

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

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

NOTICE OF FILING

To:

John Therriault, Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph St., Suite 11-500
Chicago, IL 60601

Marie Tipsord, Hearing Officer
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph St, Suite 11-500
Chicago, IL 60601

Persons included on the attached
SERVICE LIST

PLEASE TAKE NOTICE that the Environmental Law and Policy Center has today filed **Prefiled Questions to Ray Henry, James Huff, Adrienne Nemura, Scudder Mackey, Jennifer Wasik, David Zenz, and Scott Bell** in R2008-09, Subdocket C, a copy of which is hereby served upon you.

Respectfully Submitted,



Albert Ettinger
Counsel for Environmental Groups
53 W. Jackson Blvd., Suite 1664
Chicago, IL 60604

DATED: February 23, 2011

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**PRE-FILED QUESTIONS OF
PRAIRIE RIVERS NETWORK AND SIERRA CLUB TO
RAY E. HENRY**

The Illinois Chapter of the Sierra Club and Prairie Rivers Network hereby file questions to Ray E. Henry:

1. You were asked to estimate the costs of addressing heat at the Fisk, Crawford, Will County and Joliet power plants. Were you asked by Midwest Generation (MWG) to look at the costs of reducing impingement at any of the plants? Would moving to a closed cycle system reduce impingement?
2. You state at page 1 of your testimony that S&L conducted at least 15 studies for addition of cooling towers over the last 30 years. What other plants were studied? What was concluded by each study? Have any cooling towers been added as a result of a S&L study.
3. At page 3 of your testimony you state that it is your understanding that the proposed temperature standard for the Lower Des Plaines are in some respects more stringent than the present General Use standards. Did you consider that requirement of the current standards that temperatures not be raised more than 5 degrees above natural temperatures? Did you consider the standard requiring that normal daily and seasonal fluctuations be maintained? See 35 Ill. Adm. Code 302.211 (c) and (d).
4. What is the basis for your statement on page 6 that the Fisk, Crawford, Will County and Joliet power plants all lack land necessary for ponds or sprays? Could ponds or wetlands be put near any of the plants that would reduce the extent to which cooling towers were needed? Did you restrict your search to land already owned by MWG?
5. Please explain your first sentence in the last full paragraph of page 9 regarding retrofitting plants with once through cooling.
6. Why do you believe (p. 10) that adding cooling might trigger new source review? Does MWG believe that adding cooling to its Joliet plant triggered NSR?
7. Have you considered how putting cooling towers at upstream plants might affect the extent of the need for cooling at downstream plants?
8. Could cooling towers be combined with wetlands that would serve to treat water for nitrogen?

9. How much did it cost MWG to buy the plants?
10. If Fisk and Crawford were to close, would that affect intake temperatures at Will County?
11. You estimate that annual loss in revenue at all five stations would be approximately \$3,800,000 (p. 16) and that the estimated O&M costs would be over \$23,000,000 (p. 18). What is the current revenue being made at the five stations?

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**PRE-FILED QUESTIONS OF
PRAIRIE RIVERS NETWORK AND SIERRA CLUB TO
JAMES E. HUFF P.E.**

The Illinois Chapter of the Sierra Club and Prairie Rivers Network hereby file questions to James E. Huff P.E.:

