BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
WATER QUALITY STANDARDS AND	)	
EFFLUENT LIMITATIONS FOR THE	)	R08-9
CHICAGO AREA WATERWAY SYSTEM	)	(Rulemaking – Water)
AND THE LOWER DES PLAILNES RIVER:	)	
PROPOSED AMENDMENTS TO 35 Ill.	)	
Adm. Code Parts 301, 302, 303 and 304	)	

NOTICE OF FILING

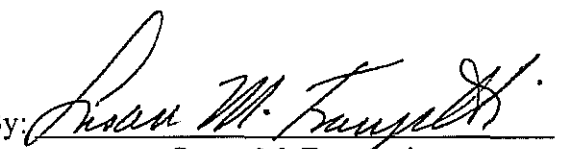
TO: John Therriault, Assistant Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph Street, Suite 11-500
Chicago, IL 60601

Attached Service List

PLEASE TAKE NOTICE that I have filed today with the Illinois Pollution Control Board **MIDWEST GENERATION'S QUESTIONS FOR THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY STAFF WITNESSES** and **MIDWEST GENERATION'S QUESTIONS FOR THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY WITNESS CHRIS O. YODER**, copies of which are herewith served upon you.

Dated: January 17, 2008

MIDWEST GENERATION, L.L.C.

By: 
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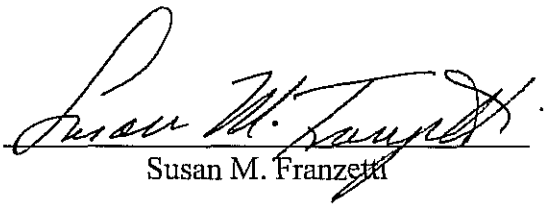
CERTIFICATE OF SERVICE

The undersigned, an attorney, certifies that true copies of the foregoing Notice of Filing and Midwest Generation's Questions for the Illinois Environmental Protection Agency Staff Witnesses and Midwest Generation's Questions for the Illinois Environmental Protection Agency Witness Chris O. Yoder were filed electronically on January 17, 2008 to the following:

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

and that true copies were mailed by First Class Mail, postage prepaid, or sent electronically on January 17, 2008 to the parties listed on the foregoing Service List.



Susan M. Franzetti

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

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WATER QUALITY STANDARDS AND	)	
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CHICAGO AREA WATERWAY SYSTEM	)	(Rulemaking – Water)
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PROPOSED AMENDMENTS TO 35 Ill.	)	
Adm. Code Parts 301, 302, 303 and 304	)	

MIDWEST GENERATION'S QUESTIONS FOR THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY STAFF WITNESSES

Midwest Generation, L.L.C. ("Midwest Generation" or "MWGen"), by and through its attorneys, Franzetti Law Firm P.C. and Hunton & Williams LLP, submits the following questions based upon the Proposed Amendments to 35 Ill. Adm. Code Parts 301, 302,303 and 304, the Statement of Reasons and its Attachments, and the testimony submitted by the Illinois Environmental Protection Agency ("Agency" or "Illinois EPA") for Roy Smogor ("Smogor"), Rob Sulski ("Sulski") and Scott Twait ("Twait") in this rule-making proceeding. Midwest Generation is separately filing questions based upon the testimony submitted by the Illinois EPA for Chris O. Yoder ("Yoder").

Midwest Generation's questions are organized in an outline format under topical headings based on issues raised by the proposed rules. The questions are necessarily comprehensive because of the significant issues raised in this proceeding regarding the technical and scientific basis for the proposed rules, the proposed use designations and the overly stringent proposed thermal water quality standards for the Chicago Sanitary and Ship Canal ("CSSC"), Brandon Pool and the Upper Dresden Pool which are not based on the many years of stream survey data that has been submitted to the Agency.

In an effort to facilitate the Agency's preparation of responses, citations to specific pages and relevant language from the Agency's Proposed Rules, Statement of Reasons and/or Witness Testimony are provided. For the Agency staff witnesses, Midwest Generation has not designated a specific witness to respond to the questions presented as prior discussion with the Agency's counsel determined that the Agency prefers to have the discretion to determine which of its witnesses will respond at the hearing. However, while these questions are not directed to specific Agency staff witnesses, Midwest Generation does request that the Agency provide answers specific to each question posed. Midwest Generation further requests that the Hearing Officer allow follow-up questioning to be posed based on the answers provided.

QUESTIONS

I. Statutory Basis and Legal Framework

A. Environmental Protection Act

1. In its Statement of Reasons at p.2, the Illinois EPA references the following language from Section 27(a) of the Illinois Environmental Protection Act which identifies the criteria that the Board is required to take into account in this rule-making: "the existing physical conditions, the character of the area involved, including the character of surrounding land uses, zoning classifications, the nature of the existing air quality or receiving body of water, as the case may be, and the technical feasibility and economic reasonableness of measuring or reducing the particular type of pollution. (415 ILCS 5/27(a) (2006).)" For the area encompassing the Chicago Sanitary and Ship Canal and downstream through the Upper Dresden Pool, please provide the following information

a) Has the Illinois EPA reviewed "the character of the area involved" and, if so, please provide the information the Agency has on the character of the area involved.

b) Has the Illinois EPA reviewed the "zoning classifications" and, if so, please provide the zoning classification information the Agency has reviewed.

c) Has the Illinois EPA reviewed "the existing physical conditions" in relation to habitat requirements (e.g., substrate, spawning materials, migration access, dissolved oxygen levels, toxicants) of the species and life stages that are being used to establish the proposed thermal water quality standards? If so, how was this done?

d) Has the Illinois EPA calculated the total cost (including capital, O&M, energy, and cross-media environmental costs) for point sources of reducing the particular types of pollution that will be subject to more stringent standards if the Board adopts the current proposal?

e) Has the Illinois EPA considered the contribution of and possible need for reductions by nonpoint sources? If so, has it estimated the costs of such controls?

f) Has it considered how those costs or any point or nonpoint source controls will affect Illinois tax payer and rate payers and the Illinois economy overall? Has it attempted to estimate what the social impacts of imposing those costs will be?

g) Has it made any attempt to gauge the "economic reasonableness" of achieving those standards and, if so, what assessment criteria did it use?

B. Clean Water Act and Federal Regulations

1. The Statement of Reasons, pp. 10-7, describes the federal statutory provisions applicable to establishment of water quality standards. In particular, it notes that § 101(a)(2) of the CWA establishes a "national goal that, wherever attainable, an interim goal of water quality that provides for the protection and propagation of fish, shellfish, and wildlife" be achieved. It further notes that 303(c)(2)(A) requires states, in setting standards, to serve the purposes of the CWA, and to take into consideration the use and value of waters for, inter alia, propagation of fish and wildlife, industrial uses, and other purposes. It then describes U.S. EPA's water quality standards regulations as interpreting § 303(c)(2)(A) to mean that "water quality standards, wherever attainable, provide water quality for the protection and propagation of fish, shellfish, and wildlife."

a) Is there anything in the CWA or implementing regulations that specifies what species of biological assemblage is to be protected?

b) Are there any other CWA provisions that apply with respect to water quality standards for temperature? What are they, and how do they apply to the development or implementation of thermal standards for the waters under consideration here?

2. On pp. 5-6 of the Statement of Reasons, the Illinois EPA cites U.S. EPA's regulatory requirements for conducting use attainability analyses to evaluate potential changes in designated uses, 40 C.F.R. § 131.10(g).

a) Is it correct that this is the first UAA for any Illinois waterbody in which the Illinois EPA?

b) Given that this is the first time that the Illinois EPA has applied the federal UAA regulations, is there any published federal guidance on the performance of UAAs that the Illinois EPA tried to follow here or otherwise received from U.S. EPA that you can identify for us?

C. Applicable Board Regulations and Regulatory History

1. On p. 10-11 of the Statement of Reasons, it is noted that "[i]n its Opinion in R72-4, the Board stated that "The basis for the Board's decision to use the I-55 bridge as a boundary for the division of the Des Plaines River into restrictive and General Use is that the location of the bridge corresponds to changes in the physical environment characteristics of the area. R72-4, Slip Op. at 5 (November 8, 1973)."

a) Does the Illinois EPA agree that the location of the I-55 Bridge still corresponds today to the changes in the physical environmental characteristics of the area? Please provide the reasons for your answer.

D. History of Thermal Demonstrations and Thermal Adjusted Standards in the Chicago Area Waterway System and Lower Des Plaines River

1. On pp. 13-14 of its Statement of Reasons, the Illinois EPA describes the 1996 Adjusted Standard from the General Use thermal water quality standards granted to Commonwealth Edison in AS96-10 which is applicable at the I-55 Bridge on the Lower Des Plaines River and later, on March 16, 2000, was transferred to Midwest Generation. With respect to this Adjusted Standard, please respond to the following questions:

a) Does the Illinois EPA agree that in the AS96-10 Board decision, the Illinois EPA and the Board found that

Commonwealth Edison ("ComEd"), Midwest Generation's predecessor, had successfully demonstrated that the heat discharges from the Joliet Station did not cause nor could reasonably expected to cause significant ecological damage to the waters of the Five-Mile Stretch (Lower Des Plaines below I-55)? If so, please explain whether the Illinois EPA's position regarding the lack of significant adverse ecological impact from the MWGen Joliet Station has changed and if so, explain the reasons for its change in position.

b) The Statement of Reasons refers to Appendix A at 2-84 for a description of the basis for the Adjusted Standard. Appendix A at 2-84 states that "the Illinois EPA agreed that heat was not a factor limiting the quality of the aquatic habitat of the Five-Mile Stretch." Does the Illinois EPA agree that in the AS96-10 proceeding, the Illinois EPA agreed, and the Board concurred, that the temperature of the waters of the Five-Mile Stretch was not a factor limiting its quality, and that other factors continued to override the effect of temperature on the waterway, such as loss of habitat due to channelization, disruption of habitat due to barge traffic, and the presence of heavy metals and other pollutants in the system?

(i) Is it now the Illinois EPA's position that these factors have changed favorably, such that temperature has now become a limiting factor for improvements to the biological community of the waterway and, if so, please explain the factual basis for the change in Illinois EPA's position?

c) Appendix A at 2-84 further states that "[t]he Board noted that the Agency (IEPA) concluded that as long as the Joliet Station meets all the applicable standards at the point of discharge and in the downstream General Use waters, the Agency did not view the Joliet Station's thermal discharges as limiting aquatic diversity in the receiving waters." It goes on to note that Midwest Generation's predecessor, Commonwealth Edison, then undertook a multi-year study of the effect of heated effluent on the receiving stream, which was conducted by a reputable team of scientists from three universities and Edison ecological consultants.

(i) Does the Illinois EPA agree with the Board's past findings, which were based on extensive study, that

temperature is not a factor limiting aquatic diversity in the Five-Mile Stretch downstream from the I-55 bridge?

d) Pursuant to the terms of the Adjusted Standard granted by the Board in AS96-10, Commonwealth Edison and, since 2000, Midwest Generation, have conducted annual stream surveys on the Lower Des Plaines River and submitted the results of those surveys to the Illinois EPA.

(i) Does the Illinois EPA agree that the results of those ongoing annual surveys of the fish community in the waterways adjacent to the five Midwest Generation electrical generating stations have shown that the thermal discharges from the five Midwest Generation electrical generating stations have not adversely affected the maintenance of a balanced indigenous aquatic population in the area at and downstream of the I-55 Bridge? If you disagree, then what is the rationale?

(ii) Does the Agency agree that the results have shown that the aquatic community has shown some improvement over the time since the alternate standards have gone into effect? If you disagree, can you identify any field sampling data on which your position is based?

e) In what way and to what extent, if any, does the aquatic community in the Five-Mile Stretch differ from the community in the Upper Dresden Island Pool?

f) In the AS96-10 Board decision, regarding the issue of environmental impact, the Board found that: "[t]he upstream reach of the South Branch of the Chicago River, the Chicago Sanitary and Ship Canal, and the Des Plaines River is greatly modified by use as a shipping channel with habitat limited to deep pools without shallows, structure, riffles of suitable substrates." And further found: "[t]he waterway is a very artificial and significantly modified waterway that is limited in terms of habitat" Is the Illinois EPA's position that the habitat described in the AS96-10 decision has changed and, if so, describe the stream survey data on which this position is based?

g) In the AS96-10 Board decision, the Board found that the area affected by the proposed (I-55) adjusted standard is heavily developed with industries, including a refinery, a chemical plant and a boatyard. Is it the Illinois EPA's position that these characteristics of the Upper Dresden

Pool have changed and, if so, describe the data on which this position is based?

h) In the AS96-10 Board decision, the Board found that: "[h]istorical practices have caused substantial residual chemical contamination to be present in the sediments of the waterway." Is it the Illinois EPA's position that this condition has changed and, if so, describe the data on which this position is based?

i) In its submission in the AS96-10 proceeding the Illinois EPA stated: "[t]e Agency believes that it is technically feasible to reduce temperature of the effluents by the use of cooling towers and spray ponds. However, the Agency believes that the cost of providing this cooling may not be economically reasonable when compared to the likelihood of no improvement in the aquatic community." What is the Agency's current position on the likelihood of any significant improvement in the aquatic community and identify any scientific data that supports its position?

j) If the Board were to adopt the Illinois EPA's proposed thermal water quality standards for the Upper Dresden Pool, how would this affect the continuance of the AS96-10 Adjusted Standard granted to Midwest Generation?

II. Regulatory Proposal: Purpose and Effect

A. Introduction – Description and History of the Chicago Area Waterway System and Lower Des Plaines River

1. At p. 14 of the Statement of Reasons, the Illinois EPA states: "[w]ith the urban development of the Chicago metropolitan area, CAWS and Lower Des Plaines River grew in importance as a storm water management system."

a) Does of the CSSC portion of the CAWS and the Upper Dresden Pool of the Lower Des Plaines River still serve today as a storm water management system?

