to secure such an
3 excellent study.

4 MR. ANDES: As the brother of an
5 alumnus, I appreciate that as well.

6 MR. ORRIS: Good. Having said that,
7 reading his last line within his system and
8 perhaps this was overstated unintentionally, but
9 he does say that this is the -- that this should
10 be the basis for consideration here. "The" is the
11 word I take issue with.

12 MR. ANDES: Your --

13 MR. ORRIS: It should certainly be a
14 basis.

15 MR. ANDES: So your quarrel is with
16 that one word in Dr. Dorevitch's testimony?

17 MR. ORRIS: I'm sorry?

18 MR. ANDES: Your quarrel is with
19 that one word in Dr. Dorevitch's testimony.

20 MR. ORRIS: Yes. The rest I thought
21 I have some differences with, but he has high
22 quality testimony.

23 MR. ANDES: Now, when you talk about
24 balancing, it sounds like there are other factors

1 the Board should consider. Would one of them be
2 if you have a particularly sensitive population
3 that you explore opportunities to risk exposure.
4 For example, would you tell particularly sensitive
5 populations don't go in that water body?

6 MR. ORRIS: Yeah. I am appreciative
7 of our difficulty today in having tools to protect
8 individuals without changing the environment in
9 this recreational use of water. What do I mean by
10 that? I am particularly interested in the CDC's
11 recommendation that relies heavily on education
12 about how you handle yourself in a variety of
13 different waters with bacterial contamination. In
14 general, we find personal education and the effort
15 to have personal individuals not behave in certain
16 ways not an effective means of preventing
17 environmental exposures. Many of the exposures in
18 this setting are accidental. Many of the
19 exposures in this setting may come from behaviors
20 that are in general okay, but in one situation may
21 be a problem.

22 And I think they're
23 characterized by the signs you see on that river
24 now that tells everybody who is going up and down

1 the river kayaking or whatever don't open your
2 mouth. You know, I mean it says don't swallow the
3 water. Be very careful. Don't fall in, et
4 cetera. That's a real problem when you have to
5 rely on that to protect people. It is a problem
6 because it doesn't work and it's probably not
7 possible for those people to do.

8 MR. ANDES: It's not possible for
9 these people to do what?

10 MR. ORRIS: It is probably not
11 possible --

12 MR. ANDES: Is it possible --

13 MS. TIPSORD: You have to let him
14 finish.

15 MR. ANDES: Sorry.

16 MR. ORRIS: And I'm sorry for taking
17 a while on this, but I think it's important that
18 it is not possible for individuals who are
19 recreationally using the water to prevent some of
20 the exposures that the signs tell them to do,
21 especially young people, especially people who are
22 involved with quite active activities there. It
23 reminds me to some degree -- well, nevermind. Tom
24 Lehrer was very popular when I was in college and

1 there was a song he had about how to protect
2 yourself from pollution and it was "Don't drink
3 the water and don't breathe the air." That
4 doesn't work in a setting in which we can take
5 appropriate, preventive public health measures.

6 MR. ANDES: Let me ask a couple
7 questions.

8 MS. WILLIAMS: Can I ask a follow up
9 real quick. Good morning. I'm Debra Williams
10 from the Illinois EPA. Dr. Orris, I'd just like
11 to ask a quick follow up.

12 MS. TIPSORD: You need to slow down.
13 You're words are mashing together through the mic.
14 Go ahead.

15 MS. WILLIAMS: Are you aware,
16 Dr. Orris, whether this Pollution Control Board
17 has any regulatory purview over controlling
18 recreation, who can recreate on the waterways and
19 what activities they can perform?

20 MR. ORRIS: I'm aware that there are
21 regulated activities. In other words, no one is
22 supposed to be swimming within these waterways and
23 that is not a topic for this nor the
24 recommendation from the Illinois EPA in this

1 situation. I'm also aware that in the
2 observational studies that regulation appears to
3 be valid because nobody saw anyone swimming in
4 these prefatory studies from Dr. Dorevitch, et
5 cetera.

6 MS. WILLIAMS: My last question is
7 whether you understand one way or the other as
8 whether the Board can prohibit, even from
9 swimming, can the Board prohibit people from going
10 into these waters? Is that part of their role?
11 Do you know the -- answer, yes or no. I don't
12 know.

13 MR. ORRIS: You mean going into
14 these waters for recreational purposes?

15 MS. WILLIAMS: For any type.

16 MR. ORRIS: I don't know the limits.
17 My assumption is that the Board advises the agency
18 that takes the action, but that's outside of my
19 purview, if you will.

20 MS. WILLIAMS: Thank you.

21 MR. ANDES: Dr. Orris, as opposed to
22 breathing and drinking water recreating in the
23 CAWS is a conscious choice, correct? People don't
24 have to recreate there. They can either not

1 recreate or they can recreate in other ways or
2 other waterbodies in the areas, correct?

3 MR. ORRIS: Yes.

4 MR. ANDES: So if we're talking
5 about balancing risk, which is what we talked
6 about as not so much a regulatory matter, but
7 balancing a number of issues, there are -- in
8 terms of these particular sensitive populations,
9 one of the factors to consider might be that a --
10 particularly with a water body that has limited
11 access points, that one of the ways to address the
12 risk of those people is for those people whether
13 they're pregnant, amino compromised or other
14 sensitive populations, to not go in that water
15 body at all?

16 MR. ORRIS: The advice you're saying
17 is one of your policy options is to put one of
18 those signs on that limit access or a policeman
19 there or -- I'm not clear.

20 MR. ANDES: I think there are a
21 variety of options.

22 MR. ORRIS: For these communities in
23 and along these waterways, which I consider to be
24 one of the advantages of living in Illinois and on

1 these waterways as they become cleaner and
2 cleaner, you're saying that you would take
3 somebody living on the north branch of the Chicago
4 River and tell them "Well, you can go kayaking in
5 the Fox or maybe even in the Mississippi. They
6 should drive out there. I'm not clear as to what
7 you're asking me.

8 MR. ANDES: You're aware that
9 there's a lake, too?

10 MR. ORRIS: Yes. As a matter of
11 fact, being a cochair of the Health Professionals
12 Task Force of the International Joint Commission,
13 we're looking at some of these similar issues from
14 the question of the lake usage and having some of
15 the same problems that the Board is having with
16 respect to them. Having said that, we have
17 similar problems there. I would hope that the
18 citizens of Illinois have access to all of these
19 resources possible.

20 MR. ANDES: And when we look
21 particularly at the CAWS, you're aware that
22 independent of the outcome of this rulemaking
23 there are hundreds of combined sewer overflow
24 discharges. There is other storm water runoff and

1 that those will not be largely addressed through
2 the TARP program for, say, 15 years or so?

3 MR. ORRIS: Yes. And, again, that's
4 one of those issues. We're also having to cope
5 with the Great Lakes' water quality and I
6 understand we're building a rather deep tunnel to
7 try to deal with those because they need to be
8 dealt with as best as we can in that situation.

9 There's also interesting new
10 aspects of that that we're looking at and that is
11 the question of pharmaceuticals in this runoff and
12 other things of this sort. So there's a whole
13 variety of issues here that are very difficult and
14 very important for us.

15 MR. ANDES: So does disinfection
16 from the three District facilities remove any of
17 that bacterial loading from the waterbodies?

18 MR. ORRIS: Well, when you say any,
19 again, you're using these sort of global terms.
20 Yes, certainly, any if it's appropriately done,
21 especially with UV, but let me --

22 MR. ANDES: Well --

23 MR. ORRIS: Having said that, all
24 probably are not experienced and the data, the

1 outbreaks in Milwaukee, et cetera, would tell us
2 that overwhelms much of the system when it occurs.

3 MR. ANDES: Let me go back because
4 that's not really the question I was asking.

5 MR. ORRIS: I'm sorry.

6 MR. ANDES: My question was
7 disinfection at the three District plants, does
8 that address in any way bacterial loadings from
9 the combined sewer overflows or the storm water
10 runoff?

11 MR. ORRIS: Well, again, you're
12 saying any way. I have a hard time dealing with
13 these global statements.

14 MR. ANDES: I can offer --

15 MR. ORRIS: When you disinfect,
16 you're dealing with some of the bacterial load and
17 some of that bacterial load will come from run
18 off, et cetera.

19 MR. ANDES: We're still not reaching
20 the same point. As a matter of fact, combined
21 sewers and storm water runoff are not addressed by
22 this rulemaking. The District's effluents are
23 addressed by this rulemaking. So I'm just trying
24 to clarify, disinfecting the District's effluents

1 does not address any of those other sources?

2 MR. ORRIS: Then I suppose my
3 confusion is in your word address and then I would
4 agree with you that this rulemaking from my
5 understanding, although, again, this is at the
6 Board and not by contribution here, from my
7 understanding, is meant to handle -- is not meant
8 to handle what you're talking about.

9 MR. ANDES: So those bacterial
10 contributions will remain independent of this
11 rulemaking and potentially affect, in your mind,
12 the people recreating in the CAWS?

13 MR. ORRIS: Well, you're asking
14 legal questions relating to a scientific aspect.
15 If some of this stuff goes into the river, some of
16 it will be handled by the disinfectant process
17 that is in place if you're using chlorine, let's
18 say. If you're using UV, it may or may not handle
19 that depending on where things flow. Having said
20 that, as a caveat, I agree with you that this is
21 not designed to address those issues in the way
22 that you've said it and, in fact, we will still
23 need to take precautionary approaches to those
24 events. So that, for instance, the kind of thing

1 we're considering with respect to beaches is what
2 kind of modeling do you need to be able to say the
3 beach should be shut down today and not three days
4 later when you get the results back from the lab.

5 MR. ANDES: So if we're talking
6 about that there's a current need to tell people
7 not to open their mouths, take precautions in the
8 CAWS, even if you were to disinfectant the three
9 treatment plant effluents, which you've
10 acknowledged doesn't remove all bacteria and
11 doesn't remove all viruses and we've had testimony
12 about that and the other sources, combined sewer
13 overflows, which are completely unaddressed by
14 this rulemaking, storm water runoff, which is
15 completely not addressed by this rulemaking, you
16 would leave the same precautions in effect as
17 there are present now because there's still
18 bacterial loads in the water body?

19 MR. ORRIS: We need to look at how
20 we make those educational precautions and those
21 signs effective. We know that the current
22 approaches are not effective.

23 MR. ANDES: How do we know that?

24 MR. ORRIS: Well, we know that from

1 the assessment of the small studies that are done
2 of this kind of use of contaminated water. In
3 fact, lower levels than these contaminations have
4 been identified and the fact that that's
5 incorporated into people and has produced
6 symptomatic disease. So we know that this type of
7 use of this type of contaminated water is a
8 problem and it needs effective preventive
9 measures. And, again, a sign that says "Keep your
10 mouth shut. Don't swallow anything," to a kayaker
11 or wind surfer is not effective public health. It
12 may be the only thing we have available now, but
13 long term, we have to come up with better
14 approaches.

15 MR. ANDES: As to the CAWS itself, I
16 gather we'll have a better sense through the
17 questions in the CHEERS study as to what extent
18 those precautions have affected people's habits,
19 correct?

20 MR. ORRIS: Again, this goes over
21 what we previously talked about with respect to
22 the study. We may learn some very important
23 things from that study about the water use, et
24 cetera. If we do not see a relationship that we

1 have previously seen in other studies and that,
2 again, we understand based on the medical of
3 infectious disease, et cetera for over 200 plus
4 years, since antiquity, in fact, then we have to
5 look again to see how we might redesign further
6 studies to understand more about this. In other
7 words, a negative study that tells us that we
8 missed this does not rule out that 20 percent
9 possibility, but we've gone through this.

10 MR. GORELICK: If I might add
11 because this question was raised to me as well in
12 the pre-filed questions. So the proposed
13 rulemaking addresses one aspect of pollution in
14 the CAWS, which is effluent from the treatment
15 plants. It does not address pollution from
16 combined sewer overflows and storm water runoff.
17 Those are time limited events. They're wet
18 weather events as opposed to the discharge, which
19 is an ongoing event.

20 So I think the point to make is
21 that the proposed rulemaking, we believe, will
22 diminish the risk for recreators in the CAWS. It
23 is not intended to eliminate that risk because it
24 doesn't address all the sources of risk. We

1 distinguish between making the water safe versus
2 making it safer and I think that's the point to
3 make and I would agree with you that the proposed
4 rulemaking does not, in fact, eliminate risk to
5 recreators, especially during wet weather events
6 for that reason.

7 MR. ANDES: So people would still
8 need to take all the same precautions they
9 currently take because there are wet weather
10 events and the effects of those last for some
11 time, correct?

12 MR. GORELICK: The duration of that
13 effect I'm aware of there. It is a time limited
14 duration. There is some data looking at water
15 quality after storms, for example, showing that
16 there is a relatively quick return. People are
17 generally not recreating during the wet weather
18 event itself. There would potentially need to
19 be -- the need to take additional precautions or
20 restrictions or whatever regulators decide and
21 that's not a decision for me to make. The
22 question is how do we assess what the risk is with
23 and without proposed rules and to what degree can
24 we reduce it and determine if that reduction has

1 occurred.

2 MR. ANDES: Let me clarify because
3 one of the things we've heard here in these
4 hearings is the potential that there could be much
5 greater risk if the waters were made safe. You're
6 not saying the waters are going to be made safe.
7 You're saying the risk would be less if these
8 waters -- if these plants -- discharges are
9 disinfected, risk would not be removed, there
10 would still be bacterial loadings in the water
11 body and people would still need to take the
12 appropriate precautions?

13 MR. GORELICK: Correct.

14 MR. ANDES: Let me go back to the
15 balance that we've talked about in terms of
16 considering a variety of factors. One of the
17 issues that we've talked about here has been that
18 treatment of these discharges would involve
19 installation of pollution controls that's would
20 have significant energy use and testimony has been
21 provided regarding the effects of that in regards
22 to air emissions and carbon footprint effects.
23 Would you agree that before considering a balance
24 that those would be relevant factors for the Board

1 to consider whether installing these controls
2 would have potential adverse impacts in other
3 meetings?

4 MR. ORRIS: Absolutely. Especially
5 with respect to the carbon footprints. Certainly,
6 the Board should consider the fact that we ought
7 to be moving away from energy generation from
8 these high carbon footprint methods to begin with
9 with all due respect to Illinois coal and fossil
10 fuel generation, but I'm afraid that individual
11 protective measures like this cannot wait on the
12 overall society movement towards wind turbines or
13 others for that. And the assumption about where
14 you would get your energy to do this would be, I
15 think, beyond what needed to be considered within
16 this discussion. I should add, though, that as
17 long as you raised global warming, the question of
18 increasing the microbial and infectious disease
19 burden in this area as temperature warms is
20 something that we in public health have been
21 looking at over a period of time and there are
22 numbers of water borne diseases that are now in
23 the southern states that may well move into the
24 Great Lakes over a period of time that we're quite

1 concerned about.

2 MR. ANDES: Thank you. Let's move
3 on. On page three of your testimony, there's a
4 discussion about sensitive populations and contact
5 with sewage contaminated water. Are you aware
6 that in many waterborne disease outbreaks, most,
7 in fact, the CDC has reported as associated with
8 treated water? In other words, swimming pools,
9 spas, wading pools, et cetera.

10 MR. ORRIS: Yes.

11 MR. ANDES: And we actually have an
12 exhibit which is a CDC report that we cited, but
13 we have a press release from the CDC concerning --
14 I think I have the wrong exhibit at the moment.
15 We have the CDC report regarding this issue that
16 we want to enter into the record.

17 MS. TIPSORD: And is this the report
18 cited on page three of your pre-filed questions?

19 MR. ANDES: Yes. I think I've just
20 asked the initial question about it. The report
21 is entitled Surveillance for Waterborne Disease
22 and Outbreaks Associated with Drinking Water and
23 Water Not Intended for Drinking, United States
24 2005, 2006, from the CDC.

1 MS. TIPSORD: If there's no
2 objection, we will mark this as Exhibit 235.

3 MS. WILLIAMS: Hang on. Do the
4 dates match? I don't think the dates match what
5 was cited here, do they?

6 MS. TIPSORD: Right. The title and
7 the footnote don't match either.

8 MR. ANDES: That's true.

9 MS. TIPSORD: I just assumed it was
10 a typo in the pre-filed questions because the
11 title didn't match either. The title is longer in
12 the footnote.

13 MR. ANDES: We will clarify that.

14 MS. TIPSORD: Because the title also
15 talked about recreational water, United States
16 2003, 2004.

17 MS. ALEXANDER: This is a different
18 document than is cited.

19 MS. TIPSORD: Do you still want to
20 admit it?

21 MR. ANDES: No, we will introduce
22 the proper exhibit later.

23 MS. TIPSORD: Then we will not mark
24 this as an exhibit.

1 MR. ORRIS: We're not going to use
2 this?

3 MS. TIPSORD: No. Thanks, Deb.

4 MR. ANDES: In the greater Chicago
5 area, do you think more people who swim or -- are
6 at more risk in public and private swimming pools
7 rather than in the CAWS?

8 MR. ORRIS: I haven't done a study.

9 MR. ANDES: Would you imagine that a
10 lot more people use swimming pools in the Chicago
11 area than use the CAWS?

12 MR. ORRIS: You said the CAWS. I'm
13 sorry. I mis-answered because from my
14 understanding you're not allowed to swim in the
15 CAWS and from Dr. Dorevitch's excellent study and
16 previous work that he cites, they didn't see
17 anybody swimming in the CAWS.

18 MS. ALEXANDER: I want to object to
19 that. The question was framed not comparing
20 swimming specifically, but comparing use of the
21 CAWS to use of swimming pools and I would object
22 to that because I think it calls for speculation
23 and assumes facts not in evidence, but if you're
24 just talking about swimming, then I'll let --

1 MR. ANDES: I can rephrase the
2 question. Do you think more people swim in
3 swimming pools in the Chicago area than recreate
4 in the CAWS?

5 MR. ORRIS: I'm sorry. Apples and
6 oranges.

7 MR. ANDES: Just answer the
8 question.

9 MR. ORRIS: I can't answer the
10 question.

11 MR. ANDES: Really? You don't think
12 more people swim in swimming pools in this area
13 than recreate in the CAWS?

14 MS. ALEXANDER: I object. That
15 calls for speculation.

16 MR. ORRIS: From my understanding,
17 sir, I've been invited here today to share my
18 expertise and my speculation about how many
19 people, without a study, swim versus recreate in
20 kayaks or whatever is not within my body of
21 knowledge.

22 MR. ANDES: Very well. Are you
23 aware that employees, ill of gastroenteritis at a
24 California water park, continued working and

1 swimming in the pools resulting in a
2 cryptosporidium outbreak involving 336 persons in
3 2004?