1. What is the basis for your statement on page 3 of your pre-filed testimony that “no net increase in sulfates is allowed when the receiving stream exceed 500 mg/L chlorides/”?
2. Also on page 3, you refer to the Agency proposed “upgraded use” of the Lower Ship Canal. How is the Agency proposal an “upgrade?”
3. On page 4 you state that the “Lower Ship Canal is typically 200 to 300 feet wide.” Why does this matter?
4. Also on page 4, you mention that the Lower Ship Canal has “depths greater than 27 feet.” Is it all over 27 feet deep? How is it important that it has depths of greater than 27 feet?
5. What do you mean on page 5 of your pre-filed testimony that “overall stream use is designated as non-support[?]” Does the Lower Ship Canal violate existing standards for PCBs, iron, oil and grease, dissolved oxygen, total nitrogen, and total phosphorus? Is Citgo contributing to any of these violations through its operations?
6. On page 5 you mention “rotenone applications.” What information do you have about any future applications of rotenone.
7. On page 6 of your testimony, you mention fish migrating up and down the system. Have you studied fish migration in the system? Do fish currently migrate into the Lower Ship Canal? Where from?
8. How in your view does section 302.102(b)(9) prohibit mixing zones for constituents where the water quality standards is already violated?
9. Have you determined how many violations there would be of the chloride standard if Illinois adopted the federal criteria for chloride or the recently EPA-approved Iowa criteria?
10. On page 8 you state that “on an effluent dominated stream, chlorinating the incoming water is important to prevent biological growth on the heat exchangers.” Why is this?
11. You state on page 8 that a 50 % reduction of salt use during the heaviest storm events would be required to achieve a 500 mg/L chloride standard. How do you calculate that?

12. In footnote 1 of page 8 of your testimony you state that the Agency seeks to impose more restrictive water quality standards on secondary contact waters than general use waters with regard to temperature and arsenic. Please explain why you believe this as to temperature. Did you take into account 35 Ill. Adm Code 302.211(c) or (d).
13. Regarding the proposed Standard in Exhibit B, do you believe that all the explanatory language is necessary or appropriate in a water quality standard?

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**PRE-FILED QUESTIONS OF
PRAIRIE RIVERS NETWORK AND SIERRA CLUB TO
ADRIENNE D. NEMURA**

The Illinois Chapter of the Sierra Club and Prairie Rivers Network hereby file questions to Adrienne D. Nemura regarding the proposed wet weather limited use designation and the proposed MWRD standards and criteria which are necessary to meet the proposed aquatic life use designations:

**QUESTIONS REGARDING THE PROPOSED WET WEATHER LIMITED USE
DESIGNATION (SUBDOCKET C):**

1. In what other places have there been wet weather use designations regarding aquatic life uses?
2. To your knowledge, has U.S. EPA ever approved a wet weather use designation for aquatic life uses? If so, please describe.
3. On page 2 of your testimony, you state that it is not possible to eliminate or fully treat these wet weather sources in the foreseeable future. Is it possible eliminate or treat them partially?
4. Are their benefits to eliminating or treating CSOs in addition to reducing the effect of CSOs on dissolved oxygen levels?
5. How do you believe that the construction of the Deep Tunnel system (TARP) should bear on this issue?
6. What is your understanding of when the TARP will be completed?
7. Will this proposal be equally necessary after such time as TARP is completed?
8. Do you believe that MWRD will complete the TARP if all regulatory requirements that it do so are eliminated?
9. On page 3 of your testimony, you refer to a "finding" by the District that the DO criteria now applicable to the CAWS cannot be met through advanced wastewater treatment at the MWRD's three major plants or by the capture and treatment of CSOs. Further, you cite a document, MWRD Report 09-50. Where is this finding contained in the cited document? Is the finding contained in some other document?
10. Have you seen data that is adequate to see daily changes in DO levels at the locations? Are there any areas within the cause which show diurnal patterns of DO levels due to the

effects of photosynthesis? If so, please describe them? If there are no sites showing such effects of photosynthesis, do you know why not?

11. Do you disagree with Mr. Zenz's testimony regarding the possibility of meeting DO standards through use of aeration equipment?
12. Why is it "appropriate to establish a [wet weather designation] based on the existing system" (p. 4) if the TARP is going to lessen or eliminate any of the CSOs.
13. Is the study in the record in which it is purportedly shown that even with elimination of CSOs wet weather conditions would continue to adversely impact dissolved oxygen conditions? How severe would the DO problem be if all CSOs were eliminated? Would all portions of the CAWS continue to have DO problems if CSOs were eliminated? Could the limited problems that continue to exist after CSOs were eliminated be addressed with treatment of the CSOs or aeration?