B. Description of the Secondary Contact and Indigenous Aquatic Life Use Designations

1. At the bottom of p. 19 of the Statement of Reasons, the Illinois EPA lists the following characteristics of the CAWS and LDP that existed in the 1970's and were the basis of their designation as Secondary Contact:

- Routinely dredged and maintained channels, including steep-sided cross-sections designed to accommodate barge traffic and optimize flow.

- Significant sludge deposition, as a result of CSOs, industrial waste discharges and urban runoff.

- The entire system has minimum slope and consequently low velocity, stagnant flow conditions. Diversion of Lake Michigan water is kept as low as possible.

- Urban stress is significant within the entire drainage area.

- Good physical habitat for aquatic communities in the main channel was nonexistent due to the impact of commercial and recreational watercraft use of the system as well as sludge deposition.

- In addition to the above human-made and irretrievable modifications, the CAWS also carries a massive wastewater load including CSOs during wet weather.

Isn't it correct that all of these characteristics still exist today in the CSSC and the Upper Dresden Pool portions of the CAWS and LDP?

2. If the Illinois EPA maintains that one or more of the above characteristics no longer apply to the CSSC and the Upper Dresden Pool, then describe the factual data and information that supports the Agency's position.

3. Is the CAWS achieving current water quality standards or is it listed as impaired under Section 303(d) of the CWA?

   a) If the latter, isn't it correct that the CAWS is impaired for PCBs, organic enrichment, low dissolved oxygen, flow alteration, habitat alteration, suspended solids, priority organics, metals, cadmium, chromium, mercury, zinc, cyanide, nutrients, phosphorous, and total ammonia-N? If not, please identify the sources of impairment and what segments of the CAWS are so impaired.

   b) Will the proposed designated use changes in any way affect these sources of impairments?

4. Is CAWS listed as impaired for temperature?

5. What impact, if any, do the impairments above have on aquatic life? On protection and propagation of indigenous population of shellfish, fish, and wildlife?

6. Does the Agency plan to develop a TMDL for the CAWS to address these impairments? If so, how will the proposed higher use designations for the CAWS affect the development of a TMDL?

7. What are the bio-accumulative risks to humans/wildlife from fish tissue containing persistent organic pollutants, such as PCBs, and mercury?

8. Has the Agency conducted any fish tissue tests to determine the level of bio-accumulative chemicals?

9. Has the Agency considered the ecological and human health risks associated with upgrading beneficial use designations?

III. Use Attainability Analysis for the CAWS

A. Lack of Attainment of CWA Goals

1. On p. 9 of the CDM UAA Report for the CAWS, CDM determined that "none of the waterbodies could achieve Clean Water Act goals due to limitations described in the 6 UAA factors." CDM also concluded that several waterway and effluent management controls would need to be implemented before the CAWS could achieve all of its recommended uses. At p. 16 of the CDM Report, it is acknowledged that these conditions "are not reversible in the foreseeable future."

a) Given that none of these management controls have begun and there is no timetable for implementing them, why does the Illinois EPA believe that more restrictive thermal water quality standards are necessary for the CAWS?

b) Given the constraints and stressors identified in the CAWS UAA Report, why does the Illinois EPA believe the aquatic community in the CAWS will respond positively to more restrictive thermal water quality standards?

IV. Use Attainability Analysis for the Lower Des Plaines

A. Highly Modified Waterbody

1. On p. 22 of the Statement of Reasons, the Illinois EPA states: "It is clear from the UAA that Lower Des Plaines River continues to

be a highly modified waterbody that does not resemble its pre-urbanized state."

a) What it is the intended meaning of the phrase "highly modified waterbody"?

b) With respect to the explanation of the meaning of the "highly modified" nature of the Lower Des Plaines River, for which of the criteria in Section 27(a) of the Illinois Environmental Protection Act (e.g., "the existing physical conditions, the character of the area involved, including the character of surrounding land uses, zoning classifications, the nature of the existing air quality or receiving body of water, as the case may be, and the technical feasibility and economic reasonableness of measuring or reducing the particular type of pollution") does this finding provide relevant facts for the Board to consider?

2. On p. 22 of the Statement of Reasons, the Illinois EPA states: "[w]hile there has been improvement and potential exists for additional improvement, the UAA did not find the Lower Des Plaines River to be capable of full attainment of the aquatic life and recreational goals of the Clean Water Act for un-impacted waters in the foreseeable future." Conversely, on p. 52 of the Statement of Reasons, the Illinois EPA states: "Upper Dresden Pool is capable of maintaining a biological condition that minimally meets the [CWA's] Aquatic Life goal." And on p. 13 of Sulski Pre-Filed Testimony, it is stated that "Illinois EPA is recommending three levels of biological potential in the CAWS and Lower Des Plaines River; and ... two of the three levels do not meet the Clean Water Act's aquatic life goal ...." What is the Illinois EPA's position on the level of aquatic life use that the Upper Dresden Pool is capable of attaining and what is the basis for that position?

3. Similarly, on p. 94 of the Statement of Reasons, the Illinois EPA states that its consultants recommended the adoption of a reduced biotic integrity status for the Upper Dresden Pool and that its proposed use designation is "consistent" with the consultants' recommendation. Does this mean that the proposed Upper Dresden Pool Aquatic Life Use designation is something less than the CWA's aquatic life goal?

4. On p. 8 of Sulski's Pre-Filed Testimony, it is stated that the consultant AquaNova's recommended aquatic life use for the Upper Dresden Island Pool "recognized reduced biotic integrity due to impoundment." Explain the meaning of the phrase

"reduced biotic integrity due to impoundment" and identify the relevant criteria in Section 27 of the Illinois Environmental Protection Act to which this information applies?

5. On p. 8 of Sulski's Pre-Filed Testimony, it is stated that "Illinois EPA took into account additional habitat and aquatic life data not available at the conclusion of the AquaNova's contract obligations towards the Lower Des Plaines UAA. The additional data is found in Attachments MM, R and S of the Statement of Reasons."

   a) Did the Illinois EPA's review of the cited additional habitat and aquatic life data result in any changes to the findings concerning the aquatic life use potential of the Upper Dresden Island Pool? If so, explain what those changes were and identify the data that the Illinois EPA claims supports those changes.

6. On p. 10 of Sulski's Pre-Filed Testimony, it is stated that additional habitat and aquatic-life data were generated by MBI and EA Engineering, Science and Technology, referring to Attachments S and MM of the Statement of Reasons.

   a) Did the Illinois EPA retain MBI to generate the additional data contained in Attachment S? If not, how did the MBI additional data come to be collected and how did the Illinois EPA receive it?

   b) When did the Illinois EPA receive the MBI data in Attachment S?

   c) Was the MBI data in Attachment S distributed to the Lower Des Plaines River stakeholders group prior to its filing in this proceeding?

   d) Explain how the Illinois EPA took the EA Engineering data in Attachment MM into account in determining the aquatic life use for Upper Dresden Pool?

   e) Based on the Illinois EPA's review of the MBI Attachment S data and the EA Engineering Attachment MM data, did it find that the data was consistent or were there inconsistencies between these two data sets? Explain any inconsistencies and how the Illinois EPA took them into account in making its decision on the proposed aquatic life use for the Upper Dresden Island Pool?

7. For the Upper Dresden Pool, what are the "existing uses" (i.e., the uses actually attained on or after November 28, 1975) that have

been identified by the Illinois EPA and are to be protected by the proposed use designation?

8. For the Brandon Pool and the CSSC, what are the "existing uses" (i.e., the uses actually attained on or after November 28, 1975) that have been identified by the Illinois EPA and are to be protected by the proposed use designation?

9. In a March 13, 2006, U.S. EPA memorandum entitled "Improving the Effectiveness of the Use Attainability Process," U.S. EPA states that "a credible UAA can result in a change in designated use in either direction", i.e., more stringent or less stringent designated uses, and that could "lead to either more or less protective criteria." Does IEPA agree with this statement? If not, please explain.

   Memo available at http://www.epa.gov/waterscience/standards/uaa/pdf/memo_king.pdf

10. At p. 2 of Smogor's Pre-Filed Testimony, it is noted that the Upper Dresden Pool has unique flow conditions due to the need to maintain the navigational use and flood control. Given these unique flow conditions and the impounded nature of the Upper Dresden Pool, does the Illinois EPA agree that the Upper Dresden Pool is "use-impaired"?

11. At p. 3 of Smogor's Pre-Filed Testimony, there is a reference to a lack of improvements in the conditions in the Upper Dresden Pool, given that the navigational use and flow management controls for the Upper Dresden Pool will continue for the foreseeable future, does the Illinois EPA agree that these constraints are irreversible?

V. Regulatory Proposal: Regulatory Language

A. Part 301 Definitions

1. §301.307 Lower Des Plaines River (LDP): The term "Lower Des Plaines River" is commonly used to refer to the stretch of the Des Plaines River from the confluence with the CSSC to the confluence with the Kankakee River. The current UAA proceeding defines the I-55 Bridge as the farthest extent of the Lower Des Plaines River. Has the Agency considered that its abbreviated definition may cause confusion given its more limited scope and perhaps, instead, another defined term should be used to identify this more limited stretch of the river?

B. Part 302

1. The language of proposed Section 302.402 Purpose and the language of proposed Section 303.204 Chicago Area Waterway System and Lower Des Plaines River Waters are very similar. What is the intended difference between these two proposed regulations?

2. With respect to the language of proposed Section 302.402, if one of the purposes of the CAWS and Lower Des Plaines River standards is to protect "industrial water supply uses," explain how the proposed standards accomplish this purpose?

C. Part 303 – Use Designations

1. Why did the Agency elect to use these water-body specific use designations rather than the nonspecific classification approach used in the existing Part 303 Subpart B existing use designations?

2. On p. 24 of the Statement of Reasons, the Illinois EPA states as follows: "When the Board is faced with a proposal to update the one-size-fits-all use designations for the rest of the State, IEPA expects there to be no need to reopen these uses and standards designed to apply specifically to these waters."

   a) Is this the reasoning behind the Agency's highly water-body specific structure proposed for these use designations?

   b) Isn't there the possibility that planned, future revisions to the existing Illinois use classification system may support a different approach to these waters? And if so, why should they be excluded from potential revisions based on further consideration of what the updated Illinois use classification system should be?

   c) Why didn't the Agency instead propose "Aquatic Life Use A" and "Aquatic Life Use B" use designations that are nonspecific and can apply to other waterways in the state that may be similar to the waterbodies involved in this rule-making in order to minimize the potential for multiple use designations in the future that are duplicative or overlapping in their scope and intent?

   d) Did the Illinois EPA consider the approach taken by the State of Colorado which has a use classification category for waters that are wastewater dominated or effluent

dependent (e.g., a high percentage of the flow is wastewater)?

e) Doesn't this approach increase the likelihood that as the Illinois EPA reviews existing use designations in other waterbodies of the state, such as in the context of TMDLs that may identify the need for a use designation change, it will then propose additional waterbody specific use classifications to the Board?

f) Why isn't it preferable to first propose an updated, state-wide use classification rule-making rather than proceed first with a piece-meal approach to adding new use classifications to the Illinois water quality standards regulations?

g) Isn't this waterbody-specific use designation approach increasing the likelihood of creating a complicated, potentially contradictory and extensive list of use designations in the absence of establishing a revised, updated state-wide use classification system first?

h) Given the waterbody-specific nature of these proposed use designations, is this rule-making accurately categorized as a regulation of general applicability under Illinois law?

i) Is there precedent in other states for taking this type of water-body specific approach to creating a revised use classification system?

j) The proposed placement of these waterbody-specific proposed use designations within Subpart B, which is entitled "Nonspecific Water Use Designations" does not seem appropriate and may create confusion. Has the Agency considered these issues and concerns?

3. **"Section 303.204 Chicago Area Waterway System and Lower Des Plaines River Waters:** The Chicago Area Waterway System and Lower Des Plaines River Waters are designated to protect for incidental contact or non-contact recreational uses, except where designated as non-recreational waters; commercial activity, including navigation and industrial water supply uses; and the highest quality aquatic life and wildlife that is attainable, limited only by the physical condition of these waters and hydrologic modifications to these waters. These waters are required to meet the standards contained in Subpart D of Part 302, but are not

required to meet the general use standards or the public food processing water supply."

a) What is the intended meaning and purpose of the first sentence of this section that lists all of the various use designations employed for the multiple segments of the CAWS and Lower Des Plaines River, and why is it necessary?

b) What use designation is intended to be described by the language "the highest quality aquatic life and wildlife that is attainable limited only by the physical condition of these waters, and hydrologic modifications to these waters"?

(i) What is the intended meaning of this language as applied to the waterbody segments that are subject to one of the three separate, proposed aquatic life use designations A, B and Upper Dresden Pool in proposed sections 303.230, 303.235 and 303.237?

(ii) Is this language properly included in a "use definition" or is it more suited to being the intended "goal" of the proposed aquatic life use designations for these waterways?

(iii) What is the regulatory effect of this language? In other words, does the highest quality aquatic life that is attainable limited only by physical conditions and hydrologic modifications change from year to year under this type of "use definition" or does it somehow modify the aquatic use designations set forth in proposed Sections 303,230, 303.235 and 303.237?

(iv) Why is this language necessary when the aquatic life use designations separately described in 303,230, 303.235 and 303.237 specify the proposed aquatic life use designations?

c) What uses are intended to be protected by the "commercial activity, including navigation and industrial water supply uses" language? Has the Illinois EPA considered the potential for its proposed aquatic life uses to conflict with the navigation use (for instance, where wakes or propellers displace organisms, temporarily disturb substrate, or cause abrupt changes in water levels), as it did in developing its proposed recreational uses? If so, how does it anticipate any such conflict would be resolved?

d) The Statement of Reasons (pp. 5-6), Attachment A at 1-3, and the Sulski Pre-Filed Testimony (p. 6) all recognize six (6) factors that are relevant in evaluating use attainability:1- naturally occurring pollutant concentrations; 2 -natural, ephemeral, intermittent, or low flow conditions or water levels; 3 - human caused conditions that cannot be remedied or would cause more damage to correct than leave in place; 4 - hydrologic modifications; 5 - physical conditions related to waterbody features; and 6 - economic and social impacts of imposing more stringent controls. This overarching statement regarding the use designation for CAWS and the Lower Des Plaines River appears to acknowledge only two of those limitations – physical conditions and hydrologic modifications – as limiting the proposed aquatic life uses.