4 MR. ORRIS: I believe I read that
5 report, yes.

6 MR. ANDES: Should all water parks
7 and swimming pools be closed to protect sensitive
8 populations that might use them?

9 MR. ORRIS: Again, you're asking me
10 for a public policy position here and certainly
11 preventive measures should be taken in all of
12 these settings. The exact preventive measures
13 ought to be evaluated based on all of the evidence
14 that we have previously discussed today and I
15 don't want to comment specifically on what most
16 appropriately should be done at a water park in
17 California.

18 MR. ANDES: Are you aware that the
19 CDC has identified that for treated water of any
20 use, no federal regulatory agency or national
21 guidelines for standards of operation,
22 disinfection or infiltration exist?

23 MR. ORRIS: I think that was written
24 in that earlier CDC report that I read.

1 MR. ANDES: Should the Illinois
2 Department of Health which has regulations
3 associated with bathing beaches start requiring
4 that all public swimming pools upgrade to
5 microfiltration and UV disinfection?

6 MR. ORRIS: Again, that's not an
7 issue that's come before me and I wouldn't want to
8 comment on it until I looked at the materials
9 since I do sit on the Illinois Board of Health.

10 MR. ANDES: As to the Milwaukee
11 cryptosporidium outbreak and it may be an issue
12 for Dr. Gorelick as well, are you aware that the
13 Wisconsin agencies have reported that the outbreak
14 was not associated with treated effluent from the
15 Milwaukee Sewerage District, but will result in a
16 number of factors that include heavy rains, frozen
17 ice covered ground, particularly where manure has
18 been spread, barnyard runoff, raw sewage
19 overflows, slaughter house effluent, removal of
20 the dam on the Milwaukee River and/or changes in
21 filtration practices at the drinking water plants?

22 MR. ORRIS: I would defer on the
23 specifics. That sounds like the list I read based
24 on that review, but I wouldn't swear to every one

1 of those things that you said, but let me defer to
2 you on that.

3 MR. GORELICK: Yeah. That
4 particular outbreak was felt to be multi-bacterial
5 including many of the factors that you read.

6 MR. ANDES: I believe I have an
7 exhibit. I'm just looking for it. We'll probably
8 come back to that issue later. Dr. Orris, while
9 you've talked in your testimony about the risks of
10 illness and contact with sewage contaminated
11 water, have you compared the difference in health
12 risks between treated secondary effluents, in
13 other words, effluent that has been biologically
14 treated as opposed to raw or partially treated
15 sewage?

16 MR. ORRIS: I believe the studies
17 that were done -- well, I'd have to go back and
18 look at that specifically. The studies that I
19 recall that were done for recreational use in
20 South Africa, Europe, Canada, et cetera -- and in
21 the States, talked about the contamination of the
22 water based on indicator bacteria and did not deal
23 with what prior treatment occurred. So they did
24 make mention of the fact that the water was still

1 contaminated. So the answer to the question is
2 simply put as, no, I don't recall the specifics.
3 It is the water itself that I believe was tested
4 in most of these studies.

5 MR. ANDES: Okay. On page four of
6 your testimony you discuss the, quote, high,
7 unquote, levels of fecal bacteria that the
8 District has measured in the CAWS, and you stated
9 that the high levels of indicator bacteria found
10 in the CAWS are very likely correlated with the
11 presence of waterborne pathogens that threaten
12 human health. Can you explain the basis for your
13 statement that those high levels of indicators are
14 very likely correlated with the presence of
15 waterborne pathogens?

16 MR. ORRIS: Yeah, that's one of the
17 issues that is really rather well known with this
18 and that is you can use these indicator bacteria's
19 as markers of the overall bacterial load for human
20 pathogens and that disease is correlated with
21 that. We've just been involved in reviewing some
22 research again on the Great Lakes issues of -- on
23 the same manner and while -- and it's pretty clear
24 that you don't have to get every bacteria and

1 measure every bacteria. You can use certain of
2 the indicator bacterias and that tells you the
3 correlate stories and the response story as well
4 as exposed, nonexposed, so yes.

5 And in most of those studies the
6 levels that they measure are in the hundreds,
7 sometimes low hundreds, but hundred, two hundred,
8 per hundred milliliters of water. In these areas
9 you had on your web pages, et cetera, are bacteria
10 in the thousands. So, you know, we're not --
11 we're a whole order of magnitude above some of
12 these things that were considered to be
13 contaminated in these other studies.

14 MR. ANDES: In prior testimony --
15 have you read the testimony provided by
16 Dr. Blatchley in this proceeding?

17 MR. ORRIS: I scanned it.

18 MR. ANDES: All right. Are you
19 aware, if I characterize what he said, he talked
20 about whether conventional disinfection would in
21 fact, be effective in removing various pathogens
22 both in terms of bacteria and viruses and
23 suggested that, in fact, these disinfection
24 methods, they would meet the Agency's proposed

1 standard -- would, in fact, not be effective in
2 removing those pathogens?

3 MS. ALEXANDER: I'm going to object
4 to the characterization of the testimony. I
5 believe that that was precisely the issue.

6 MR. ANDES: I can rephrase.

7 MS. ALEXANDER: Okay.

8 MR. ANDES: Do you believe that
9 conventional disinfection methods would, in fact,
10 effectively remove any risk presented by bacteria
11 and viruses?

12 MR. ORRIS: Of course, this is some
13 degree out of my area. This is microbiology and
14 sanitation, but I know because of the reviews that
15 we're doing and the overall look at this that
16 there have been real advances made in
17 disinfection. So when you say conventional
18 methodology, we don't use some significant lack of
19 effectiveness of chlorine, for instance, that, for
20 instance, with cryptosporosis and others that is
21 now overcome by the use of UV and other
22 methodologies. So depending on your terminology,
23 conventional, I would certainly agree that, one,
24 none of these disinfection methods removes all of

1 the bacteria or inactivates all the bacteria and
2 some are better than others.

3 MS. TIPSORD: And, for the record, I
4 would note that Dr. Blatchley's testimony was
5 Exhibit 93.

6 MR. GORELICK: If I could add
7 because this question, again, came up in pre-filed
8 questions to me. I've also looked at Dr.
9 Blatchley's testimony as well as his article and
10 my understanding is that disinfection does not, in
11 fact, remove all pathogens, however the
12 disinfection method studies shows that when you
13 disinfect levels of indicator bacteria do drop.
14 That in some cases they come back, that some
15 methods are more beneficial than others, but I
16 don't think the conclusion was that disinfection
17 is useless.

18 MR. ANDES: I don't think anyone
19 suggested that. As to the -- and to some extent
20 we may have addressed this, Dr. Orris, when you
21 reviewed to the CHEER study as an excellent study,
22 you're aware, are you not, that the research plan
23 was evaluated by a panel of recognized leaders in
24 the field and they determined the study, quote,

1 has been designed to provide information that is
2 valuable in the area of health risks associated
3 with secondary contact recreation and addressed
4 potential deficits in the current knowledge and
5 health risks associated with limited contact water
6 recreation and the measures acquired to protect
7 the public?

8 MR. ORRIS: Yes, I absolutely agree
9 with that.

10 MR. ANDES: Okay. Thank you.

11 MS. TIPSORD: Excuse me, Mr. Harley
12 has a question.

13 MR. HARLEY: Hi. My name is Keith
14 Harley. I'm an attorney for the Southeast
15 Environmental Task Force. There was a pre-filed
16 question I believe you skipped over that I believe
17 might be helpful in terms of creating the record.
18 The pre-filed question was seven and it was
19 subpart A. It was: What do you consider to be
20 high levels of indicator bacteria? You eluded to
21 the effect in an answer to another question that
22 you believe the levels of indicator bacteria found
23 in the CAWS were high. Could you please explain
24 for the Board on what basis you came to that

1 conclusion?

2 MR. ORRIS: I'm sorry. I thought
3 that's what I was referring to in some of these
4 prior studies and the levels were in the hundreds
5 and I'm not speaking absolute levels, but
6 qualitatively looking at these indicator bacteria,
7 I think 200 is often used as the marker, but,
8 again, these were levels that were considered
9 contaminated at those levels and what I, and is
10 attached to my testimony, have here is the
11 documentation to have of the levels in the CAWS
12 that are in the thousands. So it's an order of
13 magnitude above these other ones.

14 MR. HARLEY: So that is high. You
15 consider the levels to be high?

16 MR. ORRIS: Yes.

17 MR. HARLEY: Thank you.

18 MR. GORELICK: I would just like to
19 add that there are studies that have shown
20 increased risk of disease from -- again, this is
21 swimming so I know it's not the kind here, but
22 risk of exposure in recreational water from counts
23 ranging from only a few indicator per hundred ML
24 to about 30 indicator per hundred ML. So

1 relatively low levels still associated with
2 increased risk of illness in those exposed to the
3 recreational waters.

4 MR. HARLEY: When you say a range of
5 1 to 30 --

6 MR. GORELICK: This was a review of
7 22 different studies.

8 MR. HARLEY: When you say 1 to 30,
9 is 1 to 30, by range of comparison, to the
10 thousands which are found in some locations in the
11 CAWS, is that correct?

12 MR. GORELICK: Right.

13 MR. HARLEY: Thank you.

14 MR. ANDES: Again, those were all
15 swimming studies, right, so in terms of
16 epidemiologic study of secondary contacts of the
17 types of recreation we talked about in the CAWS
18 this really is your study, first study, that
19 really looks at that issue, correct?

20 MR. GORELICK: I don't think it's
21 the first study. There have been studies of
22 canoeing and kayaking that have been performed.
23 It is the first study that is being done on the
24 CAWS and it's the first one that I know of that is

1 actually looking at both water quality indicators
2 and pathogens from the people who are exposed at
3 least in some way.

4 MR. ANDES: Thank you. And when we
5 talk about levels of --

6 MR. ORRIS: Can I --

7 MR. ANDES: When we talk about
8 levels of indicator bacteria in the CAWS, I assume
9 you're not distinguishing among sources in terms
10 of whether those could be due to the fact of
11 combined sewer overflows, which we know do lead to
12 high levels at some points. You're speaking
13 generally about the level of the water quality in
14 the CAWS from whatever source?

15 MR. GORELICK: Yes. The question
16 was are they high and the conclusion that they are
17 high is because those levels have been associated
18 with disease.

19 MR. ANDES: Okay. In terms of the
20 issues concerning enrolling people in high risk
21 groups, the statement, Dr. Orris, was that the
22 understudy would not enroll -- won't enroll enough
23 people in high risk groups. You're aware that
24 survey research generally samples less than a

1 hundredth of one percent of the population?

2 MR. ORRIS: That's what I understand
3 also from CNN on election night.

4 MR. ANDES: And if this study, in
5 fact, enrolls 5 or 10 percent of CAWS users or
6 maybe more, isn't that actually a fairly high
7 percentage of the population surveyed?

8 MR. ORRIS: Again, we review the
9 difficulties in these studies and understanding
10 when you have a negative study, whether it's due
11 to a lack of a relationship or that you miss the
12 relationship and I would only be repeating that
13 again. We have more elegant ways of assessing it
14 and this study used more elegant ways to priority
15 assess whether or not they would identify it.

16 MR. ANDES: So what that says is,
17 correct me if I'm wrong, A, we'll need to see what
18 the study says and that will help us determine how
19 much weight to give it and that it can then be
20 assessed with other factors in making a regulatory
21 decision?

22 MR. ORRIS: Certainly. It should be
23 considered with other factors in making a
24 regulatory decision and it should not be relied on

1 on its own. And I guess the other response is
2 maybe we should recount Ohio again from two
3 elections ago.

4 MR. ANDES: We won't go there.

5 MR. ORRIS: Okay.

6 MR. GORELICK: This question was
7 also posed to me in the pre-filed questions and
8 this one one hundredth of a percent versus 5 to 10
9 percent is actually a little bit irrelevant. It's
10 actually the number that gives you the degree of
11 precision. So the margin or error in a poll or in
12 a study is based on the size of the sample, not
13 the proportion of the population that's being
14 sampled. So one hundred subjects gives you a
15 margin of error that is the same regardless if
16 that one hundred is ten percent of your population
17 or one one thousandth of a percent of your
18 population. It's the sample size that determines
19 margin of error.

20 MR. ANDES: Let me ask the question.
21 If the sample population is one hundred people and
22 you survey all hundred people --

23 MR. GORELICK: Then you're no longer
24 doing a survey. When you start to approach the

1 majority of the sample, then the margin of error
2 becomes irrelevant.

3 MR. ANDES: Where's the dividing
4 line if we're saying on five to ten percent is a
5 lot better than a hundred percent?

6 MR. GORELICK: If you're much less
7 than 50 percent, it's somewhat irrelevant. And to
8 give an example, if I wanted to know the average
9 age of the people on this panel, and there are
10 eight, and I asked two of them, that's 25 percent,
11 but I would have a very high margin of error by
12 asking only two people. If I ask all eight, then
13 I'll know the answer for all eight.

14 So it's a question of sampling
15 from a population and who you're hoping to
16 extrapolate from. The other thing is even if you
17 sample a high percentage of a study population,
18 one hopes that one will extrapolate those results,
19 not just for the people who are in the study, but
20 all future users of the CAWS. So even if you have
21 five to ten percent of the people who are using
22 the CAWS during the time of your study that is
23 still a smaller fraction of the people to whom
24 those results will be extrapolated, which is all

1 people you think will be using the CAWS during the
2 time this will be in effect. But my point is
3 valid. Five to ten percent is really no
4 different.

5 The sample size is what matters
6 and the sample size of this study is relatively
7 quite large, 9,000. The concern, again, is that
8 of those 9,000 if I were interested in a subgroup
9 of them, for example, children or, for example,
10 people engaging in one particular activity, now my
11 sample size isn't 9,000. It's the number who
12 engaged in that activity. It's the number that
13 fall into that risk group.

14 So the effective sample size to
15 answer the question in that subgroup which may be
16 an important subgroup because different
17 activities, different age groups may differ, et
18 cetera. I will have even less power than the 80
19 percent to answer that question in the subgroup
20 even if it's a relatively high percentage of that
21 population.

22 MR. ANDES: So what that then says
23 is, am I right, it would be possible you would get
24 the results back and you may have enough people in

1 a given subgroup that you want to focus on that
2 you can reach some conclusions that you were
3 comfortable with or you may decide you need to
4 look at that group more intensely.

5 MR. GORELICK: Right. And the power
6 of this study depends in part on the number of
7 people. It depends in part on how strong an
8 association you wish to find. The smaller the
9 association, the more people, subjects you need to
10 answer the question.

11 So if I think that, for example,
12 children are at ten times higher risk, actually I
13 don't need all that many children, but if I think
14 they're only at twice the risk, I'll need more
15 children. So a positive finding in a subgroup
16 might actually be very important because if you
17 find a positive association despite the small
18 sample size, that means it's a fairly high, strong
19 association. On the other, a negative finding in
20 a subgroup is of less value because the chance of
21 it being a false negative, the type two error that
22 we talked about to be technical, is that much
23 higher given the smaller sample size in that
24 subgroup.

1 MR. ANDES: Okay. Dr. Orris, on
2 page six of your testimony, there are statements
3 made regarding putting users of the CAWS at risk
4 of infection if disinfection does not occur.
5 First of all, since, as we have talked about
6 before, whether disinfection is practiced or not,
7 there are still bacterial loads from other sources
8 so I assume you think that even if disinfection
9 were to happen those users would still be at risk
10 of infection, am I right?

11 MR. ORRIS: Of course, but then
12 again you're using the terminology, this global
13 terminology of at risk.

14 MR. ANDES: That was your term.

15 MR. ORRIS: The question is how --
16 that's the correct use of the terminology when you
17 talk about would people still be at risk. Again
18 we've had this discussion about how we're trying
19 to reduce risk in this situation, not eliminate
20 it. There's no such thing as eliminating it.

21 MR. ANDES: But when you say that
22 every year when disinfection does occur puts users
23 of the CAWS at risk of infection, all I'm saying
24 is they're at risk of infection under your view of

1 bacterial loadings anyways, right? It's not that
2 they're not going to be at risk and you're
3 positive here that if there's disinfection and
4 they're not at risk, that's the implication and
5 they're put at risk by no disinfection, all I'm
6 saying is that's not really accurate.

7 MR. ORRIS: Again, I was told in
8 college that the contrapositive is not necessarily
9 true logically and that's what you're implying. I
10 said a correct statement which is in the positive.
11 That when you don't disinfect, there is a risk
12 from that waterway that people are using and
13 you're saying to me that if you do disinfect,
14 there is no risk. That is not the logical
15 conclusion based on my statement, but, again, what
16 I'm just trying to communicate is you will reduce
17 the risk through disinfection of the waterway.

18 MR. ANDES: Thank you. Do you
19 have -- other than based on the high levels of
20 indicator bacteria, are you aware of any
21 information regarding what the current health risk
22 is to people recreating in the CAWS?

23 MR. ORRIS: No. Burden of disease
24 as we're discovering with respect to all these is

1 quite problematical. That's why we think that all
2 of these studies are useful and the more specific
3 we can get with them, the better.

4 MR. ANDES: Have you reviewed the
5 risk assessment conducted by Geosyntec that has
6 been put into the record in this proceeding?

7 MR. ORRIS: Sometime ago. I don't
8 recall it now.

9 MR. ANDES: Are you aware that if
10 the District's plan were required to disinfect, it
11 would take some years before those plants would
12 actually be disinfecting?

13 MR. ORRIS: I understand it would
14 take some time, yes.

15 MR. ANDES: But it sounds like
16 you're not recommending that people stop
17 recreating in the CAWS in the meantime?

18 MR. ORRIS: I am not -- I have no
19 recommendation on that per se. I would have to
20 look at that question specifically. I do not --
21 from what I have looked at already, that would not
22 be the approach I would take.

23 MR. ANDES: But if you think there's
24 a significant risk now, why wouldn't you tell

1 people don't go in the water?

2 MR. ORRIS: I would certainly try to
3 improve on this risk communication that's
4 currently being done and look for mechanisms
5 outside of the education of the individual with
6 the signs that we've had a discussion about prior.
7 The solution while simple, is not always correct
8 that you eliminate all exposures based on a whole
9 lot of other things. Now, those whole lot of
10 other things in this setting is a burden that is
11 on the Board and the District with respect to this
12 issue.

13 MR. ANDES: I assume that in the
14 balance we've discussed -- concerning various
15 risks, one would also want to consider whether
16 there are risks from disinfection bi-products.
17 That would be a factor to take into account in
18 determining what course of action the Board ought
19 to take?