QUESTIONS REGARDING THE PROPOSED STANDARDS AND CRITERIA WHICH ARE NECESSARY TO MEET THE MWRD'S PROPOSED AQUATIC LIFE USE DESIGNATIONS:

1. Has any state approved criteria that allow DO levels to fall below 1.5 mg/L?
2. Has U.S. EPA ever approved a state standard that allowed DO levels to fall below 1.5mg/L?
3. Do fish kills sometimes go unreported?
4. Are there forms of aquatic life that cannot swim away from low oxygen conditions that could be harmed by days of DO levels below 2 mg/L?
5. Have you reviewed any studies that consider the effect of low DO conditions on native mussels or other species that might live in the CAWS?
6. On page 5 of your testimony you state that the "WWLU would not be applied during a wet weather event when dissolved oxygen levels were greater than or equal to the dissolved oxygen criterion." What does this mean and what, if any, practical consequences does it have on how protective or unprotective the proposed criterion is?
7. On page 13 of your proposal it is stated that under the District's proposal, one location will received additional treatment. Why?

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**PRE-FILED QUESTIONS OF
PRAIRIE RIVERS NETWORK AND SIERRA CLUB TO
SCUDDER D. MACKEY**

The Illinois Chapter of the Sierra Club and Prairie Rivers Network hereby file questions to Scudder D. Mackey:

1. To your knowledge, has the type of study done by LimnoTech to assess habitat conditions in the CAWS been done in any other water body? If so, where? Has such a report ever concluded that water quality was more important in the water body studied than habitat conditions?
2. Has a habitat index specifically designed for a particular water of body been done for other water bodies? Is it possible to use such a study to compare bodies of water? If there was a water quality condition effecting essentially the entire water body subject to such a specific study, would it be possible to conclude from that specifically designed study that the water quality condition was significant?
3. Did the Limnotech study look at any water quality parameters other than DO and temperature?
4. Are there forms of aquatic life that can be affected by low DO levels other than fish?
5. Are some species of juvenile fish more sensitive to low DO levels than adult fish of the species?
6. Regarding your testimony at p. 4, are all the species of fish present in the Midwest already found in the CAWS other than intolerant or moderately intolerant obligate riffle dwellers that require fast moving water and coarse substrates.
7. What factors affect the levels of macrophyte cover in a water body?
8. At page 5 of your testimony, you state that only 3% of the fish data that is not explained by the six physical habitat variables in the regression. If we broke down the six physical factors and asked how much of the variation was explained by that factor alone, what would be the answer for each of the six factors?
9. What do you mean by a “relatively complete fish community” as stated at page 6 of your pre-filed testimony?
10. On page 9 of your testimony, you state that “electrofishing samples a relatively small volume of water (estimated 1 to 2 million cubic feet) over a short period of time (hours).”

- What are the implications of this fact? Does electrofishing uniformly catch all age classes of fish? Does electrofishing catch fish equally at various depth levels in the water body?
11. You mention on page 11, that many of the catfish found in the CSSC could have been from spawning in the Lower Des Plaines River. Could catfish spawn in other waters that are physically connected to portions of the CAWS?
 12. Do you believe that fish from the Great Lakes occasionally enter portions of the CAWS? If so, how was this addressed in the Limnotech study? Do you believe that it should have been factored into the study in some way?
 13. Is electrofishing often done during circumstances in which there are effects from CSOs?
 14. Are you one of the authors of a report done for the Great Lakes Fishery Commission entitled Preliminary Feasibility of Ecological Separation of the Mississippi River and the Great Lakes to prevent the Transfer of Aquatic Invasive Species (November 2008)?
 15. Do you agree that one of the probable causes of the aquatic life use impairment in the CAWS characterized by the fish community is “periodic discharges from combined sewers causing a decrease in the dissolved oxygen concentration.” (p. 48)

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**PRE-FILED QUESTIONS OF
PRAIRIE RIVERS NETWORK AND SIERRA CLUB TO
JENNIFER WASIK**

