

BEFORE THE POLLUTION CONTROL BOARD
OF THE STATE OF ILLINOIS

IN THE MATTER OF:)

TRIENNIAL REVIEW OF WATER)
QUALITY STANDARDS FOR BORON,)
FLUORIDE AND MANGANESE;)
AMENDMENTS TO 35 ILL. ADM. CODE)
302.SUBPARTS B, C, E, F AND 303.312)

R11-18
(Rulemaking - Water)

NOTICE OF FILING

To: John T. Therriault
Clerk of the Board
Illinois Pollution Control Board
100 West Randolph
Suite 11-500
Chicago, IL 60601

Kathleen Crowley
Hearing Officer
Illinois Pollution Control Board
100 West Randolph
Suite 11-500
Chicago, IL 60601

Office of Legal Services
Illinois Department of Natural Resources
One Natural Resources Way
Springfield, IL 62702-1271

Deborah J. Williams,
Sara Terranova, Assistant Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

Andrew Armstrong,
Assistant Attorney General
Environmental Bureau
69 West Washington Street, Suite 1800
Chicago, IL 60602

Kathleen Bassi,
Amy Antonioli
Schiff Hardin, LLP
233 South Wacker Drive, Suite 6600
Chicago, IL 60606-6473

Please take notice that on June 13, 2011, I filed with the Office of the Clerk of the Illinois Pollution Control Board the attached **QUESTIONS OF THE CITY OF SPRINGFIELD, OFFICE OF PUBLIC UTILITIES, FOR THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY WITNESS BRIAN KOCH**, a copy of which is served upon you.

Respectfully submitted,

THE CITY OF SPRINGFIELD,
a municipal corporation

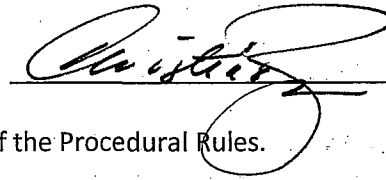
By 

One of its Attorneys

Dated: 6/13/11
Christine G. Zeman
Special Assistant Corporation Counsel
Office of Public Utilities
800 East Monroe
Springfield, Illinois 62757
(217) 789-2116, Ext. 2628
Email: christine.zeman@cwlp.com

CERTIFICATE OF SERVICE

The undersigned, an attorney, certifies that on June 13, 2011, I have filed electronically the attached **QUESTIONS OF THE CITY OF SPRINGFIELD, OFFICE OF PUBLIC UTILITIES, FOR THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY WITNESS BRIAN KOCH** upon John Therriault, Assistant Clerk, and by First Class Mail, postage prepaid, a true and correct copy to the individuals named on the foregoing Notice of Filing on June 13, 2011, from Springfield, Illinois.



This filing uses recycled paper as defined in Subpart B of the Procedural Rules.

BEFORE THE POLLUTION CONTROL BOARD
OF THE STATE OF ILLINOIS

IN THE MATTER OF:)

TRIENNIAL REVIEW OF WATER)

QUALITY STANDARDS FOR BORON,)

FLUORIDE AND MANGANESE;)

AMENDMENTS TO 35 ILL. ADM. CODE)

302.SUBPARTS B, C, E, F AND 303.312)

R11-18

(Rulemaking – Water)

QUESTIONS OF THE CITY OF SPRINGFIELD, OFFICE OF PUBLIC UTILITIES, FOR
THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY WITNESS BRIAN KOCH

The City of Springfield, Office of Public Utilities, d/b/a City Water, Light and Power ("CWLP"), by its attorney, Christine Zeman, Special Assistant Corporation Counsel, submits the following questions based upon the Proposed Amendments to 35 Ill. Adm. Code Parts 302, Subparts B, C, E and F, the Statement of Reasons and its Attachments, and the Testimony of Brian Koch submitted by the Illinois Environmental Protection Agency ("Agency" or "Illinois EPA") in this rulemaking proceeding.