20 MR. ORRIS: Yes.

21 MR. ANDES: Let me move onto
22 questions for Dr. Gorelick, although I assume some
23 of them will be answered by either one of you.

24 MS. TIPSORD: Before we do that,

1 let's take a short break.

2 MR. HARLEY: And I have one follow
3 up for -- when the time comes.

4 MS. TIPSORD: Go ahead. We'll do it
5 before the break.

6 MR. HARLEY: I want to -- again, my
7 name is Keith Harley from the Southeast
8 Environmental Task Force. I wanted to go back to
9 question 14 again because in your quote you say
10 every year in which disinfection does not occur
11 puts users of the CAWS at risk of infection.
12 Would you be able to comment on the ways in which
13 nonusers of the CAWS may also be at risk by virtue
14 of the transmission of illness, for example,
15 gastrointestinal illness?

16 MR. ORRIS: That's an interesting
17 point. Obviously, these are uncommunicable
18 diseases. I had not looked at that issue
19 specifically to this point, but certainly these
20 are communicable diseases.

21 MR. HARLEY: So it's possible that a
22 user of the CAWS could communicate disease to
23 nonusers during the same period of time that
24 you're talking about when you say every year in

1 which disinfection does not occur put users of the
2 CAWS at risk of infection?

3 MR. ORRIS: Certainly, most of the
4 diseases we're talking about here are only
5 transmitted through close contact, et cetera, so
6 there would be some limitation, but there would be
7 residual risk.

8 MR. HARLEY: Thank you.

9 MR. GORELICK: And I should indicate
10 one of the points I made in my testimony was
11 exactly that, which is that the CHEER study, among
12 others, by looking only at people who have
13 actually used the river or the waterway in
14 question may, in fact, underestimate the amount of
15 illness because people who become infected, even
16 those without symptomatic infections which many of
17 these pathogens cause, can then spread that to
18 household contacts and most of the studies have
19 not asked about illness in people in the home and
20 we know that presence of ill contact in the home
21 is one of the biggest risk factors for, at least,
22 gastrointestinal illness.

23 MR. ANDES: Can I follow up on that?
24 Are you aware that the Geosyntec risk assessment

1 did look at that possibility of transmission?

2 MR. GORELICK: It wasn't a study
3 that looked at whether it happens. They were
4 modeling that.

5 MR. ANDES: Okay.

6 MR. HARLEY: When you say homes,
7 would that also include other settings in which
8 there is direct contact, for example, a child care
9 center?

10 MR. GORELICK: Yes.

11 MR. HARLEY: Or a school?

12 MR. GORELICK: A place where there
13 is close contact that would allow and the type of
14 contact depends on the disease organisms, but it's
15 usually by close direct contact.

16 MR. HARLEY: Could it occur in a
17 health club?

18 MR. GORELICK: The one I'm most
19 familiar with is risk in the home and daycare
20 setting.

21 MR. ORRIS: Could I add one --
22 amplify my last answer a little bit because of the
23 areas --

24 MR. ANDES: Yes.

1 MR. ORRIS: I'm sorry. I need a
2 break also. There was something in which I
3 thought we were going to get into with the CDC
4 study -- or the CDC report and MNWR, but there is
5 a useful critique both in that one and the other
6 one, et cetera, about our problems with
7 surveillance and this is the same issue where
8 we're coming up against with IJC, the
9 International Joint Commission and that is we
10 really do not have good methodologies to track
11 these illnesses.

12 So that when we say there's no
13 outbreak that occurred, it is not comforting. It
14 is rather a comment on our lack of ability to
15 effectively track illnesses related to these kinds
16 of waterways and other ubiquitous sources, if you
17 will. It is almost amazing that we do see
18 something reported through the systems that we
19 have.

20 So as a correlate of the
21 question of trying to improve the educational
22 component and the preventive methods as you are
23 moving ahead with gearing up the disinfection,
24 which I hope you will do. We ought to also be

1 looking at and perhaps also considering
2 recommendations to the District about how should
3 we try to, on a regular basis, monitor these kinds
4 of diseases and it's not easy, but it needs some
5 more thinking and discussion.

6 It's the kind of thing that
7 we're going to be doing around the Great Lakes as
8 a whole between the US and Canada and I'm not sure
9 we'll go over this specifically. Thank you.

10 MS. TIPSORD: With that, let's take
11 a ten-minute break.

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

15 MS. TIPSORD: Okay. Is everybody
16 ready? Let's go back on the record. Mr. Andes.

17 MR. ANDES: Thank you. Dr.
18 Gorelick, if I can go to the questions that we
19 raised for you. On page one of your testimony,
20 you talk about the study and whether its basis for
21 allowing a heavy pathogen load in recreational
22 waters -- I guess I'm questioning what's the basis
23 for that statement regarding heavy pathogen loads
24 when the measured concentrations of actual

1 pathogens, not indicator bacteria, but actual
2 pathogens in the risk assessment document were
3 actually very low?

4 MS. ALEXANDER: I'm going to object
5 to the characterization of risk assessment. With
6 that said, you can answer.

7 MR. GORELICK: I think there's a few
8 things. First is, there's a large body of
9 evidence showing that high indicator levels are
10 correlated with high risk of disease. There are
11 studies showing that indicator levels are
12 correlated with the presence of pathogens. There
13 are studies showing that you can have high levels
14 of pathogens even in absence of high levels of
15 indicators for a variety of reasons.

16 So there's a fairly established,
17 I think, consensus that indicator loads are
18 indicative of fecal contamination which correlates
19 with health risk and correlates with presence of
20 pathogens.

21 I am not intimately familiar
22 with the risk assessment, but I have looked at it
23 and I would comment a few things. One is, they
24 only looked at a small number of pathogens. There

1 are many, many viruses, protozoa and bacterial
2 pathogens that are implicated in human illness and
3 there were several of them that were looked at,
4 but by no means the majority.

5 So it was relatively a small
6 number of pathogens looked at. The second thing
7 is that the pathogens were looked at, as I recall,
8 using a cell cultured technique. And there are a
9 variety of ways of identifying particularly viral
10 pathogens and I'm not a microbiologist, but my
11 general understanding as a physician is that cell
12 cultured techniques are less sensitive, that some
13 of these viruses are harder to grow in culture
14 than they are to detect, for example, using PCR or
15 DNA based methods.

16 So it may be that there is
17 actually some underestimation based on the use of
18 that, but, again, that is somewhat outside my area
19 of expertise. Just my comment would be that
20 single risk assessment, finding low levels of
21 pathogens, when I take that into account with the
22 full body of literature knowing what I know about
23 the level of indicator bacteria in the waterway,
24 that's the basis for my conclusions.

1 MR. ANDES: Let me ask you then.

2 Are you aware, in fact, the folks who conducted
3 that assessment, did use a PCR method?

4 MR. GORELICK: They used it as well
5 as the culture method?

6 MR. ANDES: Yes.

7 MR. GORELICK: Okay.

8 MR. ANDES: Also, my recollection
9 and you said that you weren't intimately familiar
10 with the risk assessment, but if those pathogens
11 that we looked at which were most commonly
12 occurring then, in fact, would be fairly
13 representative of the risk since it's not really
14 possible to look at all the pathogens if you look
15 at the ones that are most common, that would
16 probably give you some sense of the issues that
17 would occur, correct?

18 MR. GORELICK: I think there's a few
19 things. First is, I'm not sure we know what
20 occurs most commonly because we haven't been
21 looking for pathogens very often. Most of the
22 water quality studies looked at indicators. I
23 would raise neuroviruses as an example of
24 something that was relatively unheard of 20 years

1 ago. It turned out to be a very common pathogen.
2 So these new pathogens as we get better techniques
3 are being identified all the time. So I don't
4 know that I would say they're most common.

5 MR. ANDES: Are you aware that the
6 neuroviruses were looked at in that study?

7 MR. GORELICK: Yes, that's an
8 example of one that is common, but I used it as an
9 example of one that 20 years ago we would not have
10 said was a common one and one we would not have
11 looked for.

12 MR. ANDES: And as to testimony in
13 this matter by Dr. Blatchley and others, to the
14 effect that there is not such a good correlation
15 between indicator bacteria and pathogens, you
16 would disagree with their statements?

17 MR. GORELICK: I'm sorry. Can you
18 say that again?

19 MR. ANDES: There was testimony by
20 other parties by other witnesses concerning that
21 correlation which reached a result somewhat
22 different than yours. So I'm just wondering if
23 you examined that testimony and have any
24 assessment of that.

1 MS. ALEXANDER: I'm going to object
2 to the characterization of that, but I'll let the
3 witness answer because I believe he's reviewed
4 Dr. Blatchley's study.

5 MR. GORELICK: I've reviewed
6 Dr. Blatchley's study, but I haven't reviewed in
7 detail the testimony that he gave here and I'm not
8 sure that the conclusion from this study is that
9 levels of indicators don't correlate with levels
10 of pathogens.

11 MR. ANDES: Are you aware in the
12 risk assessment that was conducted of there being
13 instances where one found fairly high levels, as
14 Dr. Orris identified, of indicator bacteria, yet
15 the pathogen levels were low?

16 MR. GORELICK: Again, given the
17 small number of pathogens that were looked at and
18 other issues of risk assessment that may be what
19 they said, but the consensus over the years,
20 including the US EPA's consensus is that indicator
21 bacteria are indicative, that's why we call them
22 that, of health risk and presence of pathogens.

23 MR. ANDES: There's a paper you
24 coauthored and reference in your testimony

1 entitled Pediatric Emergency Department Visits for
2 Diarrheal Illness Decreased after Release of
3 Undertreated Sewage in which you made a statement
4 in which I'll summarize which refers to situations
5 where the usual secondary treatment with
6 biological agents do not occur and you
7 specifically refer to, quote, the usual secondary
8 treatment with biological agents where most
9 pathogens are removed, unquote.

10 So that seems to be the
11 statement that, and correct me if I'm wrong, that,
12 in fact, secondary treatment processes, biological
13 treatment processes do, in fact, achieve a high
14 level of remove of pathogens?

15 MR. GORELICK: Yeah, there are
16 sequential stages in sewerage treatment. The
17 primary treatment removes some pathogens,
18 secondary treatment removes more pathogen.
19 Pathogens remain, disinfection then further
20 removes the pathogens.

21 MR. ANDES: Okay. In your testimony
22 on page eight, you mentioned plagues that have
23 been caused by untreated sewage and this really
24 goes to the same question I asked Dr. Orris in

1 terms of distinguishing between -- and I
2 understand you are distinguishing between raw
3 sewage being discharged in waterways versus
4 discharges that have been subject to secondary
5 biological treatment and those are two different
6 things?

7 MR. GORELICK: Those are two
8 different things.

9 MR. ANDES: Okay. Are you familiar
10 with the report entitled Public Health Risks
11 Associated with Waste Water Blending by Katonak
12 and Rose.

13 MR. GORELICK: I have not seen that
14 report. I have only seen Dr. Roses testimony at a
15 conference about that report.

16 MR. ANDES: And we will introduce
17 that as an exhibit and I wish I had it here.
18 There we go. But the name of the report is Public
19 Health Risks Associated with Waste Water Blending,
20 November 17th, 2003.

21 MS. ALEXANDER: And I just want to
22 point out for the record I'm not going to object
23 to the introduction of this document, but we did,
24 in fact, ask for this by letter. We did not

1 receive it. Therefore, the witnesses have not had
2 an opportunity to review it.

3 MS. TIPSORD: If there's no
4 objection, we'll admit the Public Health Risks
5 Associated with Waste Water Blending, Rachel
6 Katonak and JB Rose final report, November 17th,
7 2003, as Exhibit 235. Seeing no objection, it's
8 Exhibit 235.

9 MR. ANDES: Do you agree with the
10 reports finding which we're characterizing here
11 although I can cite to a page. The report
12 discusses -- and I can refer to a page on this.
13 The discussion of secondary treatment on pages 22,
14 23, and 24 refers to a reduction of various
15 bacteria protozoa, metazoa, by cryptosporidium,
16 giardia, by 9 -- 99.9 percent and 2 percent and
17 other high percentages -- do you have any reason
18 to doubt that information?

19 MS. ALEXANDER: I would like to give
20 the witnesses an opportunity to review this. I
21 objected to the question before they had an
22 opportunity to read the document. So can you
23 please clarify specifically what you're asking
24 them to agree with? It's the section, secondary

1 treatment, that begins on page 22 and where do you
2 want them to read to?

3 MR. ANDES: Page 24. There are
4 statements made concerning the levels of reduction
5 of pathogens by secondary treatment.

6 MS. ALEXANDER: Okay. Why don't you
7 go ahead and read this and let us know when you're
8 ready.

9 MR. GORELICK: This report shows
10 data suggesting that secondary treatment results
11 in a reduction in pathogens. Dr. Roses testimony
12 to Congress said that secondary removes anywhere
13 from 80 to 99.9 percent. I would also point out
14 that she then goes on to say -- I want to talk
15 briefly about disinfection. We know that
16 disinfection is an important process for control
17 with these microbes. So I think the message here
18 is that secondary treatment is important and, in
19 fact, I know that the issue of waste water
20 blending revolves around skipping secondary
21 treatment and whether that's a safe practice.

22 MR. ANDES: In fact, you're not
23 aware --

24 MR. GORELICK: I would say that

1 while secondary treatment leads to a further
2 reduction in pathogens from sewage so primary
3 treatment is an improvement over raw sewage.
4 Secondary treatment is an improvement over primary
5 treatment and the bulk of the evidence would
6 suggest that disinfection is an improvement of
7 secondary treatment. So I would agree that it
8 looks like much of it comes out from secondary
9 treatment, but not all of it.

10 MS. ALEXANDER: And I would just
11 like to clarify for the record that we have
12 Dr. Roses testimony from Congress, but
13 unfortunately I didn't make enough copies. I can
14 offer it as an exhibit now or we can make copies
15 and offer it later, but I wanted to make it
16 available in light of Dr. Gorelick's testimony.

17 MS. TIPSORD: Let's admit it as an
18 exhibit and then we can get copies at lunch.

19 MS. ALEXANDER: This is a copy of a
20 day in testimony. It concludes on page 17, which
21 contains the record statement which I will offer
22 as an exhibit.

23 MR. ORRIS: If I might just
24 intervene for a moment on this being attracted

1 to --

2 MS. TIPSORD: Let me finish with the
3 business.

4 MR. ORRIS: I'm sorry.

5 MS. TIPSORD: Let me mark this as an
6 exhibit first. We will mark this as Exhibit 236
7 and then we'll get copies for every one at lunch.
8 It's Exhibit 236. Go ahead.

9 MR. ORRIS: I'm sorry. I had seen
10 this as part of another review, but I'm only --
11 and I recall, and as attracted as I am to this
12 last sentence of most of these studies, I would
13 only call to your attention that the last sentence
14 of this study under conclusion or the last two
15 sentences does emphasize what you've just raised
16 and that is greater than 99 percent of the loading
17 pathogenic viruses and parasites come from the
18 untreated portion of the flow, but then the final
19 sentence which is quite interesting with respect
20 to this and the questions here before us. The
21 risk associated with swimming -- again, this is
22 not swimming per se. The risk associated with
23 swimming in waters receiving such flows are a
24 hundred times greater than waste water than if the

1 water waste had been completely treated. So your
2 secondary treatment as you say does quite well,
3 but it still is a hundred times poorer than the
4 existing --

5 MR. ANDES: With regard to swimming
6 risks.

7 MR. ORRIS: With regard to swimming,
8 yes.

9 MR. ANDES: Okay. With regard to
10 the Milwaukee cryptosporidium outbreak, as I
11 understand it, that was a drinking water related
12 outbreak, not a recreational water outbreak, am I
13 right?

14 MR. GORELICK: That is my
15 understanding as well, yes.

16 MR. ANDES: And that incident
17 occurred when?

18 MR. GORELICK: 1993.

19 MR. ANDES: We referred earlier to a
20 report from the Wisconsin State Agencies
21 concerning the causes of that outbreak and I have
22 copies of that for the record. The title is
23 Cryptosporidium SPP. Oocyst and Giardia SPP.
24 Occurrence, Concentrations and Distributions in

1 Wisconsin Waters, 1995.

2 MS. ALEXANDER: I'm going to point
3 out once again for the record, we will not object
4 to the introduction of this, but the witness had
5 not reviewed it, notwithstanding the fact that we
6 specifically requested it by letter.

7 MS. WILLIAMS: Can I just ask a
8 clarification for --

9 MS. TIPSORD: Debbie, don't use --
10 just speak up. We can't understand you through
11 the mic.

12 MS. WILLIAMS: So you're telling us
13 that you asked the District by letter for the
14 documents that were cited in the pre-filed
15 questions and they did not provide them?

16 MS. ALEXANDER: That is exactly
17 correct. I have the letter with me that I wrote
18 to the District. I did not receive a response to
19 the letter nor did I receive a copy of these
20 documents.

21 MR. ANDES: Dr. Gorelick, are you
22 familiar with the report?

23 MR. GORELICK: Not with the report
24 per se, but as you can imagine, Milwaukee comes up

1 in conversation from time to time so I'm aware of
2 the gist of the findings.

3 MS. TIPSORD: Excuse me. Before we
4 go on, I'm going to mark this as Exhibit 237. If
5 there's no objection, seeing none, it's Exhibit
6 237.

7 (Document marked as Group
8 Exhibit No. 237 for
9 identification.)

10 MR. ANDES: And I will say we regret
11 the oversight of not providing that information
12 before now. As I talked about before, it appears
13 that the statements in this report indicate that
14 the outbreak was not associated with treated
15 effluents. Do you disagree with that conclusion?

16 MR. GORELICK: No, I mentioned
17 cryptosporidium simply as an example of a
18 waterborne pathogen not because I thought the
19 Milwaukee outbreak had any direct relevance to
20 this particular question.

21 MR. ANDES: Okay.

22 MR. ORRIS: I'm sorry. You had
23 asked me the same question and it appears to be
24 contradictory to some of these things now upon

1 reviewing this. Having been around and concerned
2 with these issues at the time, I should only tell
3 the Board that what was startling about the
4 cryptosporidium outbreak in Milwaukee and what
5 really riveted our attention was it was only
6 picked up because there were the volume of
7 patients in the emergency rooms and the number of
8 people that were sick not going to work suddenly
9 alerted the public health authorities, again,
10 underlying our need for these conditions that it
11 cited as probably contributing were not a one time
12 occurrence. They occurred, but to a lesser degree
13 with some regulatory and we never picked up that
14 illness going on. So there's a lot of these
15 things. But I must say that your statement that
16 this doesn't relate to drinking water at all is
17 not reflected well within the text and that is it
18 says the other things that could be involved here
19 is at or changes in filtration processes and
20 drinking water plants. So some question about the
21 drinking water contribution as well is part of it.