The Illinois Chapter of the Sierra Club and Prairie Rivers Network hereby file questions to Jennifer Wasik:

**QUESTIONS REGARDING THE PROPOSED WET WEATHER LIMITED USE
DESIGNATION (SUBDOCKET C):**

1. What is meant in footnote 1 of your testimony that the MWRD's proposal is subject to approval by the District's Board of Commissioners?
2. On page 7 of your testimony you state that the Chicago River "demonstrates no potential for habitat improvement due to the 97% vertical wall armored banks and lack of overhanging vegetation and bank pocket areas." Do you believe that the vertical walls are completely solid?
3. Is there nowhere within the distance from which fish could swim to the Chicago River where habitat could be constructed?
4. On page 9 of your testimony you discuss Bubbly Creek, the Collateral Channel and other off-channel slip. Are you aware of proposals that were developed to establish prairies, and shallow aquatic areas in Bubbly Creek, the Collateral Channel and South Branch slips by the Wetlands Initiative in connection with development of mitigation sites for O'Hare airport expansion? Did you, or to your knowledge, anyone else employed by the MWRD make Limnotech aware of these proposals for use in making its habitat improvement study?
5. On page 12 of your testimony you state that "testimony provided by the District based on continuous monitoring data throughout the system has shown that diurnal DO fluctuation rarely occurs in these deep draft waters." What testimony? What deep draft waters? Is the entire CAWS "deep draft?" Are there areas within the CAWS that have diurnal swings? Why do diurnal swings rarely occur in much of the CAWS?
6. Are you aware of any MWRD report from which one can actually see hourly DO data from the continuous DO monitoring done in the CAWS?

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7. On page 14 of your testimony you state that fish kills do not occur except under “extremely rare circumstances.” Do some fish kills currently go unobserved? Is it the intent of the MWRD proposal to allow it to create circumstances that will make legal the rare fish kills that do occur?
8. In what other places have there been wet weather use designations regarding aquatic life uses?
9. To your knowledge, has U.S. EPA ever approved a wet weather use designation for aquatic life uses? If so, please describe.
10. On page 18 of your testimony, you state that it is “not feasible to eliminate or capture the wet weather sources in the foreseeable future.” What do you mean by this? Is not the TARP supposed to do this to a substantial extent? Does your statement ignore TARP, assume the TARP will not be completed in the foreseeable future, or is your testimony and proposal restriction to those wet weather sources that will not be eliminated by the completed TARP system? If it is not possible eliminate these sources, is it possible to reduce or treat them partially?
11. Has MWRD ever studied the potential effect on reducing wet weather sources of green technology or the effect of implementing a strong storm water control ordinance?
12. Are their benefits to eliminating or treating CSOs in addition to reducing the effect of CSOs on dissolved oxygen levels?
13. How do you believe that the construction of the Deep Tunnel system (TARP) should bear on this issue?
14. What is your understanding of when the TARP will be completed?
15. Will this proposal be equally necessary after such time as TARP is completed?
16. Do you believe that MWRD will complete the TARP if all regulatory requirements that it do so are eliminated?
17. What plans does MWRD have to address CSOs if it is freed from all legal responsibility to do so?
18. Do you disagree with Mr Zenz’s testimony regarding the possibility of meeting DO standards through use of aeration equipment?
19. Does the MWRD know how severe would the DO problem be if all SSOs and CSOs were eliminated? Would all portions of the CAWS continue to have DO problems if SSOs and CSOs were eliminated? Could the limited problems that continue to exist after SSOs and CSOs were eliminated be addressed with treatment of the CSOs or aeration?

QUESTIONS REGARDING THE PROPOSED STANDARDS AND CRITERIA WHICH ARE NECESSARY TO MEET THE MWRD’S PROPOSED AQUATIC LIFE USE DESIGNATIONS:

1. Has MWRD developed proposed language for the standards and criteria that it believes should be adopted?
2. What is the scientific basis for the proposed cyanide criteria and has it been placed into the record of this proceeding?
3. Has MWRD done any independent scientific work regarding criteria or is it just working by eliminating species that do not currently exist in the CAWS from the federal criteria document?