(i) To what extent has the Illinois EPA considered the other four factors in developing the proposed aquatic life uses?

D. New Definitions and Designations for Human-Contact Recreational Activities

1. On p. 35 of the Statement of Reasons, the IEPA cites to "an average of 15 CSO events per year" in the CAWS and Lower Des Plaines River. Please explain how the Illinois EPA calculated this average number of CSO events per year as it appears to be significantly lower than other sources reported numbers of CSO events in the subject area.

E. Aquatic Life Use Designations

1. At pp. 46-47 of its Statement of Reasons, the Illinois EPA states that it relied on "two" UAA factors to determine that the biological conditions in the CAWS and Lower Des Plaines River do not meet the CWA's aquatic life goals but the following three UAA factors are listed: 3- human caused conditions or sources of pollution; 4 – dams, diversions or other types of hydrologic modifications; 5 – physical conditions related to natural features of the waterbody. (See also Statement of Reasons at p. 97 and Pre-Filed Testimony of Sulski at p. 13) Please confirm that the Illinois EPA relied on the three listed UAA factors rather than only two of them.

2. For the three UAA factors listed by the Illinois EPA, did the Agency determine that each of these factors apply to the waterbody segments included in the Aquatic Life Use B use designation?

3. For the Upper Dresden Pool, which of the UAA factors did the Illinois EPA find were applicable?

4. On p. 13 of the Pre-Filed Testimony of Sulski, it is stated that "[i]n reaches where attainable uses are not being met Illinois EPA has concluded that low dissolved oxygen and high temperatures are major water quality constraints."

   a) Identify each of the reaches for which Illinois EPA has concluded that high temperatures are a major water quality constraint and identify what attainable uses are not being met?

   b) Has the IEPA used a formal process of causal analysis for determining what pollutants are responsible for the waterway being biologically degraded, such as EPA's 2000 "Stressor Identification Guidance Document" (EPA/822/B-00/025), the EPA CADDIS system, or a recent article on the subject by Suter and others (Suter, G. W. II, S. M. Cormier, and S. B. Norton. 2007. Ecological epidemiology and causal analysis. Ch. 4 in G. W. Suter II (ed.) *Ecological Risk Assessment*, 2nd Edition. Taylor & Francis, Boca Raton, FL.)?

   c) For these reaches, what is meant by the phrase "major water quality constraint"?

   d) Does this testimony mean that the only major causes for why these reaches are not attaining a higher aquatic life use are low DO and high temperature?

   e) Is it the Illinois EPA's position that none of the following are major water quality constraints in the subject reaches: lack of adequate habitat, CSOs, non-point source urban run-off and flow alterations/modifications?

   f) What minimum temperature begins the range of temperatures that are referred to here as "high"?

   g) Where are these temperatures located in the subject reaches (e.g., are they at the surface)?

   h) Explain the basis for the Illinois EPA's finding that only low DO and high temperatures are the major water quality constraints and identify the technical or scientific data that supports the Illinois EPA's finding.

i) If known, for each such reach being referred to in the quoted language above, what are the causes of the "high temperatures" referred to in this testimony?

5. The stated purpose of state 305(b) reporting is to be "an assessment of the quality of the state's surface and groundwater resources" Of the 51 possible causes of non-attainment of beneficial uses, the Agency identified 31 existing causes, including nutrients, pathogens, metals, organic chemicals, sediments, flow alterations, and physical habitat among others. Why is temperature not identified as a cause of non- to partial attainment of beneficial uses if this is the purpose of the 305(b) reporting process?

6. It is well documented that fish are adversely affected below municipal wastewater effluents by endocrine disrupting chemicals (EDCs) that are not removed by the treatment process. Low concentrations of 2 of these chemicals commonly found in these systems have been shown to cause a collapse of fisheries in a recent Canadian study published in the prestigious Proceedings of the National Academy of Sciences. Was the presence of EDCs in this effluent dominated system considered as a cause of non-attainment? How can these stressors be removed from the system?

7. There is a clear link established by the U.S. EPA between sediment contamination and fish tissue advisories.

   a) Given that the fish in this system exceed fish tissue advisories for Hg and PCBs, isn't this likely due to the contaminated sediments that are present?

   b) Do the contaminated sediments present a risk both to humans and wildlife?

   c) Are the CSO's that exist in the waterway a contributing, continuing source of mercury to the system that will continue for many years?

   d) What is the Agency or any other regulatory agency doing at present to mitigate this critical problem that affects beneficial uses?

8. What is the difference between the existing "Indigenous Aquatic Life" aquatic life use designation in the Illinois regulations and the "Aquatic Life Use B" proposed aquatic life use designation?

9. On p. 17 of the Pre-Filed Testimony of Sulski, in describing the CAWS and Brandon Pool Aquatic Life Use B waters, it is stated

that "such conditions are irreversible." What is the technical or scientific basis for this statement?

10. On p. 47 of the Statement of Reasons, the Illinois EPA states that the CAWS and the Lower Des Plaines River "have unique habitat conditions." What are the "unique habitat conditions" for the CAWS and the Lower Des Plaines River?

11. How does the "biological potential," referenced at p. 48 of the Statement of Reasons, for the Upper Dresden Pool differ from the biological potential for the Aquatic Life Use B Waters?

12. With respect to the characteristics of the Upper Dresden Pool, it is stated at p. 14, 2nd paragraph, of Sulski Pre-Filed Testimony that the mid-stream channel is flanked by littoral zones with sand and gravel.

    a) What is the technical basis or supporting data for this statement?

    b) Are there any studies that support this statement and if so, please identify them?

    c) Haven't prior studies in the Upper Dresden Pool identified this area as more accurately characterized as "silty"?

13. With respect to the characteristics of the Upper Dresden Pool, the Illinois EPA states at p. 51 of the Statement of Reasons and at p. 14 of the Sulski Pre-Filed Testimony that it contains "earthen bank reach with fixed aquatic and overhanging riparian vegetation, and other zones of refugia for aquatic life." Describe what portion or percentage of the Upper Dresden Pool includes such characteristics?

14. It is noted that the Upper Dresden Midstream Channel is generally about 15 ft. deep (Statement of Reasons at p. 51; Sulski Pre-Filed Testimony at p. 14), but there is no discussion on the rate of flow changes in the Upper Dresden Pool. Isn't the rate of flow changes in the Upper Dresden Pool an equally or more critical factor in terms of the effect on aquatic life than the depth of the pool?

15. With respect to flow changes that occur on a continuing basis in the Upper Dresden Pool, did the Illinois EPA consider whether those flow changes occur at a significant order of magnitude and whether those changes have a negative impact on aquatic life? If so, please explain the Illinois EPA's analysis of the degree and level of impact caused by flow changes within the Upper Dresden Pool?

16. At p. 14 of the Sulski Pre-Filed Testimony, it is stated that the "Upper Dresden Island Pool is subject to recurring impacts from navigation use and upstream flood control functions, but to a lesser degree than found in CAWS Aquatic Life Use A and Use B waters." Please describe in greater detail or provide some quantification of what is meant by the phrase "to a lesser degree."

17. At p. 52 of the Statement of Reasons, the Illinois EPA states: "Upper Dresden Pool is capable of maintaining a biological condition that minimally meets the [CWA's] Aquatic Life goal." There are no attachments cited in support of this statement. What is the scientific and/or technical basis for this statement?

18. Is it the Agency's belief that it is required or compelled by the CWA to upgrade the designated uses? Please explain.

F. Aquatic Life Use Designations – Proposed Regulatory Language

1. In the proposed aquatic life use designation descriptions for each of the three proposed uses, there are classes of aquatic-life populations described. For example, the Upper Dresden Pool is described as being capable of maintaining aquatic-life populations consisting of "tolerant, intermediately tolerant and intolerant types," versus Aquatic Life A Use which is "predominated by tolerant or intermediately tolerant types" and Aquatic Life B Use which is "predominated by tolerant types."

   a) Is it intended that the three stated types of aquatic life, namely (i) tolerant, (ii) intermediately tolerant and (iii) intolerant, are what is intended to define the differences between these three proposed aquatic life use designations?

   b) Are the three stated types of aquatic life determinative of what the aquatic life use attainment is for the waterbody?

   c) What pollutants or conditions did the Illinois EPA consider or intend be considered in determining whether aquatic life is tolerant, intermediately tolerant, or intolerant?

   d) What is the intended meaning of the term "predominated"?

   e) What is the intended meaning of the term "individuals" as used in the phrase "populations predominated by individuals"?

   f) What is the intended meaning of the term "capable of maintaining" as used in the Upper Dresden Pool Aquatic Life use designation?

2. Do these types of aquatic life also have to be capable of adapting to the physical conditions that follow in the language of each use designation? (i.e., physical conditions, flow patterns and operational controls necessary to maintain navigational use, etc.)?

3. Does existing data on the waterway show that the aquatic life present has adapted to the unique flow and physical conditions of the waterway?

4. What types of "intolerant" species, as referred to in this use designation, are capable of adapting to the conditions described in the proposed use designation?

5. What scientific data supports the Illinois EPA's conclusion that intolerant fish species can "adapt" to the type of physical and flow conditions that are present in the Upper Dresden Pool?

6. Has the aquatic life present in the CSSC and the Upper Dresden Pool also adapted to the temperature regimes of the waterway?

7. There are also some differences in the language of the proposed aquatic life use designations that describes the physical conditions for the use designation to which it appears the aquatic life must be able to adapt. For example, compare "adaptive to the unique flow conditions necessary to maintain navigational use and upstream flood control functions of the waterway system" (Upper Dresden Pool) to "adaptive to the unique physical conditions, flow patterns and operational controls necessary to maintain navigational use, flood control, and drainage functions of the waterway system" (Aquatic Life Use A Waters). Are these similar but different descriptions intended to have different meanings and if so, please explain the difference in meaning?

    a) Is it the Agency's position that the Upper Dresden Pool does not have "unique physical conditions" only "unique flow conditions"? And what is the intended meaning of the term "unique" as used in these descriptions of the aquatic life use classification?

    b) What is the difference between the Upper Dresden Pool "unique flow conditions" versus the "unique flow patterns" of Aquatic Life Use A Waters?

    c) The description of the Upper Dresden Pool does not include "operational controls" as does the description of Aquatic Life Use A. What is the meaning of "operational controls"?

d) In the description of the Upper Dresden Pool Aquatic Life Use, there is no mention of "drainage functions" of the waterway system. Is it the Agency's position that the Upper Dresden Pool does not serve any drainage functions for the waterway?

8. Does the use of the "adaptive to" qualifying language mean that only aquatic life that can adapt to these conditions is intended to be protected? And, is that consistent with the MBI/CABB 2005 Report's approach to setting thermal WQS that the Agency relied upon here?

9. Given that the Brandon Pool is immediately upstream of the Upper Dresden Pool, and the Brandon Pool is proposed for a lower use designation and hence more lenient water quality standards for temperature and DO, for example, than the Upper Dresden Pool, which is proposed for a higher use with more restrictive water quality standards, has the Illinois EPA considered the effect of ambient water conditions that would continue to be authorized upstream and whether this may result in upstream dischargers causing violations of the more restrictive water quality standards that apply immediately downstream of the Brandon Pool?

G. §303.230 Aquatic Life A Use Designation

1. In its Statement of Reasons, the Illinois EPA states that this aquatic life use designation is created specifically for just a portion of the CAWS. Is it the Agency's position that there are no other waters in of Illinois that can be reasonably expected to share the same characteristics as the subject portions of the CAWS?

2. Does this create a precedent that going forward, the use classification system in Illinois will be a "waterbody by waterbody" process with new use designations created for each one?

3. Did the Illinois EPA consider the alternative of describing this proposed use classification more generally, such as "Aquatic Life Use A," rather than being tied specifically to the CAWS, so that if in the future other waterbodies are equally suited to this use designation they may simply be so designated under this then existing use?

4. What is the intended meaning of "aquatic-life populations" as used in the Aquatic Life Use A proposed regulation? Is it intended to exclude a few fish of a given species that are insufficient to qualify as a population?

VI. QHEI/IBI DATA

A. QHEI/IBI - Aquatic Life Use Designations - "Analysis of Physical Habitat Quality and Limitations to Waterways in the Chicago Area" Edward T. Rankin, Center for Applied Bioassessment and Biocriteria (Attachment R)

1. Mr. Rankin suggests that all or most of the CSSC be classified as Limited Resource Water. Does the Agency agree this is the Ohio EPA's lowest use classification for aquatic life?

2. For the Upper Dresden Pool area of the Lower Des Plaines, Mr. Rankin notes that habitat was good in the Brandon tailwater area (QHEI = 69.5), but comments that this site "may not be typical of the downstream reaches." Does the Agency agree that the Brandon tailwater area is not typical of the Upper Dresden Pool habitat quality?

3. The sediments in the Brandon tailwater area have been identified as being both contaminated and acutely toxic. This effectively negates the advantages of good habitat scores. How are the contaminated sediments in the Upper Dresden Pool, including the tailwater area, being considered by the Illinois EPA in evaluating the availability of good habitat?

4. With respect to the Brandon tailwater area, Mr. Rankin also states in his report (Attachment R) that "the isolation of this site (among impounded reaches) could influence the potential of that site." Does the Agency agree that the isolation of the Brandon tailwater area reduces its potential as available good habitat for aquatic life in the Upper Dresden Pool?

5. What percentage of the total area/volume of the Upper Dresden Pool does the Brandon tailwater occupy?

    a) Do the tailwater areas experience the same temperature regime as the other portions of the Upper Dresden Pool?

    b) How many fish would you expect or estimate the Brandon tailwater area of the Upper Dresden Pool to support?