22 MR. ANDES: I don't believe I said
23 that it wasn't related to drinking water, but
24 actually I will introduce one other related

1 document in that regard, which is a memorandum
2 from the city of Milwaukee Health Department,
3 April 28th, 2006, which states "There currently is
4 no evidence of drinking water quality degradation
5 at MWW treatment plants as a result of secondary
6 sewage bypasses at the waste water treatment
7 plant.

8 MS. TIPSORD: We will mark this
9 memorandum dated April 28th, 2006, as Exhibit 238.
10 If there's no objection, seeing none it's Exhibit
11 238.

12 (Document marked as Group
13 Exhibit No. 238 for
14 identification.)

15 MR. ANDES: In fact, as you said,
16 we're not really talking here on the CAWS about
17 secondary sewage bypasses anyway?

18 MR. GORELICK: Correct.

19 MR. ANDES: Dr. Gorelick, these are
20 questions that Dr. Orris addressed and I'm not
21 sure if you answered them as well, but when you
22 refer to the proposed effluent limits the question
23 that I have is do you believe that with the
24 proposed effluent limits, the waterways would be

1 safe for the general public? Would it make it
2 safe for the general public?

3 MR. GORELICK: It would make it
4 safer for the general public.

5 MR. ANDES: Given the bacterial
6 loads from CSO's and storm water runoff that would
7 be present anyways for the next 15 to 20 years,
8 would you think that there is a significant risk
9 of illness from those loadings?

10 MR. GORELICK: I don't have data to
11 know what the risk would be based on sewer
12 overflows, et cetera. The issue at hand, I think,
13 is every activity carries a risk. Recreating on
14 the CAWS carries a risk. Can that risk be lower
15 to public health measures and would it be worth
16 doing that, I would suggest that whether it's
17 worth doing that is a regulatory decision that
18 needs to incorporate a lot of other information.
19 Will it make it safer? I think the answer to that
20 is, yes, it would. And, you know, every activity
21 we do in our lives we assess what those risks are
22 and we take reasonable steps to make those risks
23 lower.

24 I took the train here this

1 morning. I took a little bit of a risk. I took
2 probably less of a risk than if I had driven and
3 if I had driven, I took less of a risk if I used
4 my seatbelt than if I don't. So I wouldn't say
5 that driving or taking the train is a safe
6 activity, but it has been made safer by public
7 health intervention.

8 I believe that when you talk
9 about whether it would make it safe, I think the
10 answer to that would be no. Nothing we do is
11 perfectly safe, but I would argue that the body of
12 evidence would suggest that it would make it
13 safer.

14 MR. ANDES: You haven't looked at
15 the levels of loadings between the discharges from
16 the treatment plants versus the various wet
17 weather sources, am I right?

18 MR. GORELICK: That's correct.

19 MR. ANDES: So you really don't have
20 an opinion as to the extent of risk reduction
21 relative to the remaining sources?

22 MR. GORELICK: Right. I think part
23 of this ties in with the point Peter made earlier
24 about outbreaks versus indemnity illness. So, you

1 know, combined sewer overflows occur during
2 specified periods of time. There's a time limited
3 effect as opposed to an ongoing level of risk
4 associated with ongoing treatment -- release of
5 treated water at treatment plants.

6 It ties in and this comes up a
7 few times in the question so I might as well
8 address it now, but the question of outbreaks
9 versus endemic risk. I think by focusing on
10 outbreaks, this is clearly just the tip of the
11 iceberg and arguing from presence or absence of
12 outbreaks doesn't really answer the question about
13 whether something is safe.

14 So -- and I think another
15 overall point to make and I have to concede that
16 there is real paucity of information about what
17 risks are from secondary contact recreation.
18 There are a few studies of kayaking, canoeing,
19 surfboarding, all of which have shown increased
20 risk, but those are relatively small studies. I
21 think the magnitude is unclear, although the
22 weight of the evidence would suggest that there
23 are risks associated with it.

24 But clearly we have more

1 information about the swimming and clearly we have
2 much more information about drinking water. But
3 the point about disease surveillance is the same
4 regardless of whether it's secondary, recreation
5 or swimming or drinking water, which is that
6 disease outbreaks identify a tiny percentage of
7 the diseases and I'll refer to what you were going
8 to introduce earlier, The Surveillance for
9 Waterborne Diseases and Outbreaks Associated with
10 Drinking Water.

11 This was a review of studies
12 over 20 years of outbreaks and it said during
13 that -- I'm sorry. Not 20 years, two years, but
14 there were 20 drinking water associated outbreaks
15 causing illness among an estimated 612 people. So
16 612 reported cases they identified. On page ten
17 of this document, they reference a US EPA study
18 with a symposium that they did with several
19 studies that tried to estimate what is nationally
20 the amount of illness annually from drinking
21 water. Endemic drinking water, not outbreaks.
22 And the estimates ranged from 4.3 million to 16
23 million. So the outbreaks that have been
24 identified are just the tip of the iceberg and I

1 think the same is true when you're looking at
2 recreational exposure.

3 Try to identify outbreaks of
4 diseases is very challenging for a lot of reasons
5 about which Peter talked about. Many of these
6 things don't get reported. When the diseases come
7 to medical attention, they don't necessarily get
8 attributed to the exposure at hand unless all of a
9 sudden you get 400,000 people showing up in the
10 emergency room like you did in Milwaukee.

11 I think that's actually one of
12 the nice strengths of the CHEER study is -- that
13 it is another study that is attempting to look at
14 this in a way that identifies prospective diseases
15 that may not occur in outbreaks. Like some of the
16 other surveys that have already been done in other
17 settings that have shown there is an increased
18 risk. None out of those reported outbreaks. They
19 were done through prospective surveillance. We
20 need more of that kind of prospective surveillance
21 to add to the existing body that shows that there
22 are risks associated with that and to try to
23 quantify it.

24 MS. TIPSORD: Excuse me,

1 Dr. Gorelick. Were you just reading from the
2 prior document that was passed out that we did not
3 enter? Surveillance for Waterborne Disease and
4 Outbreaks Associated with Drinking Water.

5 MR. GORELICK: Yes.

6 MS. TIPSORD: And with that then, I
7 think we should probably put it into the record
8 because Dr. Gorelick did read from it. So the
9 Surveillance for Waterborne Disease and Outbreaks
10 Associated with Drinking Water and Water Not
11 Intended for Drinking, United States, 2005, 2006,
12 will be admitted as -- Okay. Fred, I think we
13 gave you back our copies. We're going to admit
14 that as Exhibit 239.

15 MR. ANDES: Yes, I have copies.

16 MS. TIPSORD: That's Exhibit 239 if
17 there's no objection. Seeing none, it's Exhibit
18 239.

19 (Document marked as Group
20 Exhibit No. 239 for
21 identification.)

22 MR. ANDES: Dr. Gorelick, on page 12
23 of your testimony you speak of the problem of
24 waterborne pathogens in the CAWS as a situation

1 that we know is inherently dangerous and that is
2 bound over time to result in severe injury to
3 someone even if that injury cannot be captured in
4 the narrow window of a scientific study. Are you
5 saying we should basically act as if it's
6 inherently dangerous to take action that even if
7 we have no studies that support that finding?

8 MR. GORELICK: No. I'm saying there
9 is scientific evidence to suggest that there is
10 risk and that not finding risk in a single study
11 would not negate that because the risk level might
12 be such that you're not going to capture it even
13 in a reasonable large study like the CHEERS study.

14 MR. ANDES: And that will really
15 depend to some extent, and I think you both
16 testified to this, the nature of the study and
17 really what we find when the results are reported?

18 MR. GORELICK: Yes.

19 MR. ANDES: And I believe you all
20 stated that at that point the Board could consider
21 that information along with other information
22 whether it's carbon footprints, other practical
23 considerations, other -- the other policies and
24 issues. The Board would have to balance in

1 deciding when and how to act to address the issue.

2 MS. ALEXANDER: I object to any
3 characterization of the legal question as to what
4 is appropriate for the Board to consider. Over
5 that objection, you may answer.

6 MR. GORELICK: So the CHEER study is
7 going to provide an additional piece of
8 information in addition to all the knowledge
9 that's been accumulated over the years about risks
10 associated with levels of indicators, the little
11 bit of information we have directly related to
12 secondary contact, microbiologic information, et
13 cetera. I think, again, getting to a point that
14 Peter made earlier in his testimony that I want to
15 second is that let's assume for the moment that
16 the CHEER study finds that there is no increased
17 risk.

18 The fact that it is one study
19 that finds no increased risk would need to be
20 corroborated before you could give too much weight
21 to it. Partly for the reason that Dr. Orris
22 already mentioned, which is that by their name we
23 design studies to be more likely to have a false
24 negative result than a false positive result.

1 So if I have a study with a
2 negative result, it's immediately somewhat
3 suspicious. The second is for the reasons we
4 talked about in terms of whether or not the
5 results would apply to all subgroups and types of
6 activities, et cetera. It's an overall risk.

7 So one could just wait and
8 then -- until the results come in and then decide
9 "Gee, when that result comes in, we're going to
10 have to corroborate it so let's wait another five
11 or eight years until we can get another study
12 corroborating it." Before you know it, you
13 haven't taken action. I would argue that as
14 imperfect as this state of knowledge is, we're not
15 arguing for no information, that the Board has
16 information on which it can base a decision and
17 waiting for that result would potentially prolong
18 that duration of risk unnecessarily while we're
19 waiting for additional information because I don't
20 think we're going to have the answer in a year or
21 two.

22 MR. ANDES: And that depends partly
23 on the extent of the risk, right? If the report
24 says -- were to find conclusive percentages of

1 population that it defined a fair number of those
2 people and that even at significant levels of
3 bacteria in the water that there is no significant
4 increase of risk, but the Board can certainly --
5 and, again, I think we're arguing over legal
6 questions, that the Board can decide that's
7 sufficient information to set a water quality
8 standard based on --

9 MS. ALEXANDER: I'm going to object
10 to the characterization of the study. I think
11 it's a question at issue whether or not the study,
12 the CHEER study ever could get into risk
13 assessment of population. You've been
14 characterizing it as a possibility that it could.

15 MR. ANDES: I don't think -- have
16 either of the experts here testifying -- that it
17 cannot possibly address the risk to the sensitive
18 populations?

19 MR. GORELICK: No, just that it's
20 less likely to.

21 MR. ANDES: Okay. And we'll know
22 better once we see the results, correct?

23 MR. GORELICK: We will know better
24 what the results are. We won't know better

1 whether or not it was less able to find. That's
2 the inherent design of the study, that it is less
3 able to find an association in a lower risk group.

4 MR. ANDES: Less able than in the
5 general populations?

6 MR. GORELICK: That the power in
7 those specific subgroups is lower. That's
8 inherent to the design of the study.

9 MR. ANDES: Of any study?

10 MR. GORELICK: Correct.

11 MR. ANDES: I think those are all
12 the questions I have for these witnesses at this
13 time.

14 MS. TIPSORD: Mr. Harley.

15 MR. HARLEY: Good morning. Keith
16 Harley. Southeast Environmental Task Force. I
17 think I'm maybe more impressed with Mr. Andes'
18 questions than he himself was in light of how many
19 he skipped over, but there are some that I would
20 like to ask you in order to create a study before
21 the Board. One of the questions that I wanted to
22 ask you is actually the very first question posed
23 in the pre-filed questions in which the question
24 quotes from your testimony "disinfection is nearly

1 universal in major cities in the United States.
2 Prevalent in most smaller communities for the
3 simple reason that it is widely recognized as
4 necessary to protect public health." And then the
5 question is, do you believe that the historic
6 practice of waste water disinfection in the United
7 States is justified? I want to ask you that
8 question. Do you believe it is justified?

9 MR. GORELICK: I do. I think there
10 is a large consensus that disinfection is an
11 additional step on top of primary and secondary
12 waste treatment that further improves the quality.
13 The US EPA, I think, shares that assessment. It's
14 possible that all the other major cities in the
15 United States are incorrect on this. I'm not
16 going to say that's not possible, but certainly
17 the weight of the evidence would suggest that
18 disinfection is useful.

19 There have been two papers that
20 were introduced by the District to call that into
21 question. I think finding two articles in 20
22 years doesn't necessarily invalidate a consensus.
23 I think any scientific question you will find some
24 disagreement. I would also say that the

1 characterization of the conclusions of these
2 papers is maybe overstated. I don't think that
3 this paper by Blatchley strongly suggests that
4 disinfection processes are not effective. It
5 states in the abstract, they may not be -- the
6 water quality may not be substantially improved.
7 It's says it's not clear that they are effective.

8 It's a little bit different than
9 saying it strongly suggests that it's not. It is
10 a piece of information. I think there is some
11 useful data in here. The data shows when you take
12 disinfection that levels drop immediately. In
13 some of the circumstances, they then come back
14 later. How that filters into the real world? I
15 don't know.

16 So when I look at the whole body
17 of literature, I would say, yes, this practice
18 still appears to be justified despite these few
19 contrarian positions.

20 MR. HARLEY: Thank you. I wanted to
21 call your attention to question 14. The pre-filed
22 question 14, several of the water samples in the
23 CAWS have levels of e-coli that was found in the
24 urine sample of an infant would be considered a

1 sign of a urinary tract infection. Could you
2 please comment on the way that you came to that
3 conclusion as part of your pre-filed testimony and
4 what that means?

5 MR. GORELICK: I wouldn't place too
6 much emphasis on this. A lot of numbers get
7 thrown around. I was trying to put this into
8 context. If the number is 30 or 60 or 10,000, is
9 that a high number, is that a low number? Without
10 a context, it's difficult to know. The context is
11 is that, again, just for illustration purposes,
12 not because I'm suggesting that the water needs to
13 be treated with antibiotics. I don't want you to
14 read into it. But this is a level that in that
15 clinical circumstance is considered a high level
16 and the reason it's a high level is because it's
17 indicative of, you know -- well, it's a high level
18 because you're not supposed to have that much
19 e-coli in the urine.

20 One of the questions was would
21 that level in feces be of concern? Absolutely
22 not. It's supposed to be there. So the question
23 is, is this number high? Well, high in relation
24 to what? You're not supposed to have feces in

1 river water so the presence of those levels of
2 bacteria are high. You're supposed to have them
3 in your colon. It was intended strictly as an
4 illustration of, you know, what's a high number.
5 A more relevant thing would be what levels have
6 been associated with risk of illness and as I've
7 already said, even relatively low levels, far
8 lower than what was reported in the CAWS have been
9 associated with the risk of illness to people
10 exposed to it.

11 MR. HARLEY: Thank you. Madam
12 Hearing Officer, I have a housekeeping issue
13 related to pre-filed request 10. In pre-filed
14 question 10, Mr. Andes refers to a portion of the
15 testimony in which there's a citation to the Water
16 Reclamation District website and on the Water
17 Reclamation District website on an ongoing basis
18 the District is posting information about the
19 levels of different indicators at different
20 sampling locations throughout the District's
21 jurisdiction.

22 Some of that information for
23 past years has been entered into the record, but
24 new information is constantly being posted by the

1 District with up-to-date contemporary information
2 about the levels of different pathogens, which are
3 at issue in this rulemaking. I was hoping that we
4 could come to some agreement that when it comes
5 time to do our post hearing comments that we would
6 be able to refer to that contemporary levels of
7 pathogens without having to constantly update the
8 record with paper copies of what's found on the
9 District's own website.

10 MR. ANDES: No objection.

11 MS. TIPSORD: I was going to say, I
12 think the best way to handle that is when you get
13 ready to do your final comments, print it out and
14 include it as part of your final copy. And then
15 what the numbers are -- these are the numbers as
16 of this date and cite back to the record. But I
17 think you will have to -- I mean they will have to
18 be placed into your final comment, but I don't
19 think there's any problems with you using data
20 that's still out there in the public domain. When
21 you put it in your public comment, it becomes part
22 of the Board's record.

23 MR. HARLEY: Thank you. Thank you
24 for the clarification and thank you.

1 MS. ALEXANDER: Unless there are
2 other follow up questions, I also am somewhat more
3 impressed with Mr. Andes' questions then he
4 appears to be and I would like to refer to
5 pre-filed question 21A concerning peer review for
6 Dr. Gorelick. The question is in your testimony
7 you referenced a peer review study of diarrheal
8 illness waste in children and the question is, who
9 were the peer reviewers of the study and what were
10 their credentials? Do you know the answer to that
11 or were the peer reviewers anonymous?

12 MR. GORELICK: The process for a
13 peer review for a scientific journal is -- this
14 practice is changing a little bit, but by and
15 large it's conducted anonymously. Peer reviewers
16 are generally selected by editors as expert --
17 disinterested experts who will review a paper to
18 look to -- to critique the paper and look for
19 methodologic flaws to decide whether the methods
20 were appropriate, whether the conclusions are
21 valid, et cetera.

22 So most people feel that that
23 process is best done anonymously because if people
24 know who the reviewers are, they may be less

1 likely to be critical. So all the journals are
2 interactive with -- I think there's one where the
3 peer reviewers can identify themselves if they
4 choose to, but they're not required to. But by
5 and large, they're required to be anonymous.
6 They're selected on the basis of their areas of
7 expertise and most of the time we are asked as
8 peer reviewers to identify whether we have any
9 potential conflicts of interest, either financial
10 or scientific.

11 If somebody is doing a study
12 where they're criticizing a study I've done, I
13 would have to identify that I might have a
14 conflict of interest or if it's somebody from my
15 own institution, I'm generally not permitted or
16 certainly not from within the department to review
17 those papers. That would be considered a
18 potential conflict. So it's anonymous
19 disinterested experts.

20 MS. ALEXANDER: Would you say as a
21 general matter that the presence of absence of
22 peer review is an important factor in assessing
23 the credibility of any scientific study?

24 MR. GORELICK: Yes, I think that's

1 critical. I mean, Peter, you can maybe comment on
2 this as well, but this is a well established part
3 of the scientific process as we currently practice
4 it is that when a study is done and we talked
5 about, you know, a number of studies, the CHEER
6 study and a number of others.

7 There is no perfect study, but
8 being able to really identify what are the
9 strengths of the study, what are the weaknesses on
10 the strengths on balance, counteract the
11 weaknesses, can the conclusions be supported? I
12 think an independent review of that is absolutely
13 critical to ensure that what gets released out
14 into the scientific literature is valid.

15 MS. ALEXANDER: Do you have an
16 understanding of whether the Districts risk
17 assessment is being or has been peer reviewed as
18 you've just defined in the process?