4. What are the sources of cyanide in the CAWS? How much would it cause MWRD to lessen the amount of cyanide in the CAWS?
5. Are you aware of studies showing affects of cyanide in low concentrations on bluegill reproduction? Are there any studies of the effects of cyanide on invertebrates or mussels?
6. Has any state approved criteria that allow DO levels to fall below 1.0 mg/L?
7. Why should DO levels be allowed to fall in the entire CAWS below the 2.0 mg/L minimum specified for the Milwaukee River?
8. Has U.S. EPA ever approved a state standard that allowed DO levels to fall below 1.5mg/L.
9. Are there forms of aquatic life that cannot swim away from low oxygen conditions that could be harmed by days of DO levels below 2 mg/L?
10. Did MWRD consider establishing a 7 day mean of minimum criteria for areas of the CAWS that might be exposed to continuous or regularly occurring exposures to dissolved oxygen concentrations at or below the lethal threshold?
11. Have you reviewed any studies that consider the effect of low DO conditions on native mussels or other species that might live in the CAWS? Do low DO conditions affect macroinvertebrates or macrophytes? Has the MWRD ever studied the potential for increased native mussel populations if the low DO events were lessened?
12. Have you or anyone else to your knowledge discussed the proposed wet weather criteria with U.S. EPA? If so, what did they say?

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**PRE-FILED QUESTIONS OF
PRAIRIE RIVERS NETWORK AND SIERRA CLUB TO
DAVID R. ZENZ REGARDING TO MEET PROPOSED IEPA CRITERIA**

The Illinois Chapter of the Sierra Club and Prairie Rivers Network hereby file questions to David R. Zenz:

1. Have you or to your knowledge anyone else working for MWRD ever calculated what it would cost MWRD to meet the existing dissolved oxygen standards for the secondary contact waters in the CAWS?
2. Would it be possible for you or someone else to break out the costs of meeting the proposed or existing dissolved oxygen standards for sections of the CAWS? For example, could you determine the costs of meeting the existing standards for the North Branch or the Cal Sag?
3. What will the proposed supplemental aeration stations look like? Will they provide any benefits in addition to raising DO levels?
4. Have you ever been involved in any efforts to develop approaches to low DO levels caused by combined sewer overflows other than overflows to the CAWS? If so, what approaches were considered in those cases? What was implemented?
5. Are you aware of any other possible approaches to the problem of low DO levels caused by CSOs other than supplemental aeration stations?
6. Did you or to your knowledge anyone else working for MWRD ever consider approaches to the problem of low DO levels caused by CSOs other than supplemental aeration stations?
7. Did you or to your knowledge anyone else working for MWRD ever consider fixing some of the CSOs as an approach to this problem?
8. Are there problems caused by CSOs in addition to their effect on dissolved oxygen levels?
9. Have you considered providing wastewater treatment for the CSOs? If so, why was this option rejected?
10. Did you personally work on a study of the costs of treating CSOs?
11. Did you present "Development of a Framework for an Integrated Water Quality Strategy for the Chicago Area Waterway" in May 2007?

12. Are you familiar with a study done for the MWRD entitled Evaluation of Cost and Benefits of CSO treatment that was presented in July 2006?
13. Are you familiar with MWRD-supported efforts to develop treatment wetlands for CSO or nutrient pollution?
14. What is a “ceramic disc diffuser”?
15. Do you always assume in costing projects, as you do on the third page of your testimony, that the interest rate is equal to the inflation rate in making cost estimates? Do you believe that the long term real interest rate is zero? Have you ever done a cost estimate for a federal agency?
16. Why are two aeration stations needed to meet the MWRD’s proposal?
17. What is meant by the sentence in your testimony (below table 6) that under the MWRD proposal “the wet-weather provision would not be applied during wet weather even when DO levels were greater than or equal to the minimum DO criteria[?]”
18. Have you ever worked on another project that involved a wet weather water quality standard? Have you ever worked on one involving a standard designed to protect aquatic life?
19. Have you ever heard of a wet weather standard being proposed before this MWRD proposal that allowed deviation from normally applied standards designed to protect aquatic life during wet weather? Are you aware of any basis for believing that U.S. EPA would approve such a wet weather standard?
20. Are there standards that sometimes are violated as a result of CSOs in addition to DO? If so, to your knowledge, does MWRD intend to propose wet weather criteria that would allow it to operate CSOs that would allow violation of those standards?
21. Does MWRD seek to avoid all responsibility for the effects of the CSOs it operates?