6. Isn't it true that overall habitat quality in Brandon and Lockport pools is poor and only marginally better in Upper Dresden, which is the conclusion Mr. Rankin reached?

7. Mr. Rankin recommends that the Upper Dresden Pool's use classification should be "Modified Warm Water Habitat (MWH) – Impounded," using the Ohio EPA's use classification system

nomenclature. Does the Illinois EPA agree that Mr. Rankin concluded that the Upper Dresden Pool did not have the capability of attaining the CWA Aquatic Life Uses?

8. Mr. Rankin also states that "the physical patterns in these watersheds are very strong and will have a predominant influence on the types of assemblages one might expect." Does the Illinois EPA agree with Mr. Rankin's statement?

9. Why didn't the Illinois EPA incorporate the QHEI and/or numerical ranges, that it relies on in its Statement of Reasons to identify when a waterbody does or does not attain the CWA's Aquatic Life goal, into the aquatic life use designation language of the proposed rules?

B. Aquatic Life Use Designations – Appendix Table 1, 2006 QHEI (Attachment S)

1. On p. 14 of Sulski's Pre-Filed Testimony, it is stated that the Upper Dresden Pool is "capable of maintaining a biological condition that minimally meets the CWA's aquatic life goal." What does "minimally meets" mean in this context?

2. It appears that the Illinois EPA is relying on the fact that QHEI scores for the Upper Dresden Pool range as high as 80 to conclude that Upper Dresden Pool is "capable of maintaining a biological condition that minimally meets the Clean Water Act's aquatic life goal." Is this correct?

3. Is the Illinois EPA relying on the information contained in Attachment S to support its statement that the QHEI scores for the Upper Dresden Pool range as high as 80?

4. Is Attachment S the only source of technical data that supports the Illinois EPA's statement that the QHEI scores in Upper Dresden Island Pool range as high as 80, which indicates excellent biological potential?

5. Is it correct that neither the 2004 studies reported in the Rankin/CABB Report in Attachment R identified QHEI scores higher than 67 for the Upper Dresden Pool?

6. The QHEI scores in Attachment S are significantly higher than the 2004 Rankin/CABB Report's QHEI scores (Attachment R) and other QHEI scores collected in previous QHEI surveys on the Lower Des Plaines River which did not identify QHEI scores in the Upper Dresden Pool higher than 67 (versus the Attachment S QHEI scores of as high as 80). Given these inconsistencies,

describe what the Illinois EPA has done to confirm the reliability and accuracy of the information contained in Attachment S?

7. Does the Illinois EPA know what caused the QHEI scores in Attachment S to be so much higher than in the prior 2003-2004 surveys of the Lower Des Plaines?

8. The "Appendix Table 1" that makes up "Attachment S" appears to be part of a report but the report itself has not been filed as an attachment to the Illinois EPA's Statement of Reasons. Midwest Generation requested a copy of the report, and any raw data on which it is based, from the Illinois EPA shortly after the Statement of Reasons was filed with the IPCB and has still not received it. Will the Agency produce a copy of the subject report to which this Appendix is a part?

9. The Appendix Table 1 contains only summaries of the underlying data collected during this survey. Will the Agency produce a copy of the raw data on which these summaries are based?

10. What individuals conducted the survey work contained in Attachment S? Please name and describe their prior experience in conducting such surveys in the Des Plaines River?

11. From the limited information contained in Attachment S it is not possible to identify the geographic location of the sampling locations from which this data was collected and the data generally conflicts with prior IBI scores for the Upper Dresden Island Pool. Will the Illinois EPA provide information or a map showing the specific locations of these sampling locations so that it can be determined where this data was allegedly collected?

12. How were the QHEI survey locations chosen?

13. Are the QHEI survey locations proportionately representative of the types of habitat in the Upper Dresden Pool area?

14. What procedures were followed to ensure that the sampling locations were not biased and were fairly representative of the habitat conditions in the Upper Dresden Island Pool?

15. What were the persons performing this survey told was the intended purpose of it?

16. Several survey locations have rather high (>70) QHEI scores. Are these sites representative of the majority of habitat or do they represent small pockets of good habitat (e.g., the Brandon tailwater)?

17. How much good (>60 QHEI) habitat is there in each of the subject areas involved in this rule-making, particularly in the Upper Dresden Pool (e.g., 10%, 20%, 30%, etc.)?

18. The QHEI considers substrate in terms of size composition (e.g., silt vs. sand vs. cobble) but does not take into account whether the sediment present may be toxic. Has it been determined whether any of the areas that received QHEI scores >60 with apparently good habitat are in fact unusable as good aquatic habitat because of legacy pollutants in sediments?

19. What quality assurance and quality control procedures were followed to collect the underlying data that is summarized in Attachment S?

20. Were "vouchers" of the fish identified in this survey retained so that the identification of the fish species reported in Attachment S can be independently reviewed and its accuracy confirmed?

21. With regard to the fish results for the Des Plaines River contained in this Appendix Table 1,beginning at p. 28, there are several fish species identified that appear questionable for the Des Plaines River, such as silver shiner, blacknose shiner, highfin carpsucker, black redhorse, and brown bullhead. What processes were used to ensure that these species were not misidentified?

22. For approximately 50% of the fish samples on which the IBI scores in Attachment S are based, it appears the emerald shiner is included as a "simple lithophile" when the Ohio EPA no longer considers it to be a simple lithophile. Depending on the sample/station, this error results in IBI scores being either 2 or 4 points higher than they should be. Does the Illinois EPA agree that the treatment of the emerald shiner as a simple lithophile results in overstating the IBI scores for many of the samples and stations including in Attachment S?

23. It also appears that for the fish results included in Attachment S, round goby and oriental weatherfish are included in the species count metric when they clearly should be excluded as exotics. Does the Illinois EPA agree?

24. If the QHEI scores for the Upper Dresden Island Pool ranged from 45 to 67, would the Illinois EPA still conclude that those scores support a finding that the Upper Dresden Island Pool is capable of maintaining a biological condition that minimally meets the CWA's aquatic life goal? If yes, explain the underlying reasons for your answer.

25. At p. 14 of the Sulski Pre-Filed Testimony, it is noted that the Ohio Boatable Index and the Illinois EPA Fish Index of Biological Integrity scores are generally 20, suggesting that the existing aquatic life is not achieving its expected biological potential. Please explain why.

26. How do the many chemical and physical causes of non- to partial attainment identified by the Illinois EPA in their 305(b) report contribute to these low IBI scores? How are the contributions of these fish stressors being separated from temperature as a stressor?

27. The U.S. EPA is currently re-evaluating their ammonia criteria, as it has been found to be nonprotective of freshwater mussels and snails. The proposed criteria maximum concentration would be 1.75 and 2.50 mg/L total ammonia as N at pH 8 (currently at 5.62 mg/L). Criteria continuous concentration estimates range from 0.3 to 1.0 mg/L. Ammonia has been identified as a major stressor in this system. What is the Agency doing to correct this problem?

C. QHEI/IBI Data - CAWS and Brandon Pool Aquatic Life Use B Waters

1. On p. 17 of the Sulski Pre-Filed Testimony, it is stated that the "[QHEI] scores in the CAWS and Brandon Pool Aquatic Life Use B waters generally are below 40 and IBI scores generally are below 22, which are to be expected in waters with very poor to poor habitat attributes. Identify the source or attachments in which this QHEI data is contained.

2. On pp. 11-12 of the Twait Pre-Filed Testimony, it is stated that white sucker was added to the list of Representative Aquatic Species (RAS) for the CAWS and Brandon Pool Aquatic Life Use B waters "[b]ased on the fact that white sucker is present in certain waters." Identify the waters referenced in this testimony and the data on which this statement is based.

VII. Effluent and Waterway Management Controls (R. Sulski Pre-Filed Testimony p. 18)

1. Regarding the statement that "[t]he UAAs found that attainable uses were in some cases not achievable without overcoming dissolved oxygen, temperature and bacteria limitations" (R. Sulski at p. 18), what "cases" are being referred to here?

2. Does the Illinois EPA contend that an attainable use for the CSSC is not attainable solely because of temperature? If so, identify the use not being attained due to temperature and the basis, including any supporting technical and scientific data, for the statement that temperature alone is preventing any such use from being attained.

3. Does the Illinois EPA contend that an attainable use for the Upper Dresden Pool is not attainable solely because of temperature? If so, identify the use not being attained due to temperature and the basis, including any supporting technical and scientific data, for the statement that temperature alone is preventing any such use from being attained.

4. How will effluent cooling mitigate and overcome the other constraints in the CSSC identified by Illinois EPA such as flow alteration, contaminated sediment, lack of adequate good to excellent habitat, CSOs and urban non-point source run-off into the CSSC and Upper Dresden Pool?

5. Describe the expected improvements to the "limitations" caused by temperature that will occur in the CSSC based on requiring "effluent cooling."

6. Describe the expected improvements to any "limitations" caused by temperature that will occur in the Upper Dresden Pool based on requiring "effluent cooling."

7. At p. 18 of the Sulski Pre-Filed Testimony, it is stated that "[t]emperature constraints could be overcome through additional effluent cooling at the five Midwest Generation electrical generating stations." Explain how much additional cooling is needed and how it will overcome the temperature constraints.

8. Since this human dominated system is largely in non- to partial attainment of its uses due to the presence of a minimum of 31 key stressors with at least 17 source classes, it is essential that a watershed management plan be implemented that logically addresses the dominant stressors first. Does the Agency have such a plan? If so, how will the 31 stressors identified in their 305(b) be reduced?

VIII. Aquatic Invasive Species Barrier

1. In the Statement of Reasons at p. 50, the Illinois EPA describes the "aquatic invasive species dispersal barrier" installed in the CSSC at Romeoville as follows: "The barrier involves applying an electrical charge directly to the water at a rate intended to prevent any fish from passing alive." While the statement notes the intent is to prevent fish from passing alive, does the Illinois EPA know from those responsible for the installation and operation of the barrier whether the barrier does effectively prevent all fish from passing alive?

2. Did the Illinois EPA study what the potential effect(s) may be of upgrading the use designations and changing the water quality in the CSSC/LDP on the effort to prevent aquatic invasive species from passing through the CSSC in either direction? And if so, what study was done and what conclusions were drawn?

IX. Contaminated Sediments

1. On p. 67 of the Statement of Reasons, the Illinois EPA notes that it appears barge traffic which suspends the sediments in the waterways contributes to causing exceedances of the chromium chronic water quality standard. Did the Agency review the effect of sediment resuspension on aquatic life in the waterway?

2. With respect to the proposed maintenance of the §302.403 narrative standard for unnatural sludges even though the existing conditions in the waterway violate this standard due to the presence of contaminated sediments, on p. 55 of the Statement of Reasons, the Agency states it intends to apply this standard to "prevent additional accumulations of sediment."

   a) Please define "unnatural sludge or bottom deposits" and clarify the sources of such materials.

   b) Please explain in greater detail how this application of the unnatural sludges standards will be applied? Also, how does the language of §302.403 clearly express this stated limitation to the scope of its applicability?

3. On p. 55 of the Statement of Reason, the Illinois EPA states that "historic sediment pollution presents an attainability concern for some types of aquatic life in these waters." What is meant by the term "attainability concern"? What "types" of aquatic life are expected to be affected by contaminated sediments?

4. Contaminated sediments adversely affect benthic and fish communities directly and indirectly, and contaminate fish eating birds, wildlife, and humans. This effect is continuous and is amplified when bedded sediments are resuspended due to high flows and navigational traffic. Does the Agency believe that intolerant fish species can survive and reproduce in a system such as this? If so, please provide a scientific rationale.

5. Upstream sources of chemical inputs (e.g., wastewater treatment effluents, CSOs, urban runoff, agricultural runoff) will continue to contaminate new sediments that enter this system into the future. How will these source contributions be reduced to promote healthy aquatic life conditions?

6. On p. 55 of the Statement of Reasons, it also states "[i]t is anticipated that the sediment conditions in these waters will continue to gradually improve over time as will the water chemistry impacts from these historic sediments." What is the technical/scientific basis for this conclusion? Has the Agency conducted any sediment studies or modeling to support this conclusion? If so, please describe any such studies or modeling conducted.

X. Proposed Thermal Water Quality Standards

A. Background Questions Regarding the MBI/CABB 2005 Report (Attachment GG to Statement of Reasons)

1. In regard to the report by Midwest Biodiversity Institute (MBI) and Center for Applied Bioassessment and Biocriteria (CABB), titled *Temperature Criteria Options for the Lower Des Plaines River* (October 11, 2005), (hereinafter "MBI/CABB 2005 Report"), the Illinois EPA states at p. 81 of the Statement of Reasons that "U.S. EPA Region 5 and Illinois EPA requested this study to develop technical support and temperature criteria options for Lower Des Plaines River."

a) Explain the role of the U.S. EPA Region 5 in the request for this study.

b) If the report was based on the Lower Des Plaines River, how did the Agency use the conclusions and options presented in this report to develop temperature standards for the CAWS, as stated at p. 81 of the Statement of Reasons?

2. What steps did the Agency take to ensure that the MBI/CABB 2005 Report was consistent with the 1985 U.S. EPA Guidance* for developing water quality criteria, particularly the level of protection and priority for field data?

* U.S. EPA (United States Environmental Protection Agency). 1985. Guidelines for deriving numerical national water quality criteria for the protection of aquatic organisms and their uses. PB85-227049. Washington, DC.

3. Does the Illinois EPA know what portion or percentage of the fish species database on which the MBI/CABB 2005 Report recommendations are based consists of unreviewed data?

4. Did either the Illinois EPA or the U.S. EPA Region 5 have the MBI/CABB 2005 Report peer reviewed or take any other steps to address quality assurance issues relating to the report?

5. Is it correct that after the MBI/CABB 2005 Report was completed, there was no meeting of the stakeholders group for the LDP held to review and discuss the report?