19 MR. GORELICK: I'm not a hundred
20 percent sure, but my understanding is it's not
21 peer reviewed. It wasn't fully submitted for
22 publication. It was an internal document.

23 MR. ANDES: If I can add to the
24 record? I believe there was testimony to the

1 effect that articles are being prepared and being
2 submitted for publication at this point and
3 subject to peer review.

4 MS. TIPSORD: Are there any other
5 follow ups on the District's questions? All
6 right. I think we're ready for the IEPA's
7 questions.

8 MS. WILLIAMS: Good morning --

9 MS. TIPSORD: You'll have to speak
10 up. The mic isn't going to do any good. It just
11 makes everything blend together worse.

12 MR. WILLIAMS: Good morning. I
13 believe Dr. Gorelick has answered my pre-filed
14 question one and I think Dr. Orris and maybe
15 Dr. Dorevitch as well -- and number three. So I'm
16 going to ask pre-filed question number two. What
17 conclusions have you drawn from the tables you
18 include as Exhibit 3 to Dr. Gorelick's testimony
19 and exhibit 2 to Dr. Orris' testimony?

20 MR. ORRIS: Number two was my CV.

21 MR. WILLIAMS: Did I get it
22 backwards?

23 MS. TIPSORD: The Urban Rivers
24 Analysis and --

1 MR. ORRIS: Right. I commented
2 before on the levels, the general levels of these
3 bacteria in these documents and, indeed, orders of
4 magnitude above what was previously studied in
5 some of these small studies of recreational use of
6 waters?

7 MR. GORELICK: I would conclude the
8 same. That these levels are very high and these
9 are levels that in the literature have been
10 associated with risk from exposure albeit it's not
11 studied in the sense of exposure for secondary
12 recreation, but these are levels that would
13 indicate likely very high levels of pathogens.
14 And I would also conclude that the other cities
15 that are treating their water differently have
16 much lower levels and presumably much lower risk.

17 MR. ORRIS: And to go back again for
18 a moment. The studies identified recreational use
19 of waters that were far less contaminated,
20 identified the integration within the bodies of
21 the people using it -- of the pathogenic or even
22 the indicator bacterias and finally correlated
23 illness with that and in some of the studies even
24 on a ghost response basis. And this is all at

1 contamination far lower than is documented here
2 for the CAWS.

3 MR. ANDES: If I can follow up on
4 that? You're not speaking of contamination with
5 regard to actual pathogen levels, you're speaking
6 of indicator bacteria levels, correct?

7 MR. ORRIS: Each one looked at a
8 different set and I believe we are talking about a
9 mixture of both basically.

10 MR. ANDES: Are you aware of any
11 studies showing increased risk due to exposure?
12 I'm going to go back to the risk assessment done
13 by Geosyntec, which reported certain levels,
14 non-detect and low -- of actual pathogens. Are
15 you aware of studies showing that exposure to
16 pathogens at those levels creates increased risk
17 in the secondary contact or even swimming?

18 MR. ORRIS: I would defer to
19 Dr. Gorelick and I thought his analysis was quite
20 persuasive vis a vis that those indicators and the
21 correlation between the pathogenic bacteria and
22 the indicator bacteria --

23 MR. GORELICK: Right. If there is
24 no -- if a particular pathogen is not present in

1 the water, then there would be no risk from that
2 pathogen. It would indicate there is no risk from
3 other pathogens that may not remeasure.

4 MR. ANDES: Okay.

5 MR. WILLIAMS: Do you have the
6 pre-filed questions in front of you? Question
7 four asks Dr. Gorelick -- gives him an opportunity
8 to correct a typo, I believe.

9 MR. GORELICK: Yes, that would have
10 been more hazardous and it's on page 11 of my
11 testimony or is a word so spell check doesn't pick
12 that up.

13 MR. WILLIAMS: Question five for
14 either of you. Why would the District's CHEER
15 study not fully reflect the potential danger of
16 unintended ingestion and significant exposure to
17 especially vulnerable individuals? And question
18 six is who are you referring to when you say
19 vulnerable individuals.

20 MR. GORELICK: Again, vulnerable
21 individuals would be children. Children are
22 considered more vulnerable for a number of
23 reasons. Again, there's no data from secondary
24 recreation, but from swimming we know they swallow

1 more water when they're swimming. I can tell you
2 antidotically, having teenagers they're not
3 particularly careful about anything.
4 Unfortunately, the exact amount of an organism
5 that you need to ingest to become ill isn't known
6 for the large majority of organisms, but there are
7 at least some organisms for which there is data
8 that is actually lower for children.

9 Many of these organisms are
10 organisms that prior infection or prior exposure
11 can induce partial or complete immunity. So
12 somebody who either has not had an opportunity to
13 be exposed because they're a child and they
14 haven't been around as long or somebody who is
15 immune compromised, for example, someone with
16 immunosuppressant medications, somebody with an
17 immune disorder, whether it's acquired like aids
18 or inborn, would be at higher risk because of the
19 lack of that immunity.

20 There's only one study that's
21 actually looked at children specifically in a
22 recreational context and, again, I can see that
23 this is swimming, but they show that children
24 were, in fact, at higher risk than adults and both

1 of them were at higher risks than controls from a
2 swimming exposure. So I'm focusing on children
3 because that's the nature of my business. I take
4 care of kids, but I believe immune compromised
5 individuals, it would be the same.

6 All of those taken together, the
7 power to identify a risk in those populations is
8 lower than the power of the full study because
9 almost certainly not all of the subjects in the
10 study will be children. I'm sure there will be
11 some adults. It may be a small minority of the
12 children. It may be a healthy minority. It may
13 even be a small majority, but the sample size for
14 those populations will be smaller than for the
15 full population and, therefore, the ability to
16 find a risk in them will be reduced.

17 MR. ANDES: If I can follow up? On
18 the immunocompromised people, given that we've
19 talked about combined sewer overflows, storm water
20 runoff, wild life contributions, other significant
21 contributions of bacterial loadings to the CAWS
22 will remain independent of what happens in the
23 rulemaking, wouldn't you advise immunocompromised
24 people not to get in this water body at all,

1 strongly advise them?

2 MR. GORELICK: No. My advice would
3 be, you know, there are a lot of people walking
4 around with immune compromises. I wouldn't advise
5 them to stay at home in a bubble. They're going
6 to go out and do activities. Whatever can be done
7 to minimize those risks of activities should be
8 done. If those risks can be quantified, then we
9 can decide whether the risk is sufficiently high
10 and that given person should or shouldn't engage
11 in it.

12 MR. ANDES: From a precautionary
13 standpoint, wouldn't you tell that kind of person
14 to find another type of recreational activity,
15 perhaps one on a water body that didn't have those
16 issues?

17 MR. GORELICK: They would be better
18 off -- you're right that they would be better on a
19 water body that doesn't have those issues. If the
20 CAWS could become one of those waterbodies, that
21 would be ideal.

22 MR. ANDES: Should we spend public
23 resources and potential carbon footprint impacts
24 of being induced to protect those people who are

1 particularly sensitive?

2 MS. ALEXANDER: I object to that
3 question because this witness is not being offered
4 to testify about carbon impacts or cost or
5 anything like that. You're going way outside the
6 realm of his expertise.

7 MR. GORELICK: I would say in
8 general, it's up to regulatory bodies to decide
9 what should be done to protect the public at large
10 and vulnerable populations. I don't think the
11 fact that it's a vulnerable subpopulation would
12 invalidate their right to be protected from public
13 harm.

14 MR. ANDES: Even though they can
15 easily avoid that risk?

16 MR. GORELICK: I'm not even going to
17 go into things like the American Disabilities Act.
18 People with disabilities can avoid public
19 buildings. We've made a decision that we're going
20 to accommodate them. So, again, that's not an
21 area for epidemiologists or clinicians. That's
22 for regulatory bodies to decide.

23 MR. ORRIS: This question was asked
24 of both of us. I'm a little nervous about several

1 way or other.

2 MR. ANDES: My question was, if I
3 can follow up, is as public health professionals,
4 wouldn't you advise those people on those
5 medications and other conditions -- if we're
6 talking about -- you've talked about risks on this
7 water body. And there would be risks remaining
8 that aren't present on other water bodies even if
9 disinfection is practiced. And I'm trying to ask
10 the question of wouldn't you advise those people
11 to avoid this particular risk if they had other
12 alternatives?

13 MR. ORRIS: Again, you're
14 postulating other alternatives. You're assuming
15 people will leave their communities to exercise.
16 You're balancing the public health value of
17 certain kinds of exercising, et cetera. All of
18 these questions are both translated for an
19 individual by their own physician, but from a
20 public health point of view as we've previously
21 discussed. A lot of these things do not have
22 individual solutions so, for instance, let's look
23 at mercury on the Great Lakes and fish. We target
24 our information to women who are thinking about

1 getting pregnant within the next year or two.
2 Obviously, that's a rather difficult population as
3 they don't self-define themselves that well. So
4 we broaden that out to women in reproductive
5 years.

6 We target the information and
7 our prevention strategies with respect to urging
8 them to eat fish low in mercury, high in ammonium
9 three fatty acids. The problem is you can't
10 identify that as we well defined a few years ago.
11 You go to a restaurant and you have sushi, one
12 fish will have a high level and the next piece
13 looking exactly like it will have a lower level of
14 mercury. The only way to do that process with
15 respect to mercury and protect that subgroup that
16 we are particularly concerned about, pregnant
17 women, because the neurotoxic effect on the child
18 is to reduce the amount of mercury in fish which
19 is why that is the public health advice in general
20 how do we reduce the mercury of fish? How do we
21 catch the mercury coming out of our fossil fuel
22 plants? How do we remove the mercury from health
23 care and other things of the sort? A universally
24 accepted consensus because of its effect on that

1 population. So that is the choice that the Board
2 has to make and has to balance.

3 MR. ANDES: And isn't part of the
4 balance there the fact that fish is an affirmative
5 good, that public health officials generally want
6 people to consume? So we're trying to balance a
7 couple of different factors, which is a little
8 different than a situation of should we -- what
9 public resources should we spend -- let me finish.
10 What public resources should we spend to address
11 bacterial issues on the CAWS with respect to the
12 extent of the risk that is being addressed and, as
13 you have both said, balancing all of these factors
14 and determining how to best spend these public
15 resources, which could be spent also for other
16 purposes?

17 MR. ORRIS: And that's what I really
18 don't understand about the position the District
19 is arguing here, I guess. You know -- and without
20 discussing the public health impact of the lack of
21 exercise, the need to get people out and more
22 exercise and more involved, the need to use our
23 natural resources in Illinois, the possibility of
24 using it by the whole population -- putting that

1 all aside, it would appear and I may be wrong on
2 this because I'm not part of the whole process,
3 the argument you're making is purely an economic
4 argument that says the only reason we're concerned
5 about this is from an economic point of view.

6 This in the face of a -- again,
7 a well acknowledged risk related to polluted water
8 from the time of antiquity, well documented
9 studies, not many of them, that says if you
10 recreationally use polluted water, you get it in
11 your system and it correlates with disease and now
12 you're saying once again we have to reprove that
13 for these particular rivers just around Chicago is
14 beyond me why you would raise that level of proof
15 in the face of such a public health well
16 established consensus.

17 MR. ANDES: But beyond the fact that
18 the first course object to the characterization of
19 the District's testimony which definitely is not
20 that economics is the reason -- economics is not
21 the sole reason for not regarding disinfection.
22 It's simply not accurate at all, but, again, as
23 you've testified, correct me if I'm wrong. The
24 studies you talked about do not deal with

1 secondary contact recreation as practiced in the
2 CAWS and you have not -- and correct me if I'm
3 wrong again. You have not discussed any way to
4 quantify risks from these treatment plants which
5 is where most pathogens are already removed
6 relative to other sources including wildlife,
7 combined sewers and storm water runoff.

8 MS. ALEXANDER: I'm just going to
9 object to that question. I know you asked him to
10 correct you, but I think it's a very vague
11 comparison to say that the studies don't deal with
12 recreation as practiced in the CAWS. I think you
13 need to define that further. With that said,
14 since you've offered it to the witness, you may
15 answer.

16 MR. ORRIS: What she said. I mean
17 you're incorrectly characterizing what I said
18 during the whole morning so, yes, you're wrong
19 about both of the characterizations you made, but
20 I don't want to repeat all the testimony from
21 earlier in the day for the benefit of the Board.

22 MR. GORELICK: If I could get back
23 to this business of vulnerable populations. An
24 analogy I would offer is what's been done with air

1 quality. Air quality now in general is much
2 better than it was 30 years ago. Thirty years ago
3 probably most people with asthma would have been
4 advised not to go out and exercise at all in
5 certain metropolitan areas because the air quality
6 every day was sufficiently bad. That they didn't
7 want you to do that.

8 We're not at the point where in
9 most metropolitan areas where there are ozone
10 alert days where there are certain days of the
11 year -- because we haven't been able to clean the
12 air completely, that people with asthma or other
13 respiratory conditions are advised not to
14 exercise, but the whole rest of the year they can.
15 So instead of saying we're never going to be able
16 to get rid of all the problems so let's not clean
17 up the air, we've managed to decrease the risk to
18 everybody. We've managed to get the risk to a
19 manageable point for a vulnerable subpopulation.
20 The analogy here would be if we can allow people
21 to recreate except the couple of days after a
22 sewer overflow and maybe there would be a health
23 warning with, isn't that a reasonable step to
24 take? And that's been a big public health advance

1 in air quality and I would hope that the Board
2 would consider a similar approach for the water
3 quality.

4 MR. ANDES: Let me ask. Part of the
5 basis for what you're assuming is the -- mentions
6 that the facts of these other sources are
7 transient. Have you reviewed the testimony of
8 other witnesses indicated in the fact that
9 loadings from wet weather, the last four days
10 after and at significant portions of the year are
11 effected by wet weather loadings?

12 MR. GORELICK: I'm not familiar with
13 that in the CAWS specifically.

14 MR. ANDES: So it's hard to say
15 really, correct me if I'm wrong again, it sounds
16 like it's hard to say to what extent the risk on
17 the CAWS would be reduced by disinfection because
18 you don't know the extent of the risk posted by
19 other sources versus the --

20 MS. ALEXANDER: We need
21 clarification. Hard for anyone to say or hard for
22 this witness to say? This witness has testified
23 that he has not reviewed all the information about
24 exactly how long wet weather events are measured

1 on the CAWS. So I don't think he can answer it at
2 all. That's a separate question from whether
3 anybody can.

4 MR. GORELICK: I cannot answer that
5 question.

6 MR. ANDES: Thank you.

7 MS. TIPSORD: Ms. Williams.

8 MR. WILLIAMS: Just a couple more
9 follow up. Have one of you reviewed Dr.
10 Dorevitch's testimony? Has anyone reviewed that?

11 MR. ORRIS: I reviewed it briefly,
12 not entirely.

13 MR. WILLIAMS: If you don't recall
14 the answers to this, that's fine, but I seem to
15 recall Dr. Dorevitch was asked a similar question
16 that you two were just asked about whether or not
17 he would recommend his patients recreate in the
18 CAWS. Do you recall what his answer to that was?

19 MR. ORRIS: No. What did he say?

20 MS. WILLIAMS: That's fine. We'll
21 let the transcript speak for itself. I don't
22 recall.

23 MR. WILLIAMS: Are either of you
24 familiar or able to articulate the Agency's

1 proposal with regard to control of bacterial
2 contamination in this rulemaking?

3 MR. GORELICK: The specifics you
4 mean?

5 MR. ANDES: You're asking them to
6 characterize --

7 MR. WILLIAMS: Do they know? Are
8 they familiar with it? Do they know it's in the
9 proposal?

10 MR. GORELICK: Just in some sense
11 which is that disinfections be required to get
12 below a certain level of indicator organisms as I
13 understood it.

14 MR. WILLIAMS: So question 17 from
15 the District -- I'd like to go back to one that I
16 thought I liked that I skipped. Do you believe
17 that the proposed fecal coliform limits, which as
18 you described requires disinfection to get below a
19 certain level, for the waste water reclamation
20 plants will sufficiently protect the general
21 public?

22 MR. GORELICK: Again, that's
23 sufficient -- I think it's a regulatory question.
24 Will it decrease at the risk of the general

1 public? I think it will.

2 MR. WILLIAMS: Okay. That's all I
3 have for these witnesses. Thank you.

4 MS. TIPSORD: Anything else for
5 Dr. Orris or Dr. Gorelick?

6 MR. ANDES: We're fine.

7 MS. TIPSORD: Thank you, both, very
8 much. We appreciate your testimony. And with
9 that, let's go ahead and take lunch and come back
10 in about an hour and we'll go to Dr. Van Bonn.

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

14 MS. TIPSORD: Good afternoon,
15 everyone. I hope you had a nice lunch and I think
16 we're ready to start now with the testimony of
17 Dr. William Van Bonn. Is it Van Bonn or Van Bonn?

18 MR. VAN BONN: Van Bonn.

19 MS. TIPSORD: From the Shedd
20 Aquarium. Ms. Meyers, would you like an opening
21 statement or are you ready to proceed?

22 MS. MEYERS: We're able to proceed.

23 MS. TIPSORD: If there's no
24 objection -- Wait. Swear him in first.

1 WHEREUPON:

2 DR. WILLIAM VAN BONN
3 called as a witness herein, having been first duly
4 sworn, deposeth and saith as follows:

5 MS. TIPSORD: We will enter the
6 testimony of Dr. William Van Bonn as Exhibit 240
7 if there's no objection. Seeing none, it is
8 Exhibit 240.

9 (Document marked as Group
10 Exhibit No. 240 for
11 identification.)

12 MS. TIPSORD: And I think we have
13 questions pre-filed from the District. Mr. Andes.

14 MR. ANDES: Thank you. Good
15 afternoon. On page one of your testimony, you
16 state that the massive influx of effluents from
17 waste water treatment plants is one of the notable
18 human impacts on the CAWS, but you also mentioned
19 reversing the flow of the Chicago River, which
20 obviously led to the creation of the Chicago area
21 waterways. Did you consider the relative impacts
22 on wildlife or recreation of the system versus the
23 waste water treatment plants?

24 MR. VAN BONN: Yes, I did, which is

1 the reason I mentioned the reversal, the flow
2 reversal of the river, but my testimony really is
3 to the risks of undisinfected effluents discharged
4 into those systems.

5 MR. ANDES: Do you know what the
6 present levels of pathogens in the effluents are?

7 MR. VAN BONN: I am aware of a risk
8 assessment study that was conducted where there
9 were some pathogens innumeration. I don't know of
10 current levels. I don't have today's numbers, but
11 I'd be happy to look at them.

12 MR. ANDES: Are you aware of the
13 conclusions of that risk assessment in terms of
14 the significance of risk on the waterways?