CWLP's questions are organized in an outline format under topical headings based on issues raised principally by the proposed amendments to the Water Quality Standards ("WQS") for boron.

In an effort to facilitate the Agency's preparation of responses, citations to specific pages or relevant language from the Agency's Proposed Rules, Statement of Reasons and/or Witness Testimony are provided. CWLP further requests that the Hearing Officer allow follow-up questioning to be posed based on the answers provided.

QUESTIONS

I. General Witness Background

1. What role did you have in developing the Agency's Statement of Reasons?
2. The Statement of Reasons references specific Site Specific Rulemakings and Adjusted Standards, for example as to boron, beginning at page 28 – 32. Did you read each Opinion and Order of the Board cited at page 28 – 32?
3. What role did you have in developing the Agency's Attachment 1 to the Statement of Reasons, *Facts in Support of Changing Water Quality Standards for Boron, Fluoride, and Manganese*?

II. Statutory Basis and Legal Framework

A. In its Statement of Reasons at page 1, the Illinois EPA references that its proposal to revise the water quality standards (including for boron) is a culmination of the Illinois EPA's obligation to conduct a "triennial review" under the Federal Water Pollution Control Act (a/k/a "Clean Water Act").

1. Is it the position of the Illinois EPA that it is only obligated to conduct a "triennial review" of water quality standards under federal law, or also under the Illinois Environmental Protection Act?

B. In its Statement of Reasons at page 2, the Illinois EPA references that its responsibilities under Section 4 (l) of the Illinois Environmental Protection Act include "to transmit the standards adopted by the Board to the United States Environmental Protection Agency ("U.S. EPA") for approval where required by federal law. 415 ILCS 5/4(1)."

1. Does the Illinois EPA take the position that federal law requires the Board to adopt a water quality standard for boron?

2. Does the Illinois EPA take the position that state and/or federal law requires the Board to adopt both an acute and chronic water quality standard for boron?

3. On what basis did Illinois EPA determine to propose a chronic standard for boron, where one does not presently exist?

4. Did the Illinois EPA consider any other state's standards for boron in developing its proposed acute and chronic standards for boron here?

5. What other states have a boron effluent or water quality standard?

6. How does the acute and chronic standard for boron proposed by the Illinois EPA compare to the boron standards of other states?

a) For Midwest states, are there any with a chronic standard at 7.4 mg/L (or lower), as proposed by Illinois EPA here?

b) For any Midwest state with a chronic standard, if known, is the standard "Aquatic Life-Based" or based upon the U.S. EPA *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organism and Their Uses* ("the 1985 Guidelines")?

7. In its Statement of Reasons at pages 2 - 3, 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 rulemaking: "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)." For the proposed boron standards, 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) Illinois EPA states at page 2 of the *Facts in Support of Changing Water Quality Standards for Boron* (Attachment 1 of the Statement of Reasons) that treatment to remove boron in the sources identified is "non-existent" and in the Statement of Reasons at pages 25 – 26, that as to boron (and fluoride) in every site-specific water standard or adjusted standard brought before the Board, Illinois EPA concluded that no reasonable treatment exists to reduce boron in effluent. Is it now also the conclusion of the Illinois EPA that no reasonable treatment exists to reduce boron in effluent, and that boron-removal technologies are "non-existent"?

c) What additional information did the Illinois EPA review in determining the technical feasibility of reducing boron, if any? Please provide any additional information the Agency used in determining the technical feasibility of reducing boron.

III. Development of the Proposed Water Quality Standards for Boron

A. The prefiled *Testimony of Brian Koch* references that literature reviews were conducted in the development of the proposed water quality standards for boron. Did you participate in the literature review as to boron?

B. How did the Illinois EPA utilize the literature reviews in the development of the proposed boron WQS?

1. If you know, did any literature reviews suggest that a chronic limit for boron could be higher (or less stringent) than the proposed chronic boron standard of 7.4 mg/l?

2. If so, what study made such suggestion and how was that study used or considered, if at all, in the development of the proposed chronic standard for boron here?