B. Thermal Standards Development

1. On p. 2 of the Twait Pre-Filed Testimony, it is stated that he "interpreted" the thermal information Chris Yoder provided and "translated" that information into the proposed thermal water quality standards.

   a) Did this "interpretation" and "translation" include any changes that were intended to address Yoder's statement on p. 7 of the MBI/CABB 2005 Report that "the model output will propagate a degree of uncertainty, which can be considered in the eventual derivation and application of the temperature criteria." If so, please explain the changes that were made to the Yoder model output to address the "degree of uncertainty" in the model output?

   b) As noted at p. 3 of the MBI/CABB 2005 Report, "the steady or regular increases in test temperature inherent to the methodologies [used] do not reflect environmental reality." Did the Agency's interpretation of the thermal information provided by Yoder result in any changes to his recommended thermal criteria in order to "reflect environmental reality"? If so, please explain the changes that were made to "reflect environmental reality"?

   b) Was any review of Mr. Twait's interpretation and translation of the Yoder fish species data performed by a recognized expert in such matters?

2. On p. 12 of the Twait Pre-Filed Testimony, it is stated that the 8 species RAS list was expanded by adding the white sucker to this list. Please provide the Illinois EPA's justification for adding the white sucker to the RAS list and identify who proposed its addition.

3. On p. 12 of the Twait Pre-Filed Testimony, it is stated that the Illinois EPA determined that the 27 species RAS list identified by Chris Yoder for his "Modified Use" classification was an appropriate basis on which to derive the thermal water quality standards for the Upper Dresden Pool. Doesn't the use of only

these 27 species that are based on a "Modified Use" classification show that the available habitat in the Upper Dresden Pool for aquatic life is more limited than for a full aquatic life use designation such as "General Use"?

a) Why does the Illinois EPA believe that thermal water quality standards that are more stringent than the General Use thermal water quality standard is appropriate for a habitat-limited fish community?

4. On p. 12 of the Twait Pre-Filed Testimony, it is stated that U.S. EPA Region V requested that the stonecat fish species be added to the RAS list for the Upper Dresden Pool. Did Region V explain why and/or provide any technical justification for this request?

C. Seasonal Ambient Temperature Data

1. On p. 83 of the Statement of Reasons and p. 13 of the Twait Pre-Filed Testimony, it is stated that the "[c]riteria for non-summer periods are derived to maintain seasonal norms and cycles of increasing and decreasing temperatures." Explain what the Agency means by the terms "seasonal norms" and "cycles of increasing and decreasing temperatures."

2. Explain how the proposed thermal water quality standards maintain seasonal norms and cycles of increasing and decreasing temperatures.

3. To what extent, if, at all, has the Illinois EPA considered whether the temperatures it has proposed for "maintaining seasonal norms and cycles" necessarily reflect the thermal prerequisites of the aquatic species that inhabit, or that it anticipates will inhabit, CAWS and the Upper Dresden Pool?

4. Explain whether the Illinois EPA's approach to the non-summer period thermal water quality standards is the same as the approach suggested by Yoder for deriving such standards and if it differs, explain why the Agency selected this different approach to deriving the non-summer thermal standards?

5. On p. 83 of the Statement of Reasons and p. 13 of the Twait Pre-Filed Testimony, it is stated that "[t]he monitoring location at Route 83 on CSSC was used as the 'background' location because it was not directly influence by thermal sources such as cooling water or Lake Michigan and was believed to be representative of 'background' temperatures." Explain how the Agency defines "background" as used in this quotation and as applied to the CSSC and LDP?

6. On p. 13 of the Twait Pre-Filed Testimony, it is stated that: "Because the source water of the CAWS is composed of the MWRDGC wastewater treatment plant effluents, the temperatures of these waters can be expected to exceed other measures of background or ambient temperature at certain times of the year. Consequently, the Agency decided to use the effluent temperature from the MWRDGC's Northside, Calumet and Stickney facilities as the background temperature instead of using temperatures at the Route 83 Chicago Sanitary and Ship Canal station during periods of the non-summer months when the effluent temperature was higher than the background temperature. These periods were January, February, October 1-15, November and December." (See also Statement of Reasons at p. 83)

   a) For purposes of setting thermal water quality standards, what is the role or purpose of "background temperatures"?

   b) How can wastewater treatment plant effluent be considered "background" temperature for a waterway?

   c) As stated at p. 13 of the Twait Pre-Filed Testimony, the use of the MWRDGC effluent temperature data as background constituted an "alteration" to the recommendations in Yoder's temperature report made by the Illinois EPA. Is it correct that the reason this alteration was made is as stated at p. 14 of Twait's Pre-Filed Testimony, namely that using Yoder's recommendations for how to derive the thermal water quality standards would have resulted in standards that were lower than the temperature of the MWRDGC effluents and thus "would have required installation of cooling towers or other treatment technology to reduce the temperature of these effluents"?

   d) Is it correct to state that the alteration to the Yoder approach to deriving thermal water quality standards resulted in an accommodation to the MWRDGC so that it would not incur the economic cost of having to comply with the non-summer thermal water quality standards? If so, what economic analysis if any did the Illinois EPA perform and did it request that the MWRDGC submit any such economic impact cost analysis?

   e) Explain the underlying rationale of the Illinois EPA's decision to set the thermal water quality standards based on the goal of avoiding cooling costs for a particular discharger.

7. On p. 83 of the Statement of Reasons, and at p. 14 of the Twait Pre-Filed Testimony, it is stated that the Agency "used the 75th percentile as the monthly average to ensure that the seasonal norms are preserved in the system." Explain how using the 75th percentile as the monthly average ensures that the seasonal norms are preserved. What is the scientific basis for the 75th percentile? Why not use the 100th percentile?

8. Were either the concepts of the use of the Route 83 CSSC sampling station or the use of the 75th percentile as the monthly average presented and discussed within the various UAA stakeholder groups meeting (i.e., Lower Des Plaines Pilot Stakeholder workgroup, Lower Des Plaines UAA Biological Subcommittee, CAWS Stakeholders Advisory Committee)?

9. Has the Illinois EPA reviewed the ambient water temperatures for the past few years to determine what the ambient water temperatures typically are in comparison to the proposed thermal standards for those dischargers who are located downstream of the MWRDGC plants? Based on any such review, is the ambient temperature of the waterway typically at or near the proposed non-summer thermal water quality standards?

10. When the ambient temperature of the waterway is at or near the thermal water quality standards, does this indicate that the downstream dischargers will likely need to cool the water withdrawn from the waterway before discharging it back to the waterway after any industrial use?

11. Impervious surfaces (e.g., streets, parking lots, roof tops) greatly increase the temperature of surface water runoff during summer periods. Is this contribution being considered as part of "background"? If this is adversely affecting receiving water biota, how can this be considered background? What steps are being taking by upstream municipalities and the IEPA to reduce this adverse effect of urban runoff?

D. Proposed "Period Average" and "Daily Maximum" Elements of the Proposed Thermal Standards

1. On p. 83 of the Statement of Reasons and p. 14 of the Twait Pre-Filed Testimony, the Illinois EPA states that "[t]he daily maximum of the summer months was preserved for the entire year to ensure that no acute lethal temperatures are present, rather than using the 98th percentile of ambient temperature values for the non-summer months or some other statistical method as suggested by Chris Yoder."

a) Is the Illinois EPA saying that Yoder's recommended methods would not have ensured that no acute lethal temperatures are present in the water waterway and if so, explain the basis for this conclusion?

b) If the Agency had followed Yoder's recommendation of using the 98th percentile of ambient temperature values for the non-summer months, would it have resulted in requiring the MWRDGC to cool its effluent?

c) How does a daily maximum standard derived for the summer months ensure that no acute lethal temperatures are present during the winter months?

2. Why is it necessary to have period averages during the non-summer months when the summer daily maximum temperature is to be maintained in the winter months as well?

3. At p. 14 of the Twait Pre-Filed Testimony, it is stated that "the chronic (or sub-lethal) impacts are protected through the period average." Identify the chronic impacts data on which the period average limits for the non-summer months are based.

4. What is the justification for proposing a "period average" thermal standard that covers a period of 15 days during parts of the year and 30 days during other parts of the year?

5. How will compliance with the period average standard be determined? In other words, will it be the average temperature determined from all samples taken during the subject period and if so, how many samples at a minimum will be required?

6. Why are the non-summer period average proposed thermal standards identical among the three different proposed use classifications Aquatic Life A, B and Upper Dresden Pool when the expected resident aquatic species to be protected are different among the three proposed uses?

7. Why is the January Period Average (54.6°F) so much lower than the December Period Average (59.9°F)?

8. Was the "Period Average" concept presented and discussed within the various UAA stakeholder groups meeting (i.e., Lower Des Plaines Pilot Stakeholder workgroup, Lower Des Plaines UAA Biological Subcommittee, CAWS Stakeholders Advisory Committee)?

9. Is the proposed "Daily Maximum" thermal standard an instantaneous limit or a daily average limit?

10. If the proposed "Daily Maximum" thermal standard is an instantaneous limit, how is a discharger supposed to calculate the 2% excursion hours proposed in the thermal water quality standards?

E. Proposed §302.408(a): 2% Excursion Hours and 2°C Extent of Excursion Provisions

1. What is the basis for the selection of a 2% excursion hours provision in the thermal water quality standards versus the existing 5% excursion hours provision, particularly for the proposed lower use classification waters such as Aquatic Life B? (Scott Twait Pre-Filed Testimony at p. 15)

2. How does one compute the 2% excursion hour's allotment as applied to the period average water quality standard?

3. What is the basis for the 2°C limit on the degree of excursion over the thermal water quality standard? (Scott Twait Pre-Filed Testimony p. 15)

4. Does the 2°C limit on the degree of excursion over the thermal water quality standard apply to both the Period Average and the Daily Maximum?

F. Comparison of Proposed Thermal Water Quality Standards to Existing General Use Thermal Water Quality Standards

1. On p. 86 of the Statement of Reasons and p. 14 of the Twait Pre-Filed Testimony, it is stated that "[t]he proposed thermal water quality standards are more stringent than the current General Use standards for the months April through November, especially when considering the period average." If the proposed use designation for the Upper Dresden Pool is lower than the General Use designation, what is the rationale for proposing thermal standards for the Upper Dresden Pool that are more restrictive than the current General Use thermal standards?

2. Does the Agency believe that the current General Use thermal water quality standards are not adequately protective of full aquatic life use?

   a) If so, does the Agency intend to follow the approach to deriving thermal standards used in this rule-making to revise the General Use thermal water quality standards?

b) If so, what species or life stages does it believe are not protected, and why?

c) What changes, in terms of the types or species or number of organisms, does the Illinois EPA expect to occur if its proposed standards are adopted?

3. On p. 3 of the Sulski Pre-Filed Testimony, there are references to numerous stressors in the subject waterway, including "legacy" contaminants, and it is noted that the system must support other critical functions such as urban drainage, flood control and navigation. On p. 8, Mr. Sulski states that the Illinois EPA "recognized reduced biotic integrity due to impoundment" in the Upper Dresden Pool. Given all of these constraints and stressors and the lower use classification proposed for the Upper Dresden Pool, why does the Illinois EPA believe that thermal water quality standards that are more restrictive than the current General Use Standards is appropriate for the Upper Dresden Pool?

4. On p. 86 of the Statement of Reasons and p. 14 of the Twait Pre-Filed testimony, it is stated that in comparing the proposed thermal water quality standards to the existing General Use water quality standards that the proposed standards for the December through March time period are "approximately equivalent" to the existing General Use thermal standards. However, given that the existing General Use thermal standards provide for a 60° F standard versus the proposed standards January and February 54.3° and 53.6° F standards, respectively, is it truly accurate to say that a difference of more than 5°F is "approximately equivalent"?

G. Comparison of Proposed Aquatic Life Use A Thermal Water Quality Standards to Proposed Upper Dresden Thermal Water Quality Standards

1. At p. 82 of the Statement of Reasons, the Illinois EPA states that for Aquatic Life Use A waters, 8 RAS (Representative Aquatic Species) plus white sucker were used to determine the summer thermal standards whereas for the Upper Dresden Pool, whereas for the Upper Dresden Island Pool waters, the option of 27 RAS "modified use" species were used to derive the thermal standards. However, even given this significant difference in the number of aquatic species used to derive these two proposed sets of thermal standards, the proposed thermal standards are identical for these two different use designations.

a) Explain how this is scientifically justified given the differences in the expected presence of aquatic life between these two aquatic life use designations?

b) Please explain how the resulting absence of any difference in the thermal standards derived for what is a limited use classification versus a use that is described as either meeting or almost meeting the full aquatic life use goals of the CWA supports the approach used to derive the proposed thermal water quality standards for the CAW and LDP waterways?

H. Thermal Rule Development Process

1. At p. 15 of the Twait Pre-Filed Testimony, it states: "Developing the Agency's proposal to the Board for thermal water quality standards was one of the most challenging aspects of the rule development process." Explain why this was the case.

2. At p. 15 of the Twait Pre-Filed Testimony, it states "there will likely be additional information developed in the Record of this proceeding that the Board will have to consider in making a final decision." Explain the basis for this statement and expectation for additional information.

XI. Technical Feasibility and Economic Justification of Proposed Temperature Water Quality Standards

A. Technical Feasibility

1. At p. 99 of its Statement of Reasons, the Illinois EPA states: "With regard to temperature water quality standards, the proposed rulemaking will require Midwest Generation to control the temperature of their effluent by installing cooling towers and/or instituting closed-cycle cooling or some combination of open and closed-cycle cooling at five of their facilities: Crawford, Fisk, Will County and both Joliet facilities. Cooling towers and closed-cycle cooling are also widely used and accepted treatment technologies that are clearly technologically feasible. Various factors will impact which technology will be more appropriate for each facility." (Similar factual statements are also contained at p. 19 of the Sulski Pre-Filed Testimony)

a) Describe the technical feasibility review that the Illinois EPA conducted on the Midwest Generation facilities, including the review of such factors as available space, conflicts with existing infrastructure, sensitivity of the area to fogging, and other facility and environmental factors.

b) Did the Illinois EPA conclude that it is technically feasible for each of the Midwest Generation facilities to comply with the proposed temperature water quality standards?

c) What are the "various factors" referenced by the Illinois EPA that will impact which technology will be more appropriate for each Midwest Generation facility?