15 MS. MEYERS-GLEN: I'm sorry. I'm
16 trying to track where you are as far as questions.
17 You seem to be bouncing around a little bit.
18 Where are you as far as questions?

19 MR. ANDES: Question number four was
20 about the present level -- 4A was the present
21 level of pathogens and then I was following up
22 from that because Dr. Van Bonn referred to the
23 risk assessment report. So I was asking some
24 questions what else he might be aware of in the

1 risk assessment report.

2 MR. VAN BONN: I took a cursory look
3 at the risk assessment report to familiarize
4 myself with what pathogen had been reported. I'm
5 not familiar with the overall report in detail.

6 MR. ANDES: Okay. On page three,
7 you stated the natural systems are complex and
8 subject to multiple factors. Can you explain what
9 those factors are?

10 MR. VAN BONN: Natural systems, I
11 believe, are very complex and I think it's very
12 difficult to characterize them completely. I
13 think that when people discuss natural systems,
14 they tend to break them down into complex parts
15 and they talk about the biotic components or the
16 abiotic components or a variety of different
17 cycles, the nitrogen cycle, the carbon cycle,
18 these sorts of means to try to characterize a
19 very, very complex system and it's not easy to
20 capture it in one simple explanation. I do
21 have -- there's some good examples of the people
22 that have tried to characterize samples or systems
23 as natural systems. One is a paper that describes
24 the human influence on land based systems, but

1 demonstrates or diagrams some of the inputs to the
2 system and how complicated it can be and that's a
3 paper by Papislol (phonetic).

4 MS. MEYERS-GLEN: And I'd like to
5 offer, just so you all can see what he's talking
6 about, as an exhibit entitled Unhealthy Landscapes
7 Policy Recommendations on Land Use Changes --

8 MS. TIPSORD: Stacy, can I get a
9 couple more copies?

10 MS. MEYERS-GLEN: Absolutely. I'm
11 sorry. Land Use Change and Infectious Disease
12 Emergence.

13 MS. TIPSORD: If there's no
14 objection, we will mark this as Exhibit 241.
15 Seeing none, it's Exhibit 241.

16 (Document marked as Group
17 Exhibit No. 241 for
18 identification.)

19 MR. VAN BONN: So there's -- that
20 has a diagram on page 1096 there that -- this is
21 one example of -- attempts to characterize very
22 complex natural systems and, again, this example
23 happens to be a land use example. There are
24 similar attempts with marine systems. There was a

1 recent article in BioOne that describes -- it
2 doesn't have any diagrams, but it describes
3 similarly the influences of many different
4 factors, inputs, to natural systems. And it is
5 directed specifically towards marine environments.

6 MS. MEYERS-GLEN: Actually, if I
7 could just real quickly. I should have done this
8 all in one swoop. I'd also like to introduce that
9 article into evidence at this time.

10 MS. TIPSORD: If there's no
11 objection, we will enter Sea Sickness, the Upsurge
12 in Marine Diseases by Yvonne Baskin as Exhibit 242
13 if there's no objection. Seeing none, it's
14 Exhibit 242.

15 (Document marked as Group
16 Exhibit No. 242 for
17 identification.)

18 MR. ANDES: How would these factors
19 and analyses pertain when we're talking about a
20 non-marine extensively altered environment,
21 including waterways that were artificially
22 created?

23 MR. VAN BONN: If those waterways
24 are continuous with or connected to other

1 waterways, I would expect a lot of natural
2 influences to be very similar, the inputs to be
3 very similar to the systems. You know, any of
4 those that are connected are going to have life
5 that is able to move back and forth between
6 different components of the systems.

7 MS. MEYERS-GLEN: If I may follow up
8 with something? In looking at marine systems and
9 the complexity for potential movement in
10 conversation, how would that compare to, say,
11 terrestrial --

12 MR. VAN BONN: Aquatic systems both
13 marine and fresh have a very high density of
14 microbes in the water column. As a general rule,
15 there's lots and lots of microbes in the water
16 column. So it's even more -- my understanding is
17 it's even more microbial rich than, say,
18 terrestrial environments.

19 MS. MEYERS-GLEN: And is that
20 supported by the BioOne article?

21 MR. VAN BONN: Yes.

22 MS. ALEXANDER: What's the
23 difference when you're looking at pathogens in
24 a marine environment and that in a fresh water

1 environment as far as pathogens being able to
2 survive and move around in either one of those
3 environments?

4 MR. VAN BONN: Pathogens that are
5 adapted to a particular environment will have a
6 harder time -- well, sometimes will have a harder
7 time in the opposite environment. So fresh water
8 adapted pathogens oftentimes will have difficulty
9 in marine or salt water environments and vice
10 versa. There are always pathogens that can do
11 both.

12 MS. MEYERS-GLEN: I'm sorry. I
13 wasn't clear. If you have a -- say, the same form
14 of giardia in a marine environment in a fresh
15 water environment, would there be as far as
16 explaining -- does the density of the richness of
17 the pathogens -- let me rephrase that. I'm not
18 being clear. Sorry. If you have a certain form
19 of giardia that's within a marine environment, how
20 would that translate if you had concerns with a
21 fresh water environment?

22 MR. VAN BONN: I'm not sure I still
23 understand the question. Giardia can be found in
24 both of those environments.

1 MR. ANDES: We can move on. On page
2 four, you make a statement concerning how
3 disinfecting waste water will lead to a more
4 natural balance, healthy ecosystem. Can you
5 explain how disinfecting the treated waste water
6 at the District's plants will lead to a more
7 natural balance of aquatic ecosystem into the
8 CAWS?

9 MR. VAN BONN: I don't believe it's
10 natural to collect and hold and consolidate waste
11 and then discharge them as undisinfected point
12 sources into a water system. If that practice is
13 discontinued, it will more approximate a natural
14 system.

15 MR. ANDES: You're aware that this
16 isn't the national system, right? So removing --

17 MS. MEYERS-GLEN: Objection. There
18 was no answer and I would like for the witness to
19 be able to answer before --

20 MR. ANDES: Sure.

21 MR. VAN BONN: I have a question.
22 What are you referring to as this?

23 MR. ANDES: The Chicago Area
24 Waterways System, the proposed waterway is about

1 70 percent treated effluent from the District's
2 plants.

3 MR. VAN BONN: Are contiguous with
4 the surrounding environment, the natural system
5 or --

6 MR. ANDES: Not really. We're
7 talking about this system as a whole. We're not
8 talking about Lake Michigan. We're not talking
9 about the Mississippi. We're talking about this
10 system, which is extremely artificial. So what I'm
11 trying to understand is what is the benefit
12 besides the fact that it's not natural to have
13 waste water treatment plants, how is specifically
14 disinfecting the treated waste water, biologically
15 treated waste water, from the District's plants
16 going to improve the aquatic ecosystem?

17 MR. VAN BONN: Disinfecting an
18 effluent will change the characteristics of that
19 effluent, which will more closely approximate a
20 natural system wherever it's discharged. So I'm
21 still not sure --

22 MR. ANDES: Do you have any evidence
23 that current levels of bacteria in the water
24 column in the system are adversely effecting

1 aquatic life in any way?

2 MR. VAN BONN: I am not aware of any
3 specific survey or health assessment done on
4 aquatic life or mammals in the area. The health
5 assessment that I referred to and I'm familiar
6 to -- familiar somewhat with, to my understanding,
7 was a human health risk assessment and I'm not
8 aware of any similar documents for animal health.

9 The animals are presumably
10 living in that water whether -- regardless of how
11 long the water has been there. It's contiguous
12 with systems that have animals, natural
13 populations in them. They're sharing it. The
14 water is free to move.

15 MS. MEYERS-GLEN: If I may ask a
16 follow up to that?

17 MR. ANDES: Sure.

18 MS. MEYERS-GLEN: You previously
19 testified that you looked at MWRD's microbial risk
20 assessment and saw pathogens listed in that
21 report, is that correct?

22 MR. VAN BONN: Yes.

23 MS. ALEXANDER: And those pathogens
24 were present in the treated effluent of MWRD

1 released into the Chicago area waterways, is that
2 correct?

3 MR. VAN BONN: The tables that I
4 reviewed had a number of sample cites listed which
5 included upstream, downstream, outfall and I'm not
6 sure where all the samples were collected, but my
7 assumption is it includes effluent from the
8 treatment plants.

9 MS. MEYERS-GLEN: And as an animal
10 care specialist at Shedd and director of their
11 animal health program, do you work with any
12 species that are present in the CAWS?

13 MR. VAN BONN: At the Aquarium, we
14 house a number of animals that are probably found
15 in the CAWS, including the river otters. We also
16 house closely related sea otters and we maintain
17 those animals in artificial systems or close
18 systems in the building.

19 MS. MEYERS-GLEN: And are their
20 pathogens in effluent that you would be concerned
21 with as far as exposure to river or sea otters
22 within the Shedd Aquarium?

23 MR. VAN BONN: Yes.

24 MS. MEYERS-GLEN: Can you name a

1 few?

2 MR. VAN BONN: Well, giardia, as you
3 mentioned, toxoplasmosis, toxoplasma. Both of
4 those have infected sea otters and river otters.

5 MR. ANDES: If I can follow up? Are
6 you saying you found toxoplasmosis in the risk
7 report?

8 MR. VAN BONN: Say that again.

9 MR. ANDES: Or significant levels of
10 giardia in the risk assessment report into the
11 CAWS?

12 MR. VAN BONN: No, I said those are
13 pathogens that have been described in effluent
14 from treatment plants, to my understanding, and
15 those particular pathogens can infect otters.

16 MR. ANDES: And how many river
17 otters have ever been seen in the CAWS?

18 MS. MEYERS-GLEN: Are we going to
19 question nine, is that where you want to go?

20 MR. ANDES: Yes.

21 MS. MEYERS-GLEN: Okay.

22 MR. VAN BONN: By whom?

23 MR. ANDES: I believe in your
24 testimony you reference a single sighting of a

1 river otter.

2 MR. VAN BONN: My testimony
3 references a sighting that was listed in the
4 newspaper, several articles. The sighting was by
5 a biologist from the Forest Preserve District to
6 my understanding.

7 MR. MEYERS-GLEN: Actually, if we
8 could figure out exactly what pre-filed question
9 we're on that would be great.

10 MR. ANDES: Nine P.

11 MS. MEYERS-GLEN: Nine G. Okay.

12 MR. ANDES: Nine, generally, I would
13 say. We're investigating river otters.

14 MS. MEYERS-GLEN: So actually if
15 we're referring to the sighting --

16 MR. ANDES: We can start with the
17 earlier questions first. What's the basis, first,
18 that maybe river otters are indigenous
19 particularly when significant portions of the
20 system didn't exist previously?

21 MS. MEYERS-GLEN: I would object to
22 that as your characterization of what did or did
23 not exist. There's no basis for that and --

24 MR. ANDES: Really? There's no

1 basis for it?

2 MS. TIPSORD: I'm going to sustain
3 and really, Fred, you need to stop. You're doing
4 a lot of editorializing in your questions and
5 leaving them hang there. So unless you want me to
6 swear you in and start testifying --

7 MR. ANDES: No, that's fine.

8 MS. TIPSORD: I'm going to sustain
9 that. I think the record speaks for itself as how
10 the Chicago area waterway has been developed.

11 MS. MEYERS-GLEN: So question 9A?

12 MR. ANDES: Yes.

13 MR. VAN BONN: Nine A as listed in
14 your pre-filed?

15 MR. ANDES: Yes.

16 MR. VAN BONN: My feeling that the
17 CAWS is contiguous with natural waterways within
18 the known historical geographic range of otters
19 and that there are a number of people who can
20 attest to the presence of otters here
21 historically -- here historically that otters have
22 been present almost everywhere in North America
23 except the desert southwest and the arctic. So
24 otters historically have been present in this

1 geographic region.

2 MR. ANDES: Okay.

3 MS. MEYERS-GLEN: Actually, there's
4 an article right here. At this point, in order to
5 basically exemplify that point, there's an article
6 by Bob Bluett, the Wildlife Diversity Program
7 Manger of the Department of Natural Resources
8 Division of Wildlife Resources that at this time I
9 would like to ask to be admitted into evidence.

10 MS. TIPSORD: If there's no
11 objection, we will enter this exhibit dated --
12 it's an exhibit dated January 2007. Outdoor
13 Illinois -- In Illinois, the River Otter Got a
14 Shove from Endangered to Common Status.
15 Over-achievers. We'll admit this as Exhibit 243
16 if there's no objection. Seeing none, it's
17 Exhibit 243.

18 (Document marked as Group
19 Exhibit No. 243 for
20 identification.)

21 MS. TIPSORD: I do have one
22 clarifying question. Is this the entire article
23 or the first page?

24 MS. MEYERS-GLEN: That's the entire

1 article.

2 MS. TIPSORD: Thank you.

3 MR. ANDES: So this article is not
4 with reference to the one river otter sighting,
5 correct?

6 MR. VAN BONN: This article is not
7 in reference to the one river otter sighting that
8 I mentioned in the testimony, correct.

9 MS. MEYERS-GLEN: This article is in
10 response to question 9A, correct, and not the
11 sighting that is a question further down in the
12 pre-filed questions?

13 MR. VAN BONN: Correct.

14 MR. ANDES: So what you're saying is
15 river otters are indigenous to the area, but the
16 statement that river otters were indigenous to the
17 CAWS you're assuming based on the fact that they
18 were present throughout the area?

19 MR. VAN BONN: Correct.

20 MR. ANDES: What do river otters
21 eat?

22 MR. VAN BONN: There are various
23 reports of what river otters eat. They tend to be
24 opportunistic. They eat fish, prey fish,

1 invertebrates. There are a number of places that
2 describe things that they've been maintained on in
3 captive settings. At the Aquarium, we feed them a
4 wide variety of things. I believe they're fairly
5 opportunistic.

6 MR. ANDES: Do you know if the CAWS
7 would have adequate food sources for river otters?

8 MR. VAN BONN: I don't know
9 personally what the status of the potential food
10 sources are in the CAWS. I know that there has
11 been previous testimony in the proceedings
12 regarding different types of fishes in the CAWS.
13 You'd need to speak to a field biologist about
14 what is present and the abundance.

15 MS. ALEXANDER: Sir, if I may follow
16 up. Are you familiar with articles pertaining to
17 the river otter sighting on December 12th, 2007?

18 MR. VAN BONN: That's the one that's
19 in my testimony, yes.

20 MS. MEYERS-GLEN: Correct. And that
21 was a river otter sighting downtown behind the
22 Lyric Opera House on the Chicago river system?

23 MR. VAN BONN: Yes.

24 MS. ALEXANDER: And in those

1 articles is there a wildlife biologist from Cook
2 County Forest Preserve District referenced by the
3 name of Chris Anchor.

4 MR. VAN BONN: Yes.

5 MS. ALEXANDER: And did he talk
6 about food sources as far as having tons and tons
7 of carp available within the Chicago River?

8 MR. ANDES: Are we going to
9 introduce that document?

10 MS. MEYERS-GLEN: Yes. Absolutely.

11 MR. VAN BONN: That is his
12 statement.

13 MS. MEYERS-GLEN: And at this time
14 I'd like to introduce into evidence --

15 MR. ANDES: What kind of habitat do
16 river otters require to be successful?

17 MS. MEYERS-GLEN: If we could just
18 wait one second while I pass these out, I'd
19 greatly appreciate it. There are two newspaper
20 articles that are attached, that are both relevant
21 to the river otter sighting that I'm sure we're
22 going to get to next as well as this question at
23 hand.

24 MS. TIPSORD: I've been handed what

1 has obviously been downloaded from the Internet
2 with two river otters on the front. On The Otter
3 Hand is the title of the first and Otterly
4 Amazing. They're everywhere. Is the title of the
5 second. The second is December 12th, 2007, by
6 Maureen O'Donnell. The first is by Margaret Lyons
7 also December 12th, 2007. If there's no
8 objection, we'll mark these as Exhibit 244.
9 Seeing none, they're Exhibit 244.

10 (Document marked as Group
11 Exhibit No. 244 for
12 identification.)

13 MR. ANDES: In terms of what they
14 eat, it sounds like they're eating road kill?

15 MR. VAN BONN: I'm sorry. I had two
16 questions in front of me.

17 MR. ANDES: In reading the article,
18 it sounds like these otters are eating road kill?

19 MR. VAN BONN: I thought you asked
20 what type of habitat was required.

21 MR. ANDES: I did. You can answer
22 that one first.

23 MR. VAN BONN: The habitat is
24 required to whatever will support their prey and

1 amphibious lifestyle.

2 MR. WILLIAMS: Can we ask what they
3 eat?

4 MR. VAN BONN: What they eat?

5 MS. MEYERS-GLEN: What their
6 preferred diet is.

7 MR. VAN BONN: As I mentioned, they
8 eat a variety of food items. They eat fish,
9 invertebrates, mollusks. They're fairly
10 opportunistic. At the Aquarium, we feed them all
11 of those things. With reference to the question
12 about road kill, I believe there was a statement
13 in that article or several of the articles where
14 the -- Mr. Angus or someone has observed the
15 animals feeding on road kill. I don't believe
16 that they exist predominately on road kill.

17 MS. MEYERS-GLEN: If I may follow
18 up? On the sighting along the Chicago River that
19 was right by the Lyric Opera House, when Chris
20 Angus had the opportunity to spy a river otter
21 there, did he also see any evidence of what they
22 would possibly be eating at that location?

23 MR. VAN BONN: This story refers to
24 a cone shaped pile of fish scales and carp and

1 that's a typical otter behavior to -- at a feeding
2 station is to have an accumulation of food items
3 or debris in a pile and that's what he's referring
4 to.

5 MR. ANDES: So all of this,
6 including eight spots with otters in county
7 waterways, this is all happening and the District
8 is not disinfecting its treatment plants, right?
9 The otters are coming back right now with no
10 disinfection?

11 MR. VAN BONN: It appears that
12 otters are here currently.

13 MR. ANDES: Do we have any
14 indication that they're suffering adverse effects
15 from lack of disinfection?

16 MR. VAN BONN: As I mentioned
17 before, I'm not aware of any health assessment on
18 these otters or any surveillance. Maybe there
19 would be 50 times as many as there have been
20 sighted if there was disinfection.

21 MR. ANDES: That would be
22 speculation?

23 MR. VAN BONN: It would be.

24 MR. ANDES: Why would you believe

1 that the population would multiply if there was
2 disinfection of the District's treatment plant?
3 What's the technical basis for that?

4 MR. VAN BONN: I said in
5 speculation. You mentioned that the otters appear
6 to be here in spite of the fact that there's no
7 disinfection and the question is if there were
8 disinfection, how would they change that and I
9 can't answer that.