C. U.S. EPA's 1985 Guidelines, Attachment 1, Exhibit F to the Illinois EPA's Statement of Reasons appears to discuss how to determine the appropriate averaging period at around pages 7-11 in part to take into consideration the "fluctuating concentrations that usually exist in the real world". The Guidance references developing this period in relation to the Criterion Continuous Concentration or "CCC" (at page 8) suggesting that a four-day average allows waste treatment facilities to consider the probability of an exceedence of the average into the design of the waste treatment plant (at page 11). But Illinois EPA's *Facts in Support* references that boron is not generally an issue for sewage waste treatment facilities ("...sewage treatment plant effluents generally have boron concentrations of between 0.01 and 0.05 mg/L boron") and states that treatment for boron is "non-existent" (at page 2).

1. Did the Illinois EPA determine to utilize a "four day average" ("the arithmetic average of at least four consecutive samples collected over any period of at least four days") in developing the proposed chronic standard for boron because it is already referenced in 302.208(b) or did it make a specific determination that a four-day average was appropriate for boron?

2. If it specifically determined that a four-day average is appropriate for boron, how did it make that determination (given that U.S. EPA Guidelines suggest that the four-day average is to enable the average to be considered in the design of a waste treatment plant)?

3. U.S. EPA's 1985 Guidelines also suggest (at page 10) that the four-day average is appropriate for use with the CCC. Did the Illinois EPA develop a CCC in its study of boron to support its proposed chronic standard using a four-day average?

4. U.S. EPA's Guidelines discuss exceedences of the developed standard being (in part) the result of usual or random variations in the flows of both the effluent and the receiving water, and state that "most aquatic ecosystems can probably recover from most exceedences in about three years" (at page 12), allowing for more local or site-specific criterion when adequately justified, to include site-specific "frequencies of allowed exceedences". Did the Illinois EPA include "frequencies of allowed exceedences" in developing the proposed boron WQS?

IV. Impact of Proposed Boron Standards

A. Technical Feasibility and Economic Justification

1. In both the Statement of Reasons (page 27) and the Conclusion in your prefiled Testimony, the Agency claims that its proposed standards are economically reasonable and technically feasible because the proposed standards would not "result in the need to implement treatment technologies beyond those required by the existing regulations," and because the proposed rules "do not seek to establish specific effluent standards," while still serving "to effectively protect the designated uses of all associated waters." Your Testimony references no specific facilities that these statements would not cover, but the Agency's *Facts in Support* reference that coal ash is an important source of boron, and that coal ash ponds may contain boron concentrations approaching 20 mg/L. (at page 2).

a) As to boron, did the Illinois EPA rely not only on the Board Opinions and Orders in the Site Specific Rulemakings and Adjusted Standards referenced at pages 28-32 of the Statement of Reasons to reach this conclusion, but also the records in those boron rulemaking proceedings?

b) One Adjusted Standard relied upon by the Illinois EPA is the Adjusted Standard from the boron standard, then at 302.208(e), for Sugar Creek below Spaulding Dam, due to CWLP's discharge from its coal ash ponds causing or contributing to an exceedence of the boron WQS in 1994, is that correct?

c) The Illinois EPA appears to base its conclusion that the proposed boron standards are economically reasonable and technically feasible on four classes of facilities: those that currently meet the existing boron WQS, three facilities granted Board relief that is less stringent than the proposed chronic boron standard, four facilities where Discharge Monitoring Reports demonstrate that the chronic standard will be met, and a fourth class, where the boron relief granted by the Board will still be necessary.

1) When filed, the Statement of Reasons at pages 31 - 32 identifies only the CWLP facility (and the impacted segment of Sugar Creek from Spaulding Dam to the Sewage Treatment Plant) in the fourth category "based upon its initial investigations" is that correct?

2) To the best of your knowledge and based upon any investigations of the Illinois EPA since the Statement of Reasons was filed, is CWLP still the only facility in that last category, that is, that the relief previously granted by the Board will not become moot?