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**PRE-FILED QUESTIONS OF
PRAIRIE RIVERS NETWORK AND SIERRA CLUB TO
SCOTT B. BELL**

The Illinois Chapter of the Sierra Club and Prairie Rivers Network hereby file questions to Scott B. Bell:

REGARDING THE HABITAT EVALUATION REPORT:

1. Have you ever been involved in an evaluation like this one before? If so, please describe such evaluations and what they determined? Did they all determine that habitat was most important?
2. On page 20 of the Habitat Evaluation Report (“HER”) you mention “inflows of storm runoff deposits fine sediment from the urban drainage area.” How does this affect habitat?
3. On page 21, the HER refers to fluvial habitat. Is no such habitat present in the CAWS? Is it present in water bodies that are connected to the CAWS from which fish can swim into the CAWS.
4. On page 28 of the report you discuss the decision to develop a “system-specific index.” For what other water bodies has such an index been developed?
5. Where has the NWHI been used?
6. On page 31 the HER indicates that the macroinvertebrates were similar across the system and they were all pollution tolerant? What factors caused this? Are the same pollutants contained in all of the sediments across the whole system? Does Bubbly Creek and the North Branch have the same sediments and same macroinvertebrates?
7. Why would the fish vary more than the macroinvertebrates?
8. How did macroinvertebrates figure in your conclusions?
9. In your study you looked at various fish metrics? How was the fact that some of the fish in the CAWS came into the CAWS from the Great Lakes or the Upper North Branch or other waters figure into you evaluation?
10. With regard to the physical habitat data (p. 35), how were decisions made as to what was there?
11. As you inspected the system to determine the habitat were qualitative judgments made as to the extent of the physical feature present or absent?

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12. How far up and down from each station did you consider physical data? How did you decide how much of the area above and below each station was relevant to each station?
13. The HER refers to “bank condition and angle. (p. 38) How do these factors figure in? Did you look to see places where the vertical walls were cracked or deteriorated?
14. On page 41, the HER refers to “high turbidity in most of the system.” What exactly is turbidity? What parts of the system are not characterized by high turbidity?
15. On page 42, it is mentioned that visibility was limited to less than 0.5 meter outside of the Chicago River. What portion of the Chicago River had more visibility than 0.5 meters?
16. What is meant by the statement in the HER (p.42) that the amount of data that would be required to “validate the technology” was not available?
17. What kind of data was obtained from the bathymetry?
18. What exactly is this picture of on p. 43 of the HER?
19. On page 46 different types of sediment are discussed; plant debris, inorganic silt, and organic sludge. Which of these are most desirable? How far around each station was evaluated for these substrate variables?
20. How is the hydrology discussed on page 48 important? Did it figure into your conclusions?
21. At page 49 you discuss “man-made structure” as a factor detrimental to aquatic life and later it is seen that such structures were found to be a major factor affecting fish. Can you describe what is causing these structures to affect aquatic life adversely? Did you include the fish hotels as “man-made structures.” Are sewage treatment plant and CSO outfalls “man-made structures?” Do you believe that the man-made structures factor may be serving as a proxy for some other factors affecting aquatic life?
22. Please explain the use of the 2008 data mentioned on page 51 as a “validation dataset.”
23. Page 52 speaks again of macroinvertebrate data. Was this data used?
24. Page 54 of the HER refers to the Minarik report? Is this in the record? Did you ever see the actual hourly data as opposed to minimum, maximum and average figures? Were you able to see how DO moved during the course of a day from any data that you were given? Were there any areas where the data showed regular daily movements?
25. Please explain Figure 4-1. What does the y-axis mean in terms of habitat quality?
26. Are the sediment chemicals discussed on page 63 of the HER spread uniformly throughout the system? Are the levels of these toxins all at toxic levels?
27. Did you look at the potential effects of endocrine disrupting chemicals in the system?
28. What suggests an effect an “indirect effect” on fish of anthropogenic chemicals? Are these chemicals still entering the system?
29. On page 65, the HER identifies as a habitat limitation “suspended sediments that result from a combination of urban surface runoff dischargers, CSOs, treated discharges and navigation resuspension.” Did you measure the suspended sediment levels? Are suspended sediment levels uniformly high throughout the system or are they worse in some areas than others?
30. What is the import of figures 4-3 and 4-4 on page 67?
31. HER states that cover “can be improved in the CAWS.” Does this mean planting trees?
32. What is a “lack of natural sediment load?” (p. 71)
33. Page 78 of the HER provides flow data for the various tributaries of the CAWS. Did you look at any data regarding the water quality in the tributaries? Did you consider whether