10 MR. ANDES: Thank you.

11 MS. MEYERS-GLEN: Can you please
12 discuss why you feel it is important that
13 pathogens are eliminated through or reduced
14 greatly through disinfection for otters in the
15 CAWS? What's the general principal behind why
16 this is important?

17 MR. VAN BONN: As I mentioned
18 before, a natural system does not include
19 collecting, consolidating, holding and then
20 discharging billions of gallons of undisinfected
21 sewage effluent. That effluent will contain
22 pathogens, potential pathogens, organisms that
23 can, in fact, infect and cause disease in animals
24 and otters are one example. It's a health --

1 optimum health is about a balance as I mentioned
2 in my testimony and with influencing some of those
3 factors, the many factors of natural systems to
4 upset that balance, tip the balance in favor of
5 the organism or the pathogen and you will have
6 something less than optimal health, which we refer
7 to as disease or illness. If the effluent does
8 not contain pathogens, the risk of that happening
9 is reduced.

10 MR. ANDES: You're aware that there
11 are other sources of fecal sources to the
12 waterways such as combined sewers, storm water
13 runoff and wildlife, correct?

14 MR. VAN BONN: Sure. Natural
15 systems have many inputs. If the effluent is
16 disinfected, the risk from the effluent will be
17 reduced.

18 MR. ANDES: So you haven't assessed
19 to what extent the risk is doing to its other
20 sources and would remain even after the
21 disinfection would have occurred?

22 MR. VAN BONN: No. I'm discussing
23 the effluent risks. The other risks, I have not
24 assessed.

1 MR. ANDES: And you actually haven't
2 assessed the effluent risk itself in any
3 quantitative way, correct?

4 MR. VAN BONN: Only in looking for
5 documentation of the presence of the pathogens and
6 having some sense of the volume of discharge.

7 MR. ANDES: When you're looking at
8 the presence of pathogens and you refer to the
9 risk assessment report, that's ambient water
10 quality data from a variety of sources, right?

11 MR. VAN BONN: Well, as I mentioned,
12 I'm not sure of all the sources of where they
13 were. I looked at a number of tables that listed
14 the presence of microbes that can be pathogenic
15 and it appears to me that that's from effluent of
16 the treatment plants.

17 MS. MEYERS-GLEN: If I could follow
18 up? Exactly, do you know what charts you looked
19 at as far as within the microbial risk assessment
20 to show exactly where you found the pathogens
21 within MWRD's effluent that was then discharged
22 into the CAWS?

23 MR. VAN BONN: I looked at a number
24 of the different charts. I looked at the report a

1 number of times, charts that I recall are --

2 MS. ALEXANDER: It's question four
3 by the way.

4 MR. VAN BONN: -- the tables 3-2A,
5 tables 3-3A through C and table 3-4A through C.
6 All of those tables, I believe, show the presence
7 of pathogenic microorganisms in a number of the
8 samples.

9 MR. ANDES: From the waterways?

10 MR. VAN BONN: From a number of
11 locations. All the locations listed in the
12 tables.

13 MS. MEYERS-GLEN: Did you also have
14 the opportunity to review testimony provided by
15 Richard Lanyon, general superintendant of MWRD, in
16 the proceeding?

17 MR. VAN BONN: I did, yes.

18 MS. ALEXANDER: And do you know -- I
19 guess we're going back to question four.

20 MR. VAN BONN: I lost where we are.

21 MS. ALEXANDER: Sorry. We're on
22 question four. As far as recalling his testimony,
23 do you recall whether or not he made any
24 statements regarding the fecal coliform units that

1 were found within the treated effluent of MWRD for
2 the Calumet, Stickney and North Side plants?

3 MR. VAN BONN: Yes, I think you're
4 referring to the testimony of Richard Lanyon on
5 September 8th, 2008.

6 MS. MEYERS-GLEN: Correct.

7 MS. TIPSORD: Excuse me. For the
8 record, that's Exhibit 60.

9 MR. VAN BONN: There were some
10 questions about the number of microbes in the
11 water, in the effluent, and there was a statement
12 made that the fecal coliform colony forming units
13 can be as high as 200,000 per 100 mill. and that
14 was the same as for the treated effluent
15 discharged at Calumet, Stickney and the North Side
16 treatment plants.

17 MR. ANDES: So now you're saying
18 your conclusions are not based on looking at the
19 risk assessment report, but looking at
20 Dr. Lanyon's testimony?

21 MR. VAN BONN: No. I'm not saying
22 that. I'm saying that the conclusions are based
23 on looking at both of them.

24 MR. ANDES: But I asked you what

1 data as to effluents you looked at and didn't you
2 point to something in particular in your risk
3 assessment report that was effluent data?

4 MR. VAN BONN: The tables that I
5 referred to have microbes listed that are effluent
6 data as I understand it.

7 MR. ANDES: And sample stations, am
8 I right?

9 MR. VAN BONN: I don't know where
10 all the sample stations are.

11 MR. ANDES: So you don't know where
12 those were effluent pipes or not?

13 MR. VAN BONN: That's correct.

14 MS. MEYERS-GLEN: As a follow up.
15 Was one of the columns on the charts that you
16 looked at labeled outfall?

17 MR. VAN BONN: Yes.

18 MS. MEYERS-GLEN: And are you aware
19 of whether or not that was taken directly at the
20 outfall or near the outfall?

21 MR. VAN BONN: I don't know where
22 the actual sampling sites are. I'm assuming the
23 outfall means the output or the outfall.

24 MS. ALEXANDER: And did you rely on

1 that to determine whether or not the effluents in
2 the outfall of those treatment plants potentially
3 contained the pathogens that were on that chart?

4 MR. VAN BONN: Yes.

5 MR. ANDES: What specific pathogens
6 were you talking about?

7 MR. VAN BONN: I'd have to look back
8 at the charts, but if I can read them off of
9 there.

10 MS. TIPSORD: Just for the record.
11 We're talking about the risk assessment, which is
12 Exhibit 71, are we not?

13 MS. MEYERS-GLEN: That's correct.

14 MS. TIPSORD: Then in that case, we
15 need to know what page numbers you're looking at
16 in both charts.

17 MR. VAN BONN: It's tables 3-2A,
18 3-3A through C, 3-4A through C.

19 MS. ALEXANDER: And, unfortunately,
20 the copy of the risk assessment that I have that
21 was tendered into evidence did not have page
22 numbers. So I went by table numbers instead.

23 MS. TIPSORD: As long as we have
24 table numbers, that's fine.

1 MR. VAN BONN: So table 3-2A lists a
2 number of sampling sites, locations and dates and
3 then has some numerical data for a number of
4 potential pathogens, including salmonella,
5 pseudomonas aeruginosa, aerucrocis (phonetic),
6 fecal coliform and e-coli are also listed there.

7 MR. ANDES: And what information are
8 you relying on here, which particular data are we
9 talking about? I'm trying to figure out where
10 you're identifying the risk to wildlife from the
11 levels in the CAWS of indicators or pathogens or
12 both.

13 MR. VAN BONN: Let's look at the
14 North Side site. The location listed as outfall
15 and then under pseudomonas aeruginosa, the value
16 of 1,091.

17 MR. ANDES: Does pseudomonas come
18 from soil?

19 MR. VAN BONN: Pseudomonas is a
20 potential pathogen.

21 MR. ANDES: Does it come from soil?

22 MR. VAN BONN: Pseudomonas
23 aeruginosa can come from -- is present in a lot of
24 places, but you can probably find it in soil.

1 MS. MEYERS-GLEN: If I may, I have a
2 follow up question here because I'm confused. Are
3 you looking to these charts in response to the
4 initial question, which was whether or not there
5 are pathogens from MWRD's effluent in the CAWS or
6 are you trying to use these numbers in the study
7 as a basis for reducing the risk? What was the
8 intent of your review?

9 MR. VAN BONN: The intent was to
10 determine whether there were pathogens in the
11 effluent. I'm not conducting a risk assessment.
12 I don't know of one that's been conducted for
13 nonhuman animals in that area.

14 MR. ANDES: So you're conclusions
15 are based simply on the fact that pathogens are
16 present?

17 MR. VAN BONN: Correct.

18 MR. ANDES: Okay.

19 MS. MEYERS-GLEN: And that was in
20 response to the question of whether or not
21 pathogens were present in the CAWS, correct?

22 MR. VAN BONN: Correct.

23 MR. ANDES: I'll move on. On
24 question number 11, your testimony discussed

1 toxoplasmosis, which is caused by a parasite in
2 cat feces and you state that cat feces in
3 discarded litter is being found in contaminated
4 waste water. Do you have any information showing
5 that that parasite is present in treated effluent
6 from waste water treatment plants?

7 MR. VAN BONN: There's been a lot of
8 attention focused on the potential role of
9 domestic cats in transmission of that particular
10 parasite and the role of -- and in particular with
11 relation to sea otter health. Toxoplasmosis is
12 one of the leading causes of recognized death in
13 sea otters and there are a number of
14 investigations into the source of the oocysts that
15 do suggest treated effluents may be a source.

16 MR. ANDES: Treated effluents may be
17 a source. Do you have any report that documents
18 that?

19 MR. VAN BONN: Well, there's a
20 number of things. There's an article by Jessup in
21 the Journal of the American Veterinary Medical
22 Association that shows a spacial-association with
23 this disease and some waste water treatment
24 plants.

1 MS. MEYERS-GLEN: Would that be Sea
2 Otters in a Dirty Ocean?

3 MR. VAN BONN: Yes.

4 MR. ANDES: Is that regarding
5 California discharges, California coasts?

6 MR. VAN BONN: This is a commentary
7 in the American Journal of Veterinarian Medicine
8 and it's specifically focusing on some issues in
9 California, but it talks about ocean health.

10 MS. MEYERS-GLEN: If I may ask to
11 enter this into evidence so that folks can see
12 what we're talking about.

13 MR. ANDES: You're aware that ocean
14 discharges don't always receive the same level of
15 treatments?

16 MS. TIPSORD: Let me finish marking
17 this as an exhibit and let her get back to her
18 seat.

19 MR. ANDES: Okay.

20 MS. TIPSORD: If there's no
21 objection, we'll mark commentary, Sea Otters in a
22 Dirty Ocean, David A. Jessup and Melissa A. Miller
23 and that's all I'm going -- et al -- from December
24 1st, 2007, as Exhibit 245 if there's no objection.

1 Seeing none, it Exhibit 245.

2 (Document marked as Group
3 Exhibit No. 245 for
4 identification.)

5 MS. TIPSORD: Okay. Mr. Andes, go
6 ahead.

7 MR. ANDES: You're aware of the fact
8 that this chart is -- marine discharges aren't
9 always subject to the same treatment requirements
10 including -- until sometime ago ocean disposal of
11 raw sludges was allowed?

12 MR. VAN BONN: I'm not sure I
13 followed the question. Can you ask that again?

14 MR. ANDES: Well, you're earlier
15 statement was that you felt that there was
16 evidence that treated effluents were causing this
17 problem and I'm trying to understand are we
18 talking about treatment, the secondary treatment
19 of effluents discharged by the District or are we
20 talking about ocean discharges that aren't always
21 subject to those requirements?

22 MR. VAN BONN: What I said was there
23 was some evidence, several pieces of evidence that
24 suggest that effluent streams may be a source for

1 infection -- infected oocysts of toxoplasmosis.
2 The one I gave you is one. There's another study
3 by Kourenti, et al, in 2003 which talks about the
4 infectivity of the oocysts in contaminated water
5 after some aspects of treatment, after
6 flocculation.

7 MR. ANDES: Flocculation would be a
8 primary treatment?

9 MR. VAN BONN: Sure.

10 MR. ANDES: I'm asking about a
11 secondary treatment.

12 MR. VAN BONN: I'd like to see that
13 other study if it's available.

14 MS. ALEXANDER: Sure.

15 MR. ANDES: As to this one, I'm --

16 MS. MEYERS-GLEN: If we want to
17 introduce that so you can see it --

18 MR. ANDES: Sure.

19 MS. MEYERS-GLEN: I would ask to
20 enter into evidence Development and Application of
21 Different Methods for the Detection of Toxoplasma
22 Gondii in Water.

23 MS. TIPSORD: If there's no
24 objection, we will mark Different Methods for the

1 Detection of Toxoplasma Gondii in Water by
2 Kourenti, et al, dated January 2003 from Applied
3 and Environmental Microbiology as Exhibit 246.

4 Seeing no objection, it's Exhibit 246.

5 (Document marked as Group
6 Exhibit No. 246 for
7 identification.)

8 MR. ANDES: If I can direct your
9 attention, a couple of statements look interesting
10 in this document and perhaps you can comment on.
11 One is on the bottom of 1649 and top of 1650.

12 MS. MEYERS-GLEN: I'm sorry. Which
13 document are you referring to?

14 MR. ANDES: I'm sorry. The Initial
15 Digestive Study, the Jessup paper.

16 MS. TIPSORD: Exhibit 245.

17 MR. VAN BONN: Say again the pages.

18 MR. ANDES: Bottom of 1649, top of
19 1650. It says in three small coastal communities
20 near Morro Bay, California, feral and free roaming
21 cats deposit an estimated 106.4 tons of feces per
22 year onto land that drain immediately into the
23 Pacific Ocean. And earlier it says introduced
24 invasive terrestrial mammals are the primary hosts

1 for these protozoa. Is there anything there about
2 treated waste water effluent?

3 MR. VAN BONN: Is there anything in
4 those statements that you just read me --

5 MR. ANDES: About the threat to
6 implicate treated waste water effluents?

7 MR. VAN BONN: In the statements
8 that you just read, no, they do not mention
9 treated waste water effluents.

10 MR. ANDES: When it then discusses
11 on 1650 the unusual mortality event in 2003 and it
12 says "blooms of toxic algae appear to have been an
13 important contributor to this event and then
14 nutrients, specifically nitrogen in the form of
15 urea may trigger these events," that's not
16 bacteria, right?

17 MR. VAN BONN: Urea is not a
18 bacteria, correct.

19 MR. ANDES: Thank you.

20 MS. MEYERS-GLEN: In following up,
21 does this article also list Morro Bay as being
22 part of the problem?

23 MR. VAN BONN: Yes.

24 MS. MEYERS-GLEN: And do you have

1 information as to issues concerning the Morro Bay
2 Waste Water Treatment Plant with regards to this
3 article?

4 MR. VAN BONN: Yes, I'm aware of a
5 waste water treatment plant at Morro Bay that is
6 one of the -- its a waste water treatment plant is
7 operating, as I understand it, under a waiver
8 currently that was granted by the EPA after
9 concurrence with the official wildlife service,
10 but as a condition of that permit, the waste water
11 treatment plant agreed to measures to minimize the
12 input of cat litter box waste into the municipal
13 water systems and accurately quantitated 2.2 tons
14 of cat litter or feces that entered that plant
15 directly on an annual basis. So I did that.

16 MR. ANDES: If I may ask a question
17 about that?

18 MS. MEYERS-GLEN: If I could just
19 follow up real quick about the article?

20 MR. ANDES: I'd like to follow up
21 first.

22 MS. MEYERS-GLEN: Sure.

23 MS. TIPSORD: Go ahead, Mr. Andes.

24 MR. ANDES: Thank you. That's a

1 301H waiver, a waiver from secondary treatment?

2 MR. VAN BONN: I'm not sure what the
3 waiver is.

4 MR. ANDES: Well, if that's a 301H
5 waiver from secondary treatment that means that
6 plant doesn't do the secondary treatment that the
7 Districts --

8 MS. MEYERS-GLEN: Objection. This
9 is testimony and not a question. He already said
10 he was unfamiliar with what a 301H waiver is.

11 MS. TIPSORD: Actually, his answer
12 was he didn't know what the waiver was. I don't
13 think you let Mr. Andes finish. I'm sure he's
14 going to ask the question.

15 MR. ANDES: Are you aware of whether
16 that plant does secondary treatment?

17 MR. VAN BONN: I'm not aware of the
18 level of treatment, no.

19 MR. ANDES: Would you like to follow
20 up?

21 MS. MEYERS-GLEN: Thank you. Within
22 the article, does it talk about in the Sea Otters
23 for a Dirty Ocean talk about the fact -- does it
24 talk about the practice of flushing cat litter

1 down the toilet as far as how waste water
2 treatment practices were not designed to destroy
3 the highly resistant oocysts of gondii and that
4 would be toxoplasmosis? The one I think I would
5 like to follow up with the Morro Bay treatment
6 plant in response to them finding 2.2 tons of cat
7 litter laden with cat feces in the effluent
8 streams, did the US EPA recommend taking any
9 measures to correct this?

10 MR. VAN BONN: I believe that's what
11 I stated in there in their -- in the issuing of
12 the permits were some conditions that included and
13 addressed the fact that cat feces were known to
14 enter that plant at a rate of 2.2 tons annually.

15 MR. ANDES: Can you tell us why the
16 EPA didn't require them to install secondary
17 treatment?

18 MR. VAN BONN: This is a temporary
19 waiver to my understanding and they --

20 MS. MEYERS-GLEN: Actually, we might
21 have it. At this time, since there seems to be --
22 I'm just going to enter this into evidence. We
23 have it so if --

24 MS. TIPSORD: I've been handed a US

1 EPA Region IX letter to Mr. Roger Briggs of the
2 California Regional Water Quality Control Board
3 from Alexis Strauss, Director, dated January 8th,
4 2008. We will mark this as Exhibit 247 if there's
5 no objection. Seeing none, it's Exhibit 247.

6 (Document marked as Group
7 Exhibit No. 247 for
8 identification.)

9 MS. MEYERS-GLEN: Isn't this a
10 temporary waiver until the waste water treatment
11 plant in question can actually bring online full
12 secondary treatment, isn't that correct, in 2014?
13 I refer to page four.

14 MR. VAN BONN: That's my
15 understanding.

16 MS. MEYERS-GLEN: And in the interim
17 what this waiver addresses is measures to try to
18 temporarily reduce the effects of the kitty litter
19 that's being flushed into the systems so as to
20 reduce the toxoplasmosis issue that's present in
21 that area?

22 MR. VAN BONN: The potential for
23 toxoplasmosis infection, yes.

24 MR. ANDES: Am I correct that based

1 on the statements on page two that this plant does
2 only partial secondary treatment and then blends
3 that effluent with primer effluent that doesn't
4 receive secondary treatment until 2014? The first
5 full paragraph on page two.

6 MR. VAN BONN: It looks like that is
7 correct.

8 MR. ANDES: So this is all blended
9 effluent situation with some waste water that
10 doesn't get secondary treatment. How do you
11 relate that, how do you analogize that to the
12 situation with the District's effluents that
13 receive full secondary treatment? What does this
14 tell you about the District's effluent?