3) Other than CWLP, are there any other facilities that were granted relief from the Board for boron that discharge into a 7-day, 10-year low flow stream?

d) One of the facilities identified by the Illinois EPA at page 31 of the Statement of

Reasons in the third class, that is, those whose DMRs demonstrate the relief will become moot, is the Spring Creek Sanitary Treatment Plant of the Springfield Metro Sanitary District, is that correct?

1) Did the review of the DMRs (and related permits) of the Springfield Metro Sanitary District by the Illinois EPA demonstrate that CWLP has implemented the diversion of its waste water stream to the Sanitary District's Spring Creek Plant, as proposed in R09-8?

a) In R09-8, CWLP was a joint petitioner who requested relief to enable the Spring Creek Plant to accept CWLP's pretreated industrial effluent stream from its Flue Gas Desulphurization System ("FGDS") blowdown, which went to its ash ponds, because CWLP had exceeded the boron limit approved by the Board in the Adjusted Standard when it began operating its air pollution control systems for NO_x removal in 2003. Is that generally accurate?

b) In seeking relief from the Board to enable diverting this FGD waste water stream from its ash pond and outfall in R09-8, CWLP sought to meet the 11 mg/l for Sugar Creek granted by the Board in the Adjusted Standard in 1994, just as it had before it began operating its air pollution systems for NO_x control. Is that generally accurate?

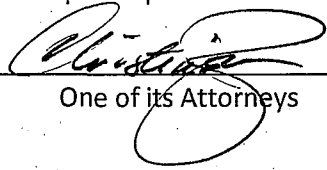
2) In the record in R09-8, CWLP included evidence addressing CWLP's boron mitigation efforts, which included the costs and effectiveness of the alternatives, including a *Boron Mitigation Options Table*. The Table (Attachment G to Petitioners' Post-Hearing Document Submittal) is attached. Do you recall reviewing this Table at any time prior to today's testimony?

2. Given that the Agency has determined that technology to reduce boron is non-existent, with CWLP's demonstration of the alternatives and costs to meet the existing boron standard in the Adjusted Standard and in R09-8, and the Agency's statement that CWLP will yet need relief from the proposed boron standard, can the Agency state that as to CWLP, the proposed boron standard is not economically reasonable or technologically feasible?

3. If not, please explain the Agency's response.

Respectfully submitted,

THE CITY OF SPRINGFIELD,
a municipal corporation

By 
One of its Attorneys

Dated: 6/13/11
Christine G. Zeman
Special Assistant Corporation Counsel
Office of Public Utilities
800 East Monroe
Springfield, Illinois 62757
(217) 789-2116, Ext. 2628
Email: christine.zeman@cwlp.com