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the various tributaries are providing habitat for any of the life stages of aquatic life that is or could live in the CAWS.

34. What is the significance of Figure 4-8 and 4-9?
35. Pages 80-1 of the HER discuss hydrology limitations. What import did this factor have?
36. What is the significance of Figures 4-11 and 4-12 on page 85?
37. Does Figure 4-13 show that there is essentially no commercial navigation on much of the North Branch and all of the North Shore Channel and Bubbly Creek?
38. On page 95 of the HER MWRD fish collection is discussed. Was all of that data collected through electrofishing?
39. Figure 5-1 identifies a number of species that were found in very low numbers in the CAWS. Was an attempt made to determine where those fish entered the CAWS? Are any of those fish capable of living in lakes or other slow water?
40. Which exactly are the fish that make up the "dominant species" in the CAWS?
41. Did Limnotech create any new fish metrics for its analysis or did it use established tests for the health of a fishery?
42. What are the "five ecological function categories" mentioned on page 99.
43. With regard to the discussion at page 101, how was macroinvertebrate data ultimately used in drawing conclusions?
44. Is the sediment uniformly toxic throughout the system? Is it possible to remediate sediment?
45. Regarding Table 6-2, which attributes are positive and which negative?
46. How was the presence of members of species that came into the CAWS from outside the system (yellow perch, coho) taken into account?
47. Regarding the 2008 Secchi data discussed on page 108-09, what was learned about turbidity in the various reaches of the system?
48. How is Secchi depth related to the quality of habitat? How is Secchi depth related to visibility? Compare page 109 (1 meter depth) and page 42 (0.5 visibility)
49. How does turbidity affect macrophytes? How is Secchi redundant of macrophyte data? Are fish affected by turbidity in ways other than lack of macrophyte habitat and food?
50. What water quality parameters were considered over what period other than DO and temperature? Did you ever consider endocrine disruptors?
51. In general, in looking at statistics, we want a high r-squared and a low P factor?
52. Why does the fact that the system is "highly regulated" (HER p. 112) make "flashiness" less important?
53. In general, is large substrate good or bad? What is unreliable about the data? (see p. 112). Are the cobble and boulders moving around over time?
54. Regarding Table 6-3 and the sediment & substrate variable, is this a positive or negative factor?
55. What is the r-squared and for each of the six habitat factors taken individually? What was the maximum r-squared for any of the factors taken individually?
56. Was any effort made to break the data down by segments of the CAWS? Is it thought that all of the factors are equally important to each segment? Is there enough data to break out r-squared numbers for particular segments?
57. What does it mean on page 117 that "it is assumed the individuals are independent."
58. Was the effect of DO broken down for any of the particular segments?
59. What were all the DO metrics considered?