2. In assessing technological feasibility, to what extent has the Illinois EPA relied upon the statements made in Attachment A at 1-22, which states: "[i]n the early 1970's, cooling towers were not common and were expensive. Today, cooling technology using forced and natural draft is commonly used by and mandatory for many power plants on rivers that have a similar size as those located on the Des Plaines River, e.g., plants operated by the Tennessee Valley Authority or by Wisconsin Energies on the Wisconsin River and Kenosha, WI"?

   a) To what specific plants and waterbodies is the Attachment referring? Please provide details.

   b) Were any of the plants to which the Attachment refers required to retrofit closed-cycle cooling, or was closed-cycle cooling part of the original design?

3. At p. 99 of its Statement of Reasons, the Illinois EPA states: "In particular, Midwest Generation will have to study the best way to provide cooling at its smaller, older facilities where the availability of additional land may determine how much cooling capacity can be installed."

   a) Which Midwest Generation facilities is the Illinois EPA referring to as the "smaller, older" Midwest Generation facilities?

   b) Has the Illinois EPA made any determination as to whether it is technically feasible for Midwest Generation to install sufficient cooling capacity at these facilities, and if so, what is that determination and the basis on which it was made?

4. At p. 99 of its Statement of Reasons, the Illinois EPA states: "As the Board is already aware, Midwest Generation is currently considering whether to close its Will County, Crawford and Fisk facilities. (See Attachment RR)"

   a) What facts is this statement based on?

   b) Please explain the Agency's intent in including this statement in its Statement of Reasons, including an explanation of how the statement is relevant to the issue of the technical feasibility of the proposed rules?

5. At p. 99 of its Statement of Reasons, the Illinois EPA states: "Ultimately, if these studies lead Midwest Generation to conclude that it is technically infeasible (or economically unreasonable) to install additional cooling capacity at these facilities, Section 316 of the Clean Water Act allows Midwest Generation to petition for relief from these requirements."

   a) Is it Illinois EPA's position, as this statement suggests that Section 316(a) authorizes a variance from otherwise applicable water quality standards where the state determines that achieving those standards is technically infeasible or economically unreasonable?

   b) If so, has Illinois EPA discussed its interpretation of Section 316(a) with U.S. EPA, and does U.S. EPA agree? If so, please provide any available documentation of U.S. EPA's position.

   c) If Midwest Generation were to seek a variance pursuant to Section 316(a), what standard would apply?

      (i) How does that standard differ from the standard the Illinois EPA applied in developing the proposed aquatic life uses and standards?

      (ii) What new information would Midwest Generation have to collect and supply, if any?

      (iii) What additional proceedings would be required, how long would they take, and what administrative burdens would they impose on the Illinois EPA, the Board, and the Company?

      (iv) While any variance request is pending, what requirements would apply to Midwest Generation, and what costs or other burdens would those impose?

6. Is it correct that nonpoint sources of temperature increases (e.g., urban runoff) will not be regulated under these proposed rules?

7. In the Illinois EPA's Statement of Reasons discussion of the technical feasibility of the temperature water quality standards, it identifies only the Midwest Generation facilities. Did the Illinois EPA conclude that no other dischargers would be required to control the temperature of their effluent in order to comply with the proposed temperature standards and if so, what was the basis of this conclusion?

B. Economic Justification

1. At Section V.C. of the Statement of Reasons (p. 99), the Illinois EPA states: "Regarding the cost of technology required to comply with the temperature standards of this proposed rulemaking, Midwest Generation has provided the Agency with only one statement of the estimated cost of the technology needed to control the temperature of their effluent at all five of their facilities in the affected waterways (Crawford, Fisk, Will County, and Joliet 9 and 29 facilities)."

   a) With respect to the "only one [MWGen] statement of estimated cost submitted to the Illinois EPA," is the Agency referring to: (i) the April 26, 2004 Thermal Compliance Cost Study Report for the Lower Des Plaines River that Midwest Generation submitted to the Agency, or (ii) the Economic Impact Analysis for MWGen's Chicago Area Waterway Power Generating Stations provided to the Agency on January 3, 2005, or (iii) the economic information presented by MWGen in its PowerPoint presentation during the public meetings on March 20 and 22, 2007?

2. Is it correct to state that the Illinois EPA requested that Midwest Generation submit the economic reports referenced above, that the Agency did not provide Midwest Generation with any proposed thermal standards on which to base its economic information?

3. Please clarify whether Illinois EPA contends that it requested economic information from Midwest Generation that was not provided to it?

4. Did the Illinois EPA provide any comments or suggest Midwest Generation provide additional information to supplement the economic statement it submitted?

5. Did the Illinois EPA review the Midwest Generation economic reports submitted to the Agency and, if so, what if anything did it conclude regarding the economic reasonableness of the cost of compliance by Midwest Generation with the proposed temperature water quality standards?

6. Sulski states at p. 20 of his Pre-Filed Testimony, "[o]nly minimal information on economic impacts was provided by Midwest Generation." What is the basis for the characterization of the Midwest Generation information as "only minimal"?

7. What additional economic information does either the Illinois EPA or Mr. Sulski believe Midwest Generation could have but did not submit?

8. Does the information contained in the Midwest Generation economic statement constitute the only economic information concerning the estimated cost of technology to control effluent temperatures that the Illinois EPA obtained or reviewed in connection with its preparation of the proposed rules? If not, what other such economic information did the Illinois EPA obtain and/or review?

XII. MWGen's Thermal Alternatives Standard

1. In August 2007, Midwest Generation submitted an Alternative Thermal Standards proposal to the Illinois EPA that is based on a biological methodology employed by EA Engineering using extensive, actual fish studies performed over several recent years in the Upper Dresden Pool. Please identify who at Illinois EPA reviewed the Midwest Generation alternative proposal and supporting methodology.

   a) Provide an explanation of why the Illinois EPA decided not to accept or in any way rely on the biological methodology using actual stream data proposed by MWGen for deriving proposed thermal water quality standards for the Upper Dresden Pool.

   b) Does the Illinois EPA agree that the fish data on which the biological methodology is based is an extensive database or, alternatively, data which the Agency should consider?

   c) Does the Illinois EPA agree that the fish data on which the biological methodology is based is reliable data?

2. Please compare and contrast the Illinois EPA recommended standards and the MWGen proposed standards in the context of EPA's 1985 guidance for water quality criteria development.

3. Please explain the Illinois EPA's justification for encouraging biological monitoring of waterbodies affected by anthropogenic discharges if the field data are not accepted for use in establishing water temperature criteria and standards?

4. At p. 15 of Twait's Pre-Filed Testimony, it is acknowledged that "fish can tolerate short-term elevations in temperature." Do the twenty or so years of fish data collected for the Upper Dresden Pool by ComEd and MWGen support this finding?

a) How does the Illinois EPA's approach to deriving thermal water quality standards recognize or incorporate this principle?

b) Does the Illinois EPA agree that the methodology proposed by MWGen for deriving thermal water quality standards does take this principle into account because it is based on actual fish data collected in the Upper Dresden Pool?

Respectfully submitted,

MIDWEST GENERATION, L.L.C.

By: _____
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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

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

MIDWEST GENERATION'S QUESTIONS FOR THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY WITNESS CHRIS O. YODER

Midwest Generation, L.L.C. ("Midwest Generation"), by and through its attorneys, Franzetti Law Firm P.C. and Hunton & Williams, submits the following questions based upon the testimony submitted by the Illinois Environmental Protection Agency ("Agency" or "Illinois EPA") for Chris O. Yoder. Midwest Generation is separately filing questions based upon the testimony submitted by the Illinois EPA for Roy Smogor, Rob Sulski and Scott Twait in this rule-making proceeding.

Midwest Generation's questions are organized in an outline format under topical headings based on issues raised by the pre-filed testimony of Mr. Yoder and its attachments. Those attachments include the report entitled "Temperature Criteria Option for the Lower Des Plaines River" (Nov. 23, 2005) prepared by the Midwest Biodiversity Institute ("MBI") and the Center for Applied Bioassessment and Biocriteria ("CABB") (hereinafter referred to as the "MBI/CABB 2005 Report").

The questions highlight the significant issues raised by Mr. Yoder's use of literature data and his ranking of such data under what is called a "Fish Temperature Model" to derive recommended thermal criteria. This approach results in overly stringent, proposed thermal water quality standards for the Chicago Sanitary and Ship

Canal ("CSSC"), Brandon Pool and the Upper Dresden Pool, without reliance upon the many years of stream survey and fish species data that have been submitted to the Agency for this waterway. Midwest Generation's questions are necessarily extensive because the hearing will be the first opportunity to pose questions to Mr. Yoder concerning the thermal criteria he recommended to the Illinois EPA and which were largely adopted by the Illinois EPA in its Proposed Rules.

Midwest Generation requests that the Mr. Yoder provide answers specific to each question posed. Midwest Generation further requests that the Hearing Office allow follow-up questioning to be posed based on the answers provided.

QUESTIONS

I. General Background Issues

A. Professional Background

1. What is the primary source or sources of MBI's funding?

2. Other than your employment with the Indiana Department of Health, the Ohio EPA and MBI, have you been employed anywhere else?

3. When you have provided expert witness testimony in proceedings, as described on p. 2 of the Pre-Filed Testimony, on whose behalf have you provided such testimony?

4. For what other states have you prepared proposed thermal standards or made recommendations with respect to thermal standards?

5. Have you conducted any fish studies on the Chicago Sanitary and Ship Canal or on waterbodies that are similar to the Chicago Sanitary and Ship Canal? Please describe who requested those studies, when and where they were conducted, and identify any written study reports prepared. With respect to fish studies on waters other than the CSSC, please explain the basis for your opinion that those waters are similar to the CSSC.

6. Have you conducted any fish studies on the Lower Des Plaines River or on waterbodies that are similar to the Lower Des Plaines River? Please describe who requested those studies, when and where they were conducted, and identify any written study reports prepared. With respect to fish studies on waters other than the Lower Des Plaines River, please explain the basis for your opinion that such waters are similar to the Lower Des Plaines River.

7. How many peer-reviewed, scientific journal papers have you published on the subject of the development of thermal water quality standards? Please list them.

8. How many invited oral presentations have you given at national/international scientific meetings on the subject of the development of thermal water quality standards? Please list them.

B. Participation in LDP UAA

1. With reference to p. 3 of the Pre-Filed Testimony, explain how you came to be retained by the United States Environmental Protection Agency ("U.S. EPA") Region V to provide technical assistance related to the LDP UAA and what kind of technical assistance you were asked to provide?

2. How many meetings of the LDP UAA stakeholder workgroup did you attend?

3. Did you present your report to the Illinois EPA on the derivation of thermal water quality standards, which is being relied on here, at a meeting of the LDP UAA stakeholder workgroup and respond to any questions on your report?

4. Did you present and discuss your Fish Temperature Model approach to deriving thermal water quality standards at any meetings of the various UAA stakeholder groups (i.e., Lower Des Plaines Pilot Stakeholder workgroup, Lower Des Plaines UAA Biological Subcommittee, CAWS Stakeholders Advisory Committee)?

II. Fish Temperature Model

A. General Background

1. Has your temperature "model" ever been field validated? If so, please provide details of the process.

2. In the Illinois EPA Statement of Reasons at p. 81, it is noted that the approach to deriving thermal standards was used by the Ohio

EPA in 1978 and by the Ohio River Valley Water Sanitation Commission in 1984. Where has this approach been used in the twenty-three years since?

3. When this approach was used in the cited 1978 and 1984 matters, were there extensive stream data, such as those existing here for the Lower Des Plaines River, available for use instead of the published literature data approach that was used?

4. In retaining the services of the MBI/CABB for the development of temperature criteria, did the Illinois EPA discuss and/or review with the MBI/CABB the alternative approach of using and relying on the extensive, available stream habitat and biological data for the Lower Des Plaines River to derive thermal water quality standards? If so, why was an approach that utilized the available stream data rejected?

5. Did either the Illinois EPA or the U.S. EPA Region 5 provide the MBI/CABB with any of the stream data, which include fish studies that have been collected in the Lower Des Plaines River for over twenty years, to use in developing your recommendations for thermal criteria?

6. Have you reviewed the August 2007 EA Engineering Report entitled "Development of Biologically Based Thermal Limits for the Lower Des Plaines River" that was prepared for Midwest Generation and submitted to the Illinois EPA?

7. Referring to the Ohio EPA stream assessment program that is used to designate use classifications for Ohio waterbodies, is it correct that the Ohio program emphasizes the use of field biology?

8. Is it correct to say that, in the Ohio stream assessment system, attainment of a use is achieved only when certain biological endpoints are met, rather than just relying on attainment of chemical water quality criteria?

9. In Attachment R, Edward Rankin of the CABB writes: "The ultimate arbiter used in the designation of aquatic life uses under the Ohio system is biological data." Do you agree that it makes sense to use a similar approach to assessing thermal conditions in situations where sufficient field data are available? If so, what would you view as sufficient field data to warrant use of that approach?

10. Are you a proponent of using field-collected biological data to assess aquatic community impairment?

11. Do many variables (e.g., habitat, sediment quality, water quality, flow) collectively determine the nature and quality of aquatic communities?

12. Is it true that the aquatic community integrates (i.e., responds to) these collective inputs?

13. How does one reliably separate the effects of the various inputs that affect aquatic communities?

14. Is the report you prepared for U.S. EPA and the Illinois EPA consistent with 1985 U.S. EPA "Guidelines for deriving numerical national water quality criteria for the protection of aquatic organisms and their uses" (PB85-227049 Washington, DC) ("1985 U.S. EPA Guidelines")? Please compare and contrast your method with EPA's guidance, including introductory sections.