15 MR. VAN BONN: That toxoplasmosis
16 can be present in the influx to the plant, to the
17 water treatment plant. That if not treated
18 appropriately, can be discharged as well.

19 MR. ANDES: Do you have any
20 information indicating that the District doesn't
21 treat it appropriately in its secondary treatment
22 facilities?

23 MR. VAN BONN: I can't speak to
24 that.

1 MR. ANDES: Thank you.

2 MS. MYERS-GLEN: If I may follow up?
3 What is the size of this Morro Bay plant?

4 MR. VAN BONN: In the discharge,
5 annual average is a million gallons per day, I
6 believe, for 2005, 2006.

7 MS. MYERS-GLEN: And how much
8 effluent does the MWRD three treatment plants, to
9 your knowledge, discharge daily into the CAWS?

10 MR. VAN BONN: To my knowledge, it's
11 over a billion gallons.

12 MR. ANDES: And do you have any
13 information as to levels of toxoplasmosis in that
14 billion gallons?

15 MR. VAN BONN: No.

16 MR. ANDES: Thank you.

17 MS. MYERS-GLEN: To your knowledge,
18 did the risk assessment look at toxoplasmosis?

19 MR. VAN BONN: I think a risk
20 assessment should look at all recognizable risks
21 to the health of the animals in the area.

22 MS. MYERS-GLEN: And when you looked
23 at the MWRD risk assessment, did you see any
24 indication that they had looked at toxoplasmosis

1 as one of the pathogens in the CAWS?

2 MR. VAN BONN: Yes, I believe there
3 was data on toxoplasmosis and giardiasis included
4 in the report.

5 MS. MYERS-GLEN: And that was within
6 their effluent?

7 MR. VAN BONN: I don't know where it
8 was.

9 MS. MYERS-GLEN: Okay.

10 MR. ANDES: Can we move on?

11 MS. TIPSORD: Yes.

12 MR. ANDES: Thank you. On question
13 number 13, several cases are cited of otters in
14 captivity or zoos having bacteria associated with
15 problems. Is it correct that the sorts of
16 bacteria in those cases were not waste water
17 treatment effluents?

18 MR. VAN BONN: The source of the
19 bacteria in those cases wasn't always stated or
20 known, but exposing otters in a managed collection
21 to an undisinfected waste water treatment plant
22 would be against the best practices. In fact, the
23 Animal Welfare Act dictates from marine animals
24 and water quality standards that we must adhere to

1 in order to maintain acceptable water quality,
2 microbial water quality and the limit that is set
3 by that act is one thousand total coliforms per
4 one hundred mills. So any time we see a number
5 that approaches that, we will take action.

6 MR. ANDES: Thank you.

7 MS. MEYERS-GLEN: And can you please
8 describe the difference between one thousand total
9 coliforms and one thousand fecal coliforms units?

10 MR. VAN BONN: As I understand it,
11 fecal coliforms -- I'm not a microbiologist, but
12 fecal coliforms are a subset of the coliforms in
13 the water column. As a clinician, practically the
14 numbers that we see -- the total coliforms tend to
15 be as a general rule higher than the fecal
16 coliforms.

17 MS. MEYERS-GLEN: And you had
18 mentioned that you would take action. Are you
19 required to take action if the total coliform
20 limit is above one thousand?

21 MR. VAN BONN: Yes. If it's above
22 one thousand, we're required by law to take
23 action.

24 MR. ANDES: What's the level of the

1 water quality requirement being proposed here?

2 MR. VAN BONN: I'm sorry?

3 MR. ANDES: What's the level of the
4 effluent requirement being proposed here?

5 MR. VAN BONN: I don't think it's
6 total coliform counts. That is the metric.

7 MR. ANDES: Fecal coliform, but it's
8 not a thousand, right?

9 MR. VAN BONN: Different numbers.

10 MR. ANDES: Okay. And they're
11 really different situations, aren't they?

12 MR. VAN BONN: They're bacteria in
13 the water that are accounted and the total
14 coliforms, we have a limit, a thousand per hundred
15 mill. We do not have a limit specifically for
16 fecal coliforms.

17 MS. MYERS-GLEN: Would fecal
18 coliform be a subset of total coliform?

19 MR. VAN BONN: That's my
20 understanding, yes.

21 MR. ANDES: If I can move to
22 question 17? You cite a reference relevant to
23 microbial source tracking and I'll introduce that
24 to our article at this point. The name of the

1 paper is Determining Sources of Fecal Bacteria in
2 the Waterways.

3 MS. TIPSORD: If there's no
4 objection, I will mark Determining Sources of
5 Fecal Bacteria in Waterways by Tao Yan and Michael
6 J. Sadowsky, dated July 2005 as Exhibit 248.
7 Seeing no objection, it's Exhibit 248.

8 (Document marked as Group
9 Exhibit No. 248 for
10 identification.)

11 MR. ANDES: Dr. Van Bonn, in the
12 abstract of this report does it state the
13 measurement of fecal indicator bacteria does not
14 define the pathogens or define the pathogens or
15 presence or define the sources of these bacteria?

16 MR. VAN BONN: It says fecal
17 indicator bacteria have been used successfully as
18 the primary tool for microbiologically based risk
19 assessment.

20 MR. ANDES: Yes.

21 MR. VAN BONN: However, measurement
22 of fecal indicator bacteria does not define what
23 pathogens are present or define the sources of
24 these bacteria.

1 MR. ANDES: Thank you. That's all
2 the questions I have.

3 MS. MYERS-GLEN: Actually, if I
4 could follow up with that. Why did you refer to
5 this article?

6 MR. ANDES: I'm sorry?

7 MS. MYERS-GLEN: The article by Yan
8 that you just had him read from. Why did you
9 include this when you referred to it?

10 MR. VAN BONN: I referred to this
11 article as an example of the difficulty of tracing
12 back individual specific microbes to source.
13 Because the system is so complex and the inputs
14 are so complex that it can be very difficult to
15 identify and a lot of attention is focused on it
16 because it's important. It doesn't negate the
17 statement that there are certainly pathogens in
18 undisinfected effluents.

19 MR. ANDES: Dr. Van Bonn, that
20 statement is providing as a broader viewpoint
21 after you've made a statement that since cat feces
22 and discarded litter have been found to
23 contaminate waste, the effluent discharge by
24 MWRD's three plants could also pose a risk of

1 toxoplasmosis to resident river otters in the CAWS
2 and lower Des Plaines River.

3 We've just gone through the
4 statements concerning the cat feces and
5 toxoplasmosis and I haven't heard a basis for any
6 actual finding that there's toxoplasmosis present
7 in the treated effluents from the District that
8 poses a risk other than your general statement
9 about cat feces in Morro Bay, California. So tell
10 me what and end with this statement at the end --
11 I'm trying to understand when the paper
12 specifically says that fecal coliform doesn't tell
13 you what the sources are or what pathogens are
14 present, what the basis is for any statement you
15 made that there's actually an increased risk here
16 from the pathogens from the District's treatment
17 plants, that disinfection would significantly
18 reduce?

19 MS. MEYERS-GLEN: I would object to
20 the first part of the characterization, the link
21 between toxoplasmosis and potentially being found
22 in effluents from MWRD's treatment plants. As far
23 as the initial statement made by Andes, I would
24 object to that. As far as the question, if you'd

1 like to answer.

2 MR. VAN BONN: I think there were at
3 least two questions there or maybe I didn't catch
4 it all. Can you ask the question again?

5 MR. ANDES: I'm not sure I can. I
6 was quoting from your statement.

7 MR. VAN BONN: Tell me what it was
8 then.

9 MR. ANDES: Perhaps we can simply
10 go -- it sounds -- tell me.

11 MR. VAN BONN: Tell me -- you did
12 quote from it. Tell me where it was again.

13 MR. ANDES: That was on the next to
14 last page. We're talking about cat feces and
15 toxoplasmosis. We've addressed that issue and
16 then you say for a broader viewpoint, you cite
17 this study. I'm trying to understand what does
18 that study add regarding --

19 MR. VAN BONN: I think I can clarify
20 this for you. What I say in the testimony is that
21 cat feces and discarded litter has been found to
22 contaminate waste water.

23 MR. ANDES: No information about the
24 District's waste water, right?

1 MR. VAN BONN: The effluent
2 discharged by the MWRD's three plants could also
3 pose a risk of toxoplasmosis to river otters in
4 the CAWS. It could. Cat feces can enter a waste
5 water treatment plant. Cat feces could
6 potentially be -- the effluent could be a source.
7 And, again, otters are one example. Toxoplasmosis
8 is one example. There's a myriad of things in raw
9 sewage, in treated sewage, in undisinfected
10 sewage.

11 MR. ANDES: Let me stop you there.
12 That's the particular example that you cite, but
13 yet what I was asking was is there any information
14 indicating that while cat feces may come into the
15 system, is there any information you have
16 indicating that the District doesn't adequately
17 treat for that in its secondary treatment systems
18 which are not the same as what was present in
19 Morro Bay?

20 MR. VAN BONN: I don't know either
21 way. I don't know either -- I don't know whether
22 it's appropriate or inappropriate for
23 toxoplasmosis specifically.

24 MR. ANDES: Thank you.

1 MS. MYERS-GLEN: And you had
2 mentioned that toxoplasmosis is only one of the
3 pathogens of potential concern for wildlife such
4 as river otters in the CAWS. If I may refer you
5 to page six of your testimony? You quoted a
6 veterinary article from 2004 stating that "to
7 date, giardia of human origin appears to be the
8 main source of water contamination and as such may
9 impact negatively on ecosystems health leading to
10 infections in aquatic wildlife." And did this
11 article, did that also include sea otters?

12 MR. VAN BONN: Yes.

13 MS. MEYERS-GLEN: And would this
14 potentially also be applicable to river otters?

15 MR. VAN BONN: Yes, they're both
16 susceptible.

17 MS. MYERS-GLEN: And as a health
18 care specialist, especially in your current
19 position with Shedd, would you risk this form of
20 giardia to river otters at Shedd?

21 MR. VAN BONN: Not knowingly.

22 MR. ANDES: And did you look in the
23 risk assessment report at the levels of giardia
24 detected or not detected in the CAWS?

1 MR. VAN BONN: I'm not sure I
2 reviewed that part, but if it's in the report --

3 MR. ANDES: It is.

4 MS. MEYERS-GLEN: Did you determine
5 whether or not giardia was, in fact, a pathogen
6 within MWRD --

7 MR. VAN BONN: I believe it's listed
8 as a risk in that report.

9 MR. ANDES: Listed as a risk -- I'm
10 sorry. What does that mean? Listed as detected
11 in ambient samples or you're not familiar, you're
12 just not familiar enough with the data to say?

13 MR. VAN BONN: Correct.

14 MR. ANDES: Thank you.

15 MS. TIPSORD: Actually, I think
16 we're about ready to wrap up. Is there anything
17 else?

18 MR. ANDES: No.

19 MS. WILLIAMS: I have a little
20 follow up.

21 MS. TIPSORD: You know what, I have
22 to give the court reporter a couple of minutes to
23 make a phone call. We'll take a break.

24

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

4 MS. TIPSORD: Ms. Williams, you had
5 a few questions.

6 MR. WILLIAMS: Dr. Van Bonn, on page
7 three of your testimony it has a heading that ends
8 with the otter as an example. Are there any other
9 aquatic mammals that are present in the CAWS to
10 your knowledge? I'm just getting that you said
11 the otter was an example. Are there other aquatic
12 mammals in the CAWS waters that you know?

13 MR. VAN BONN: That have been
14 documented in the CAWS itself?

15 MR. WILLIAMS: Correct.

16 MR. VAN BONN: I don't know of any
17 other surveys in the CAWS specifically. I don't
18 know of any surveys.

19 MS. MYERS-GLEN: Do you know
20 personally though of any mammals that -- are there
21 beavers in the CAWS?

22 MR. VAN BONN: I know that there are
23 beavers geographically in this area, whether they
24 fall within the waterways of the CAWS or not, I

1 don't know.

2 MR. WILLIAMS: And just out of
3 curiosity, what temperature do you keep the water
4 at in the aquarium where the river otters are
5 kept?

6 MR. VAN BONN: I can't tell you the
7 exact number off the top of my head. We have
8 hundreds of systems and hundreds of exhibits.

9 MR. WILLIAMS: Is it ever allowed to
10 get up to a hundred degrees?

11 MR. VAN BONN: No. I can say that
12 for sure.

13 MS. MYERS-GLEN: If I can follow up
14 briefly on that? We had touched on the fact
15 earlier that Dick Lanyon had testified that MWRD
16 effluent that's discharged into the CAWS can have
17 upwards of 200,000 fecal coliforms units per
18 hundred milliliters, is that correct?

19 MR. ANDES: Are we characterizing
20 Mr. Lanyon's testimony.

21 MS. MYERS-GLEN: I believe that's
22 what we had testified to before, but if you like,
23 we can go back to the original transcript as far
24 as characterizing that exactly as the way that

1 Mr. Lanyon said it.

2 MR. ANDES: Go ahead. We'll see if
3 we need to.

4 MS. MYERS-GLEN: Okay. Do you
5 recall that testimony?

6 MR. VAN BONN: I recall testimony by
7 Mr. Lanyon about the numbers of fecal coliforms
8 and the similarity to effluents.

9 MS. MYERS-GLEN: And do you recall
10 the number of 200,000 fecal coliform units being
11 used to characterize MWRD?

12 MR. VAN BONN: I remember that
13 number as one of the numbers he cites.

14 MS. MYERS-GLEN: And if at Shedd the
15 water in which the river otters or the sea otters
16 reside had a fecal coliform count of 200,000 per
17 one hundred milliliters, what would your response
18 be?

19 MR. VAN BONN: We would definitely
20 take action immediately to figure out why that
21 number was reported. That's much, much higher
22 than any numbers we normally see in any of the
23 systems. So we would probably remove the animals
24 immediately from the water and investigate how we

1 got a number like that.

2 MS. MYERS-GLEN: Would this number
3 concern you?

4 MR. VAN BONN: Yes.

5 MS. MYERS-GLEN: Why?

6 MR. VAN BONN: Because it would
7 suggest that there's been an influx of fecal
8 bacteria into the water that the animal is living
9 in.

10 MS. MYERS-GLEN: And why would that
11 concern you?

12 MR. VAN BONN: Because that also
13 suggests that there would be an influx of
14 additional microbes along with the fecal coliforms
15 that could potentially cause illness in the
16 animal.

17 MS. MEYERS-GLEN: And, for example,
18 what kinds of illnesses would you be concerned
19 about with fecal coliform counts like that?

20 MR. VAN BONN: There could be any
21 number of illnesses, but antritis, gastritis,
22 pneumonias. There's a number of them. A lot of
23 different potential --

24 MS. MYERS-GLEN: Would giardia and

1 cryptosporidium be among those?

2 MR. VAN BONN: Yes.

3 MR. ANDES: Dr. Van Bonn, have you
4 looked in the risk assessment report at data in
5 the ambient -- in the -- at various monitoring
6 stations in the CAWS for bacteria?

7 MR. VAN BONN: I've seen the numbers
8 reported in those tables. Wherever they were
9 collected, I'm not --

10 MR. ANDES: And those are in
11 situations where the District is not disinfecting,
12 right?

13 MR. VAN BONN: I'm not sure of where
14 the one that's labeled outfall comes from and at
15 what point. There's a discussion about the total
16 flow contribution to the CAWS from the treatment
17 plants.

18 MR. ANDES: Have you assessed
19 whether the pathogen levels in the waters cause
20 any adverse impact to river otters in the CAWS?

21 MR. VAN BONN: I am not aware of any
22 health assessment specifically focused on river
23 otters in the CAWS.

24 MS. MEYERS-GLEN: Does that --

1 MR. ANDES: Reasonably --

2 MS. MEYERS-GLEN: If I may have a
3 quick follow up to that. Does that alleviate any
4 concerns that there may still be a risk to river
5 otters by effluent coming out of MWRD's treatment
6 plants?

7 MR. VAN BONN: No.

8 MS. MYERS-GLEN: Why?

9 MR. VAN BONN: Undisinfected
10 effluent is going to contain potentially
11 pathogenic microbes, bacteria, fungi, viruses,
12 protozoa, metazoa, parasites, that can potentially
13 infect a number of animals, including otters.

14 MR. ANDES: And those same
15 bacterial -- that same bacterial presence, they
16 are also from other sources, including wildlife
17 sources in the CAWS, correct?

18 MR. VAN BONN: There are many inputs
19 into a system. Disinfected effluents will be one
20 source.

21 MR. ANDES: And you have not
22 assessed, am I right, the degree to which
23 disinfection will reduce the levels?

24 MR. VAN BONN: Disinfection by

1 definition would reduce the number of pathogens in
2 the effluent. Any disinfection would cause some
3 reduction.

4 MR. ANDES: Have you looked at the
5 report by Blatchley in terms of repair and
6 regrowth of bacteria after disinfection?

7 MR. VAN BONN: I think you referred
8 to it in one of the questions that we didn't get
9 to.

10 MR. ANDES: Have you looked at that
11 report?

12 MR. VAN BONN: Are we going to go
13 back to that question?

14 MR. ANDES: Sure.

15 MS. MYERS-GLEN: What question are
16 you on?

17 MR. ANDES: I don't know. I put it
18 away. I'm really following up on the questions
19 asked just now.

20 MR. VAN BONN: Effective
21 disinfection will reduce the risk.

22 MR. ANDES: And you haven't assessed
23 how much?

24 MR. VAN BONN: No, I'm not assessing

1 the magnitude.

2 MR. ANDES: Thank you.

3 MS. TIPSORD: Is there anything else
4 for Dr. Van Bonn? All right. Thank you very
5 much, Dr. Van Bonn. It's been a pleasure.

6 MR. VAN BONN: It has.

7 MS. TIPSORD: We will then adjourn
8 and go -- we'll start again on May 5th and our
9 witnesses that day will be Marilyn Yates and
10 possibly Margaret Frisbie and Thomas Bamonte.
11 Thank you very much. We'll see you all on the
12 5th.

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1 STATE OF ILLINOIS.)
2) SS.
3 COUNTY OF COOK)
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6 I, Steven Brickey, Certified Shorthand
7 Reporter, do hereby certify that I reported in
8 shorthand the proceedings had at the trial
9 aforesaid, and that the foregoing is a true,
10 complete and correct transcript of the proceedings
11 of said trial as appears from my stenographic
12 notes so taken and transcribed under my personal
13 direction.

14 Witness my official signature in and for
15 Cook County, Illinois, on this 27th day of
16 April, A.D., 2009.

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