BORON MITIGATION OPTIONS TABLE

Treatment Technology	Cost			Reason For Not Implementing	Discussion
	Present Value (\$)	Capital Cost (\$)	O&M Cost (\$)		
Brine Concentrator followed by Spray Dryer	\$22,100,000	\$8,222,000	\$798,539	Technology was attempted. See discussion included in "pilot plant" below.	CWLP entered a contract with Aquatech International Corporation to provide a Zero Liquid Discharge Brine Concentrator/Spray Dryer System in December 2005. See the discussion below for the results of this pilot plant test. Costs cited are for comparative purposes only and do not include site preparation (site grading, providing utilities, etc.) or disposal of wastes generated by the process. Present Value assumes Annual O&M Costs escalate by \$40,000/year; calculation also assumes power plant life of 30 years and an interest rate of 8 percent.
Reverse Osmosis followed by Crystallizer and Spray Dryer	\$25,600,000	\$6,120,000	\$1,118,649	Not selected for pilot plant test based on cost and operational issues with high concentrations of salts and suspended solids in the waste stream.	Reverse Osmosis technology is currently not considered to be a viable technology for this application and is no longer marketed by the vendor to remove high concentrations of boron in liquid waste streams. Costs cited are for comparative purposes only and do not include site preparation (site grading, providing utilities, etc.) or disposal of wastes generated by the process. Present Value assumes Annual O&M Costs escalate by \$56,000/year; calculation also assumes power plant life of 30 years and an interest rate of 8 percent.
Electrocoagulation (EC)	\$254,000,000	\$9,207,000	\$14,074,000	Not selected for pilot plant test based on high cost relative to low boron removal efficiencies.	Targeting boron in FGDS wastewater specifically for removal by EC is difficult because boron is known to exist in at least six pH dependent species in water. Additionally, competing reactions from other FGDS wastewater constituents was expected to dramatically lower boron removal. It was concluded that boron removal efficiency could not be predicted due to lack of verified boron removal efficiencies in high boron and high TDS waters. An on-site small scale test was performed with no success of demonstrating the removal of boron. Costs cited are for comparative purposes only and do not include site preparation (site grading, providing utilities, etc.) or disposal of wastes generated by the process. Present Value assumes Annual O&M Costs escalate by \$700,000/year; calculation also assumes power plant life of 30 years and an interest rate of 8 percent.
"Pilot Plant" Brine Concentrator/Spray Dryer System	\$104,500,000	\$40,000,000	\$3,700,000	Increased cost and uncertainty in how to dispose of solid waste generated by treatment process.	As detailed design of the Brine Concentrator/Spray Dryer system progressed, it became apparent that the FGDS blowdown water was a unique application of this technology. This relatively unique application translated into design changes and increased cost as the project progressed. The question of how to dispose of large quantities of solid waste generated was never resolved; therefore, the cost of waste disposal is not included in the referenced costs. Present Value assumes Annual O&M Costs escalate by \$185,000/year; calculation also assumes power plant life of 30 years and an interest rate of 8 percent.

Alternative Operational Modifications	Reason For Not Implementing	Discussion
Alternative Coal Supply	Economic analysis favored continued use of Illinois coal.	Studies showed that continued use of Illinois coal was the lowest cost long term solution; resulted in economic benefits for Springfield and the State of Illinois; took advantage of CWLP's experience operating and maintaining FGDS systems; as well as avoiding major plant equipment and railway modifications and concerns about handling explosive dust. See section 6.1 on pages 6-1 through 6-3 of the TSD.
Convert to Dry Ash Systems	Will not reduce boron in the wastewater generated by the air pollution control systems that are the subject of this site-specific boron standard.	Conversion to a dry ash system has been studied by CWLP; however, the particular waste stream that is the subject of this technical support document is generated by the air pollution control equipment and would not be eliminated by modifying the plant ash handling system. The new Dallman Unit 4 will include dry fly ash and bottom ash handling systems. See section 6.2 on pages 6-3 through 6-5 of the TSD.

Alternative Operational Modification	Cost			Reason For Implementing	Discussion
	Present Value (\$)	Capital Cost (\$)	O&M Cost (\$)		
Pretreatment/Discharge to SMSD	\$36,100,000	\$15,500,000	\$1,600,000	Pretreatment and Discharge to the SMSD Spring Creek Plant is proposed for implementation.	SMSD has entered into a contract with CWLP to accept the FGDS wastewater stream for a price of \$100,000/month provided that acceptance of the wastewater does not upset normal Spring Creek Plant operations. CWLP intends to treat the FGDS waste stream with conventional treatment process for solids removal prior to pumping the wastewater to the SMSD Spring Creek Plant. CWLP is also providing a chemical feed system to control odor to the SMSD plant. See section 6.4 on pages 6-13 through 6-14 of the TSD. The capital cost includes the pretreatment system and the pipeline to transfer the pretreated FGDS wastewater and chemical feed system(s) to control odor to the SMSD Spring Creek Plant. Present Value assumes a fixed monthly payment to SMSD, with other operating and maintenance costs escalating by \$10,000 per year, a pretreatment system life of 30 years and an interest rate of 8 percent.