B. Use Designation Decisions

1. On p. 4 of the Pre-Filed Testimony, it is stated that the Temperature Criteria Options report was developed prior to and independent of the use designation determinations proposed in this rule-making and that you did not participate in the use designation process. Is it correct then that the thermal criteria you developed in your report were not developed based on the proposed uses described in the Illinois EPA's Proposed Rules?

2. Is it correct that you were not asked to determine whether your proposed thermal criteria were protective of the aquatic life use designation proposed for the Upper Dresden Pool and the CAWS?

3. On p. 4 of your Pre-Filed Testimony, it is stated: "I was not asked to propose specific thermal criteria for either the Lower Des Plaines River or the Chicago Area Waterway System."

   a) What were you asked to do?

4. How did you decide on the 3 categories or classifications into which your report groups the temperature criteria options you considered, namely General Use, Modified Use and Secondary Contact/Indigenous Aquatic Life Use ("Secondary Contact Use")?

5. Was your "General Use" category the same as the existing Illinois General Use classification?

6. What would be the habitat requirements for the species that comprise the aquatic community you have identified as

representative of the General Use you considered for the Lower Des Plaines River?

7. In your 2005 report to the U.S. EPA and the Illinois EPA, within the General Use Category, is it correct that you provided several thermal criteria options depending on which species were included or excluded?

   a) Why did you add or remove certain species within these various options?

   b) What species did you add, and what difference did it make to the daily maximum values you calculated?

   c) Would the differences between the daily maximum values calculated with and without those additional species suggest that the Fish Temperature Model results are fairly sensitive to the choice of RAS? If you agree, would this indicate that it is important to ensure that the RAS selected are in fact appropriate for the waterbody in question?

   d) Given the significant effect that data for a single species can make, would you agree that it is important to ensure that the data, and especially data for species that appear to be more sensitive, are adequate and reliable?.

8. Referring to p. 9 of the Pre-Filed Testimony, it is stated that "[t]he modified use designation in my report is designed to represent impounded portions of rivers similar to the Des Plaines River and included 27 species."

   a) Explain the meaning of the term "impounded portions" of rivers.

   b) Does the Upper Dresden Pool fall within the intended meaning of the term "impounded portion" and if so why?

   c) What other portions of the Lower Des Plaines River at issue in this rule-making do you believe fall within the intended meaning of an "impounded portion" of a river?

   d) How does this compare to Ohio's Use Classification known as "Modified, Impounded" waters? Please describe the Ohio category, its application and rationale.

9. If you had been asked to propose specific thermal criteria for the Lower Des Plaines River, would your approach differ from the

approach used in your report and if so, how? If not, why would it be the same?

10. In Ohio, do intolerant fish species typically thrive (reproduce) in Modified, Impounded use waterways?

11. What would be the habitat requirements for the species that comprise the aquatic community you have identified as representative of the Modified Use you considered for the Lower Des Plaines River?

12. Describe the type of waterbody to which your "Secondary Contact" category was intended to apply.

13. Do you have any opinion as to what portions of the LDP or the CAWS fit your category of "Secondary Contact" waters?

C. Characteristics of Fish Temperature Model

1. Explain how the approach you used to derive thermal standards constitutes a "model," as it is termed, given that it does not appear to employ any modeling, mathematical equations and other characteristics typical of the usual meaning of a technical model.

2. Rather than referring to it as a "model", would it be more accurate to describe it as a ranking of fish species from most to least sensitive based on certain thermal endpoints?

3. Under this ranking approach, is it correct that once the fish species have been ranked for a particular endpoint, such as upper lethal temperature, the proposed thermal standard is taken from the temperature that the literature data predict will be protective of the fish species deemed the "most sensitive," that is at the top of the ranking list?

4. Under this ranking approach, is it only the literature data for the top-ranked species that are used to determine the numeric temperature limit that becomes the proposed water quality standard? Explain whether, and if so how, this approach is consistent with the 1985 U.S. EPA Guidelines.

5. If so, then is it also fair to say that, for purposes of calculating the daily maximum and period average thermal water quality standard, none of the literature values collected for species other than the top-ranked species is taken into account?

6. How does the species-specific ranking of temperature tolerance under your model address other factors such as population, community, and/or food-web interactions?

7. In the MBI/CABB 2005 Report at p.7, you describe your approach to developing thermal standards as being "naturally limited by the extant thermal tolerance database" and you note that the model output will "propagate a degree of uncertainty." The Report goes on to state that this uncertainty in the recommended thermal criteria "can be considered in the eventual in the eventual derivation and application of the temperature criteria." Is it correct that you left it to the Illinois EPA to determine how these uncertainties in the application of the "model output" predictions and the literature based rankings should be addressed in its review and revisions to your recommended thermal criteria?

   a) Did you in any way guide or discuss with the Illinois EPA how it should address these uncertainties?

D. Updated Fish Temperature Model Database

1. At p. 6 of your Pre-filed Testimony, you state that MBI updated the thermal effects data "for ORSANCO and included over 200 new and suitable thermal effects studies mostly produced after 1978."

   a) What do you mean by "suitable" thermal effects studies?

   b) What criteria did you use to determine suitability?

   c) For these over 200 new studies, what QA/QC procedures were employed to determine whether the study results were reliable and credible?

   d) Of these over 200 new studies, is it correct that only those that contained specific thermal tolerance endpoints used in the "Fish Temperature Model" were incorporated into the database used to develop the thermal criteria options included in the 2005 LDP Report? And if so, how many of these new studies were included?

E. Thermal Endpoints - Lethality

1. On p. 5 of the 2005 LDP Report, it is stated that "[w]hen upper thermal endpoints were available for more than one method the MBI (2005) study selected lethal endpoints based on the following (most preferred first)...", after which the report lists the ChTM, UILT, and CTM methods, in that order. This statement suggests

that, where multiple studies using different methods were available, some were "selected" and some were not. In contrast, however, on p. 7 of the Pre-Filed Testimony, it is stated that "[t]he combined lethality input parameter (relying on ChTM, UILT and CTM with a safety factor) was used in calculating the short-term and long-term survival outputs of the Fish Temperature Model."

a) Where more than one study for a given endpoint existed, did MBI use all of the studies or only some?

b) If MBI used only selected data, please describe the selection process in greater detail.

c) If MBI used only selected data, how many studies were not used?

d) To the extent MBI derived its "combined lethality input parameter" using multiple studies employing the same method, please explain how that procedure was followed to combine those study data.

e) To the extent MBI used multiple studies employing differing methods to derive a "combined lethality input parameter," please describe how that parameter was derived and how MBI accounted for the significant differences among those methodologies and the range of endpoints they produce

2. Referring to p. 7 of the Yoder Pre-Filed Testimony, there is a discussion of the three thermal endpoints that measure lethality – UILT, ChTM and CTM).

a) Please describe the ChTM method, including the meaning of the phrase "a slow heating method."

b) Explain what conditions are deemed "natural conditions."

3. Why is the ChTM the "best available laboratory method for simulating natural conditions"?

a) Has your conclusion that the ChTM slow heating method is the best available laboratory method for simulating natural conditions been field validated?

4. If the ChTM laboratory method is the best in simulating natural conditions, does your approach give any preference or priority to using ChTM laboratory data (rather than CTM or UILT data) to

identify the "combined lethality input parameter" used in your ranking of species? If so, explain how or if not, explain why not?

a) On p. 7, it is also stated that "this methodology is new and there are very few studies available." Identify which, if any, of the data endpoints on which the thermal criteria for the LDP are based on the use of ChTM method?

5. Referring to p. 7 of the Yoder Pre-Filed Testimony, it is stated that "UILT is still the primary method relied on because it is viewed as being more realistic than the CTM and numerous studies exist."

a) Please describe the UILT method.

b) What makes the UILT laboratory method "more realistic than" the CTM laboratory method?

6. With respect to the CTM method of testing

a) Describe the "rapid heating method" that is used in CTM laboratory tests.

b) If the CTM laboratory method "does not approximate natural conditions and produces unrealistically high lethality endpoints" (as stated at p. 7 of the Pre-Filed Testimony), why are such laboratory results included in the database used to derive thermal water quality standards?

c) On p. 7 of your Pre-Filed Testimony, you indicate that you applied a safety factor of 2°C to the CTM laboratory method tests. Does this mean that each time your database contained a CTM-derived data value, you lowered that value by a 2°C "safety factor"?

d) What is the scientific basis for the selection of a safety factor of 2° C to adjust the CTM laboratory method thermal results and how do you know that such a safety factor is appropriate "to address the inherent weakness of this rapid heating method in mimicking nature" as stated at p. 7 of the Pre-Filed Testimony? Provide scientific citations supporting the application of this safety factor.

e) Did you use or consider using any of the published conversion methods for relating CTM values to UILT values? If you used any such methods, please identify them. If you considered but did not use any such methods, please explain why you chose not to use them.

f) Given your testimony that "much of the new data" was based on CTM studies, identify which, if any, of the data endpoints on which the thermal criteria for the LDP are based are from these CTM studies? Describe the process for data selection and exclusion of CTM studies, including any QA/QC criteria used.

g) Provide scientific citations supporting your positions on the relative merits of the UILT and CTM.

F. Thermal Endpoints – Sub-lethal or Chronic Effects

1. Referring to the bottom of p. 7 of your Pre-Filed Testimony, describe what is being measured in the following four endpoints: Optimum temperature, Final Preferendum, Upper Avoidance Temperature and MWAT for Growth.

a) Is the MWAT for Growth a calculated value based on the optimum temperature and the upper lethal temperature?

b) What do you mean when you state "[t]hese [four endpoints] were condensed into three input parameters for the Fish Temperature Model by combining Optimum temperature and Final Preferendum into a single input parameter"?

c) Explain how the "condensing" of the Optimum temperature and Final Preferendum into a single input parameter is done and why it is done.

G. Fish Temperature Model Database

1. Is it correct that the "Fish Temperature Model database" has been created as a general database of the various thermal endpoints data for various fish species, and that it is not specific to any particular watershed or waterbody?

2. Does the step of identifying the representative aquatic species for the subject waterbody begin the process for developing thermal criteria for a specific waterbody?

3. Referring to p. 8 of the Pre-Filed Testimony, explain the basis for your finding "that intolerant species are under-represented in the thermal database, which is dominated by tolerant and intermediately tolerant species."

4. What is the basis for judging species as tolerant, intermediately tolerant or intolerant?

5. With respect to these intolerant species, explain what you mean by the statement (on p. 8) that available data frequently include "single studies (as opposed to multiple studies for the tolerant species) that do not always produce all of the thermal endpoints in the Fish Temperature Model."

6. When there were multiple studies of the same species and endpoints, please explain how you selected the numerical value to place in your database.

H. Extrapolation of Thermal Endpoints (Attachment 3 to Pre-Filed Testimony)

1. Within the 2005 LDP Report on the derivation of thermal water quality standards, various thermal endpoints are ranked in several categories, such as upper lethal temperature, avoidance temperature, and growth temperature. Describe and explain the procedure followed to extrapolate a value for a given thermal endpoint when literature values are not available for a given species.

2. Where in the 2005 LDP Report can the extrapolation formulae be found?

3. To the extent such extrapolations are based on calculated relationships among the endpoint data for a given species,

   a) When did you review the literature to establish the relationships among the various endpoints?

   b) When you updated your database and added the 200 new studies referred to on p. 6 of your Pre-filed Testimony, did you recalculate those relationships or take other steps to ensure that the previous extrapolations were still accurate? If so, please describe what you did. If not, please explain why you did not.

4. If data on only one endpoint for a given species was available, were all three of the remaining endpoints used in the Fish Temperature Model developed by extrapolation from the single available endpoint?

5. Is there any way a reviewer of your report to the Illinois EPA can determine from the information it contains which values in your report are actual literature data and which are estimated based on your extrapolation procedure?

6. In any of the sets of RAS used in your report to Illinois EPA, are the endpoint values for the top three most sensitive species extrapolated?

7. When your Fish Temperature Model database was expanded, did you check to see how the new literature data that were added to the database compared to the old extrapolated endpoints those new data replaced?

I. Representative Aquatic Species

1. In footnote 2 to Table 1 of the 2005 LDP Report, you state that the species noted were "collected in the UAA study segment between 1994-2002." To what data does this statement refer? Can they be found in your report or some other report you have submitted?

2. On pp. 8 and 9 of your Pre-Filed Testimony, you describe how you selected the species you considered representative of each of the three use categories you considered.

   a) However, it appears that for your "General Use" RAS list you included all species on which temperature data were available. If this is correct, please explain how your approach to the General Use RAS list is consistent with the statement in your testimony?

   b) If for the General Use RAS list you did select only species that were representative of the waterbody, provide examples of species you excluded as being not representative.

3. On p. 9 of the Pre-Filed testimony, it is stated that "[o]nly the General and Modified RAS lists relied on sampled data from the Lower Des Plaines; the Secondary Contact RAS is a general collection of typically tolerant species that are usually found in highly degraded and modified waters."

   a) Please explain your reference to "sampled data" and identify the source of those data.

   b) To the extent you did not rely on "sampled data" in selecting the Secondary Contact RAS, what sources of information did you rely on to select those RAS?

4. Referring to p. 9 of the Pre-Filed Testimony, it is stated that "the Secondary Contact RAS is a general collection of typically tolerant species that are usually found in highly degraded and modified waters." What do you mean by "highly degraded"?

5. Referring to the last sentence at the bottom of p. 9 of the Pre-Filed Testimony, it is stated that "[t]he tables I provided on pp. 13 and 14 of my report illustrate temperatures that should not be exceeded in order to protect a given percentage of the species in each RAS grouping for the four primary thermal endpoints." What is the meaning of the terms "protect," "given percentage" and "species" referenced in this sentence?

6. Near the bottom of p. 9 of your Pre-filed Testimony, you refer to "potential" RAS lists. Explain what you mean by "potential".

J. QA/QC

1. For the proposed thermal water quality standards that are based on the literature data for the most sensitive species in the ranking approach, how was the validity of that data confirmed?

   a) Identify the person(s), if any, who reviewed any or all of the technical literature from which these thermal values were taken to determine if they were acceptable.

   b) What criteria did the reviewer(s) use to determine acceptability?