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60. What does it mean that the r-squared is 0.29 for habitat factors for 2008?
61. What is the import of the fact that the fish data varies so much from year to year?
62. Would you expect to see similar levels of fish variability in data taken from other water bodies?
63. Page 124 of the HER states that a “wide range” of water quality metrics were evaluated with respect to fish data. Where do these evaluations appear in the report? What metrics were evaluated?
64. Are any of the habitat variables correlated (positively or negatively) with DO?
65. Are any of the habitat factors correlated with any of the other water quality metrics evaluated?
66. What is the significance of Table 7-1? Is presence of man-made structures driving much of the result?
67. Where in the HER can one see the basis for your conclusions on pages 10-11 of your pre-filed testimony that two habitat variables were the most important factors in describing fish data and a DO variable was the third most important?
68. What is the significance of the CAWS habitat index scores? Can these figures be compared to scores for any other water body?
69. Might areas outside the CAWS to some degree provide off-channel habitat?

REGARDING THE HABITAT IMPROVEMENT REPORT:

1. Did you look at areas outside the CAWS to determine whether any one the connected waters could serve as breeding habitat for fish that might migrate into the CAWS? Could any of those areas be improved?
2. The Habitat Improvement Report (“HIR”) mentions that Secchi depth is generally poor throughout the CAWS with a few exceptions where the CAWS is apparently receiving water from Lake Michigan. (p. 29) Why is the Secchi depth generally poor?
3. The HER discusses “man-made structures” as a negative factor affecting habitat while recognizing that man-made structures can be beneficial under some circumstances. (pp. 49,115, 124). Did you consider whether any changes in operations by the commercial or navigational operations using such structures could improve habitat?
4. Were you asked to look at any steps that might be taken to address the high turbidity which the HIR identifies as a problem at page 10.
5. The HIR identifies that lack of large substrate as an issue. (p. 21). Is there any reason why large substrate could not be placed in the portions of the CAWS not used for navigation?
6. Could work be done in the North Branch above its confluence with the North Shore Channel that would provide habitat for fish that could swim to the CAWS?
7. Did you consider whether any changes in the operations of the Corps of Engineers might improve conditions for aquatic life?
8. Might any changes in the operations of the MWRD benefit aquatic life?
9. Are you aware of proposals that were developed to establish prairies, and shallow aquatic areas in Bubbly Creek, the Collateral Channel and South Branch slips by the Wetlands Initiative in connection with development of mitigation sites for O’Hare airport expansion? Did you, or to your knowledge, anyone else employed by the MWRD make Limnotech aware of these proposals for use in making its habitat improvement study?

10. Have you been involved in projects to use wetlands to address problems from CSOs? Were you asked to look at the potential for reducing CSOs or reducing the effect of CSOs for this project?
11. Are you aware of any proposals to create wetlands in areas that are connected to the CAWS for treatment of nutrient pollution or CSOs.
12. Are you aware of cities that have made major changes in rivers that flow through or by them to improve habitat or aesthetic values of the river?
13. Is it correct to say that habitat could be most improved in the Cal-Sag Channel?
14. Were you asked to consider changes to the flow of the North Shore Channel, separation of the South Branch or the Sanitary Ship Canal from the main branch of the Chicago River, directing part of the flow of the Calumet plant to Lake Calumet for wetlands treatment or any other possible major changes to the CAWS as it is currently configured?

Respectfully submitted,



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Dated: February 23, 2011

CERTIFICATE OF SERVICE

I, Albert Ettinger, hereby certify that I have served the attached **Prefiled Questions to Ray Henry, James Huff, Adrienne Nemura, Scudder Mackey, Jennifer Wasik, David Zenz, and Scott Bell** upon:

Mr. John T. Therriault
Assistant Clerk of the Board
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via electronic filing on February 23, 2011; and upon the attached service list by depositing said documents in the United States Mail, postage prepaid, in Chicago, Illinois on February 23, 2011.

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