2. In the 1985 U.S. EPA Guidelines, data compilers are advised to check their data sets to determine if the data are acceptable. What was done here to check the literature data used, to determine if those data are acceptable?

3. For example, on p. 21 of the 1985 U.S. EPA Guidelines, it states that data should be used only if it contains "enough supporting data to indicate that acceptable test procedures were used and that the results are probably reliable." How do you know that acceptable test procedures were used in the studies that were the basis of your ranking approach?

4. Also on p. 21 of the 1985 U.S. EPA Guidelines, it states that questionable data "should not be used." What steps, if any, were taken to ensure that questionable data were not used?

5. What Quality Assurance Program Plan ("QAPP"), which is a mechanism that the U.S. EPA uses to ensure that only quality data is used, was applied here to the literature data that were used in 2005 LDP Report?

6. A typical QAPP includes the requirement that secondary data (i.e., data not gathered by the principal investigator) be reviewed for accuracy. Was a review of secondary data contained in the

database underlying the 2005 LDP Report undertaken? If so, please describe that review.

7. In all of the U.S. EPA's Water Quality Criteria documents, each lethal endpoint is listed separately in a table and a column in that table provides the data source from which that value was taken. Is this type of information provided in the 2005 LDP Report and, if so, please explain where?

8. Would the information presented in your 2005 LDP Report be sufficient to allow a reviewer to conduct an independent evaluation of some or all of the thermal endpoints your have presented? How could someone do that using the information provided? For example, how could a reviewer check the UILT values you report for white sucker, bluegill, or any of the 50 or so species you provide data on?

9. On p. 3 of the Temperature Options Report that you prepared for Region V and IEPA you state "The original literature source was examined for relevancy, originality, and completeness as much as was possible prior to accepting the data in the master database." What does the phrase "as much as was possible" mean?

   a) In this same paragraph, you go on to note that "The acceptance of 'extrapolated' (i.e., without a direct review of the original publication) citations was done for some of the more comprehensive thermal effects compendia". Does this mean that most of the data were accepted without reviewing them?

   b) In this same paragraph you say "A notation was made about the extrapolated citation of such references." Please identify where in the report you prepared or the appendices to that report these notations can be found.

10. For the proposed Upper Dresden Pool Aquatic Life Use thermal standards, is it correct that the thermal values on which the "period average" limits are based were taken from literature data on the white sucker species?

    a) Given that it is only one species that determines the numerical water quality standard value, isn't it very important to determine the validity of the literature data that was the basis for the particular endpoint used in the ranking to derive the thermal water quality standard?

    b) What technical paper did the white sucker upper lethal value that is being used to determine the proposed thermal

standards for the Upper Dresden Pool Aquatic Life Use come from?

c) Did you review that paper?

11. With respect to the number of individuals that should be tested in order to produce a valid test result,

a) Do you agree that every species has a sensitivity range/distribution to stressors? If you disagree, please provide your rationale.

b) If you agree, does this suggest that a valid endpoint cannot be derived using only one or two individuals? If you disagree, please provide your rationale.

c) If you agree, would you also agree that an endpoint should not be determined using only one or more tests involving one or two individual organisms? If you disagree, please provide your rationale.

d) Does the MBI/CABB database contain any such data?

e) On p. 7 of your Pre-Filed Testimony, you state that "much of the new data that we found were based on CTM studies." Is it correct that a CTM value, albeit not an accurate one, can be obtained based on testing only one fish?

(i) Please quantify, either by number of data points or percentage of the new data based on CTM Studies, how many of the new data are based on testing only one, or even on only a few (say 5 or fewer) individuals of a species?

(ii) Please do the same for the original dataset.

12. Did you ever conduct any sensitivity analysis to evaluate the level and significance of the many sources of uncertainty in your model?

K. Temperature Criteria Options (begins at p. 10 of Pre-Filed Testimony)

1. How did you decide what period of time the "period average" temperature criteria should cover? Please provide any supporting scientific citations and rationale.

2. With respect to the term "daily maxima," is this intended to be a temperature level that is never exceeded at any time in the waterbody or is it intended as a daily average value? Please provide any supporting scientific citations and rationale.

3. On p. 10 of the Pre-Filed Testimony, it is stated that "daily maxima should ensure 100% short term survival of all representative species and also be consistent with the observed historical ambient temperature record."

   a) Does the reference to 100% short term survival of all representative species mean that the criteria is intended to protect the most sensitive species 100% of the time? Please provide any supporting scientific citations for this approach to setting thermal water quality standards.

   b) What do you mean by your statement that the daily maxima were set to be "consistent with the historical ambient temperature record"? How was the historical ambient temperature record determined for this purpose?

   c) Is it important to use an historical ambient temperature that reflects local conditions? What would you consider "local"? How would you go about assessing the validity of a record made at a site that is many miles away?

4. With regard to the calculation of daily maximums and period averages for the non-summer months, why is your recommended basis the use of background temperatures rather than using the same approach as was used for the summer months? Please provide any supporting scientific citations for your recommendation.

5. For the non-summer months' temperatures, what is the scientific basis for your suggestion that the geometric mean of the background temperatures should be used for the period average temperature criteria?

6. For the non-summer months' temperatures, what is the scientific basis for your suggestion that the 98^{th} percentile should be used for the daily maximum temperature criteria?

7. Have your suggestions for setting non-summer months thermal criteria been used by any other states and if so, where?

8. If the concept for setting non-summer month thermal criteria is to maintain the normal seasonal cycles, is the "normal seasonal cycle" what the waterbody ambient data has shown to be "normal" for that waterbody? If not, define "normal" as used in this context.

9. Explain how "maintaining the normal seasonal cycles will protect essential functions such as growth, gametogeneisis and spawning"

as stated on p. 11 of the Pre-Filed Testimony, including what "gametogeneisis" means.

10. If a waterbody does not provide the necessary habitat or conditions for spawning, should that affect how the summer and non-summer month thermal criteria are derived?

11. Are there any biological data assessments or syntheses that suggest that "maintaining the normal seasonal cycle" requires the achievement of "background" ambient temperatures, uninfluenced by man?

12. On p. 12 of your Pre-Filed Testimony, it is stated that occasional thermal exceedances "are inevitable and may not necessarily result in a biologically impaired use. A conclusion that I have reached is that temperature excursions should be evaluated with direct biological measures in a receiving waterbody that is representative of reference or least impacted conditions."

    a) Is the second sentence intended to follow from the first?

    b) Are you suggesting that, to evaluate the biological significance of exceedances of the temperature standards you have recommended, the Illinois EPA would need to evaluate the effects of the exceedance of those temperatures at reference sites?

    c) If so, how would this be done? Do you consider it practical? Is it part of your recommendation?

    d) If not, please explain further what you mean by these statements.

L. UAA Waterway Stressors and Constraints

1. How does the thermal endpoint ranking approach used here to identify thermal criteria options account for the presence or absence of adequate habitat?

2. How does the thermal endpoint ranking approach used here to identify thermal criteria options account for the presence or absence of other stressors (i.e., ammonia, metals, nonpolar organics, emerging contaminants, endocrine disruptors, pathogens) for fish in the subject waterbody?

3. How are the fish populations and communities in the Upper Dresden Pool and the CSSC likely affected by the several sources

and causes of non- to partial attainment identified by the IEPA in their most recent 305(b) report?

4. How are the fish populations and communities in the Upper Dresden Pool and the CSSC likely affected by elevated levels of mercury and PCBs?

5. Recent data suggest that fish populations have been adversely affected by chronic exposure to low levels of endocrine disruptors, commonly found in waterways receiving municipal effluents, such as this one. How does such exposure to low levels of endocrine disruptors likely affect "intolerant" fish species that are included in the proposed use designation for the Upper Dresden Pool?

6. Highly contaminated and toxic sediments have been documented to exist throughout this waterway, including in the few desirable habitats of the Upper Dresden Pool. It is well documented that sediments such as these adversely affect fish communities and pose both an ecosystem and human health risk. How does exposure to contaminated and/or toxic sediments potentially affect "intolerant" fish species that are included in the proposed use designation for the Upper Dresden Pool?

7. At the bottom of p. 11 of the Pre-Filed Testimony, it is stated that: "Selecting a temperature representative of background temperatures in this system is complicated by the physically and thermally altered characteristics of the Upper Illinois and the Chicago Area Waterway Systems."

   a) Explain what you mean by "thermally altered characteristics."

   b) Describe what the complications are that referenced in this testimony.

   c) Did you take into account these complications in your suggestions for how to develop the summer and non-summer month temperature criteria? If so, explain how.

M. Acclimation

1. Explain the relationship between acclimation temperature and the resultant upper lethal temperature during toxicity tests?

   a) Is it true that until the so-called ultimate upper incipient lethal temperature is reached, the upper lethal temperature varies positively with the acclimation temperature?

b) On p. 7 of your Pre-Filed Testimony, you indicate that the upper lethal temperatures in your literature studies database are based on fish acclimation temperatures of 25-30° C. Did you include this caveat because of the relationship between acclimation temperature and the resultant UILT?

c) Did you similarly restrict (i.e., to studies based on fish acclimation temperatures of 25-30°C) the upper lethal endpoints in the dataset you prepared for the ORSANCO project? If not, why not?

d) Was the upper lethal temperature for white sucker based on acclimation temperatures of 25-30° C?

e) Did you determine the acclimation temperatures used in the laboratory studies for any of the other species in your database? If the laboratory study did not use an acclimation temperature of 25-30° C, did you exclude the laboratory study results from your database?

f) Is it true that the upper lethal temperatures for a number of species (e.g., silver lamprey, stonecat, and redear sunfish) in your database were based on testing winter-acclimated fish that had been acclimated at <5° C?

g) Is it correct that the upper lethal values in your database for these and other species were based on testing only one or two specimens?

N. Thermal Avoidance

1. Is it correct that the thermal water quality standard values derived in the MBI/CABB Report were derived exclusively from laboratory data?

2. Do you agree that in lab testing, the test organisms have nowhere to go to escape potentially harmful or lethal temperatures?

3. Do you agree that in a waterway, fish can detect high temperatures and will avoid them provided thermal refugia are available?

4. Is it correct that the derivation process used here does not account for this thermal avoidance behavior in fish?

5. Is thermal avoidance by fish a generally accepted phenomenon?

O. Absence of Early Life Stages – CAWS Aquatic Life Use B Waters

1. On p. 60 of the Statement of Reasons, the Illinois EPA states that the CAWS Aquatic Life Use B waters "do not have the potential to consistently support early life stages of fish" and that these waters "can attain only suboptimal growth conditions for fish." Did the ranking approach on which the CAWS Aquatic Life use B thermal standards are based take these findings concerning the absence of early life stages into account in deriving the proposed water quality standards and if so how?

2. Does this mean that fish are unlikely to reproduce in this system and are present due to migration from refugia and stocking?

P. 2003-2006 ORSANCO Project Report (Attachment 3 to Yoder Pre-Filed Testimony)

1. In your final report to ORSANCO dated 27 January 2006, the seasonal average limit of 75.2° F and the daily maximum limit of 78.8° F that you presented in Table 12 were based on the upper lethal endpoint for logperch, correct?

2. Isn't it true that these values (75-79° F) are well below the ambient temperatures that often prevail in the Ohio River during the summer?

3. Was your recommended value based on an endpoint for logperch that, rather than being based on a lethal toxicity test, was based instead on a reproductive (chronic) endpoint?

4. Have logperch in the Ohio River been collected at temperatures above what your report suggests are the short-term and long-term lethal temperatures for logperch?

5. Is it correct that based on the difference between the recommended logperch-based Fish Temperature Model criteria and the actual ambient fish survey data for the subject waterway, you made a revised recommendation to ORSANCO for the thermal summer criteria? And was that revised recommendation based on the stream survey ambient temperature record instead of the Fish Temperature Model?

6. Your logperch data for the ORSANCO project came from the Hubbs 1961 report but our review of that report did not identify a basis for concluding that 22° C is the optimum value for logperch. Explain how you reached the conclusion that 22° C is the optimum temperature for logperch.

7. In the report you prepared for ORSANCO (Yoder et al 2006), you stated (p. 2) that most studies that you relied upon were accepted at "face value" (your term). What did you mean by at face value?

8. On p. 26 of the 2006 ORSANCO report, you state "acceptable data were then recorded in the master thermal effects database." What criteria did you use in that project to determine whether the literature data was "acceptable?"

9. In Table 9 of the 2006 ORSANCO Report, please explain what the numbers in the columns headed "Original Sources" and "New Literature" refer to.

10. In the ORSANCO study, you provided temperature options based on two RAS lists, a so called all-possible RAS list and a main-stem restricted RAS list. Is that correct?

    a) What is the difference between those two lists?

    b) Did you develop the species on either of those lists? If not, who did?

11. The Mainstem-Restricted List in your 27 January 2006 Report (Table 11) would result in a period average limit of 84.2° F and a daily maximum limit of 87.8° F?

    a) What species has these lethal endpoints?

    b) What is the source of these lethal endpoints?

    c) Were the upper lethal endpoints established using the CTM methodology?

    d) At what acclimation temperature did they test the subject fish species?

    e) How many fish were used in the testing or how many trials did they do with this species?

Q. Ohio - Muskingum River

1. According to Section 3745-1-07 of the Ohio Regulations, the thermal water quality standards period average for the period 16 June through 15 September is 85° F, with an allowable daily maximum of 89° F. Were these thermal water quality standards based on the same "modeling" approach you used on the ORSANCO project and have proposed here for the Lower Des Plaines River?

2. Do you agree that the Muskingum River limits of 85° F average and 89° F maximum are essentially identical to the values proposed for the Upper Dresden Pool by Illinois EPA?

   a) Describe the characteristics of the Muskingum River in comparison with the Upper Dresden Pool. Is it your opinion that these two waterbodies are substantially similar? If so, why do you believe they are similar?

Respectfully submitted,

MIDWEST GENERATION, L.L.C.

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