



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
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CHICAGO, IL 60604-3590

NOV 19 2014

REPLY TO THE ATTENTION OF:
WQ-16J

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STATE OF ILLINOIS
Pollution Control Board

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

Re: Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and the Lower Des Plaines River, R08-009 SubdoCKET D

Dear Illinois Pollution Control Board:

The U.S. Environmental Protection Agency commends the Illinois Pollution Control Board (Board) for its continued work to update the water quality standards that apply to the Chicago Area Waterway System and Lower Des Plaines River. EPA is providing the enclosed comments on the Board's September 18, 2014, first notice opinion and order to assist the Board as it attempts to adopt changes that are consistent with federal requirements for water quality standards at Section 303(c) of the Clean Water Act and 40 CFR Part 131.

EPA appreciates the opportunity to provide comments to the Board. Please contact Candice Bauer of my staff, at bauer.candice@epa.gov or (312) 353-2106 if you have any questions.

Sincerely,

Tinka G. Hyde *T.G.H.*
Director, Water Division

Enclosure

cc: Marcia Willhite, IEPA

Enclosure: Specific Comments on the Subdocket D First Notice for Water Quality Standards in the Chicago Area Waterway System and Lower Des Plaines River

I. Comments on duration and frequency of water quality standards and the inclusion of minimum sampling requirements

Water quality criteria consist of three components--magnitude, duration, and frequency--which, when used together, provide the most scientific assurance that the criteria are protective of the designated use. Magnitude is the scientifically derived numeric expression of the amount of the pollutant (often expressed as a concentration value); duration is the period of time over which the magnitude is calculated; and, frequency is the number of times the pollutant may be present above the magnitude over the specified duration. EPA considers all three components of water quality criteria in reviewing new and revised water quality standards. This is done to ensure that criteria are "based on sound scientific rationale and contains sufficient parameters or constituents to protect the designated use."

The proposed revisions to 35 Ill. Admin. Code Section 302.407 address the duration and frequency components for all of the criteria included in the Illinois Pollution Control Board's (Board's) first notice proposal in an omnibus manner. Although the record is clear the chronic aquatic life criteria in the Board's first notice proposal were based upon a four-day duration period, the Board has proposed in Section 302.407(b) a duration period that could be longer than four days, proposing that the duration be for "any period of *at least* four days" (emphasis added). As EPA noted in April 28, 2014, comments to the Board on this same language, EPA questions whether such an unbounded duration is based on sound scientific rationale and would be protective of the designated use. EPA, therefore, reiterates the recommendation that we made in our prior comments, that the Board should remove "at least" from the phrase "any period of at least four days" in Section 302.407(b), so that the duration component of the chronic criteria would be "any period of four days," which would be consistent with the scientific underpinnings of the Board's proposed chronic criteria. Given that Section 302.407(b) is applicable to all of the chronic aquatic life criteria in the Board's proposal, EPA believes that this issue must be adequately addressed by the Board before EPA will be able to approve any chronic aquatic life criteria that the Board ultimately adopts.

EPA also has concerns about the Board's inclusion of minimum sampling requirements within the criteria in Sections 302.405(e)(3), 302.407(b) and (c) and 302.412(d). As EPA explained on page 6 of our April 28, 2014, comments to the Board:

Including these types of assessment provisions within Illinois water quality standards themselves, rather than in a separate, unrelated section of Illinois' administrative code, is problematic because it suggests that the criteria's applicability is dependent on whether the requisite sampling requirements have been met. Clearly, there is no scientific basis to conclude that Illinois' aquatic life uses can be protected by water quality standards that render the criteria that are designed to protect those uses ineffective simply because sampling requirements deemed to be necessary for measuring the level of pollutants in

the receiving stream have not been complied with. EPA, therefore, recommends that the Board remove minimum sampling requirements from Illinois' water quality standards.

Specifically, EPA strongly recommends that the Board make the following changes to remove the minimum sample size requirements:

- Section 302.405(e)(3) (pertaining to dissolved oxygen) should be removed in its entirety.
- In Section 302.407(b) (pertaining to chronic criteria), the phrase “of at least four consecutive” and the sentence “[t]he samples used to demonstrate attainment or lack of attainment with a CS must be collected in a manner that assures an average representative of the sampling period” should be removed.
- In Section 302.407(d) (pertaining to human health criteria), the clause “based on at least eight samples, collected in a manner representative of the sampling period,” should be removed.
- The last two sentences in both Sections 302.412(d)(2) and 302.412(d)(3) referring to attainment and sampling for ammonia should be removed.

If the Board wishes to adopt regulations with provisions such as these, which advise the public as to minimum sampling protocols that the Board believes should be followed in collecting monitoring data to assess attainment of Illinois' criteria, the Board should separate any such provisions from the criteria themselves and include them in a section of Illinois regulations other than Section 302, to eliminate any link between the criteria themselves and monitoring provisions relevant to assessing attainment of those criteria.

II. Chicago River

The Board decided in Subdocket C that the Chicago River should meet the General Use standards for aquatic life uses and thus did not list the Chicago River at Section 303.230 or 303.235 where applicable aquatic life uses for the Chicago Area Waterways System (CAWS) and Lower Des Plaines River (LDPR) are described. However, the Board's language only refers to the protection of aquatic life uses, while General Use waters (including the Chicago River) are also intended to be protected for wildlife, agricultural, industrial and aesthetic uses. EPA recommends that the Board clarify Section 303.204 to ensure adequate protection of the designated uses for the Chicago River and clarify the effective water quality criteria for the Chicago River in Sections 302.401 and 302.402.

III. Clarification of Uses and Criteria

The language in Sections 303.204, 302.401 and 302.402 describes the standards related to protection of aquatic life, but the applicable criteria in Subpart D includes aquatic life, wildlife and human health criteria. Therefore, EPA recommends that the Board ensure that aquatic life, wildlife, and human health uses and criteria are adequately recognized in the descriptions of the applicable standards at Sections 303.204, 302.401, and 302.402. Therefore, in order to address the comments regarding the Chicago River in II above and the description of applicable uses and criteria, EPA recommends that the Board revise the following sections to say:

Section 303.204 Chicago Area Waterway System and Lower Des Plaines River

The Chicago Area Waterway System and Lower Des Plaines River Waters are designated to protect for primary contact recreation, incidental contact or non-contact recreational uses (except where designated as non-recreational waters), commercial activity (including navigation and industrial water supply uses), human health, and the highest quality aquatic life and wildlife attainable, limited only by the physical condition of these waters and hydrologic modifications to these waters. Except for the Chicago River, these waters are required to meet ~~the aquatic life~~ standards contained in Section 302, Subpart D, but are not required to meet the general use standards or the public and food processing water supply standards of Section 302, Subpart B and C, except that the waters designated as Primary Contact Recreation Waters in Section 303.220 must meet the numeric water quality standard for fecal coliform bacteria applicable to protected waters in Section 302.209. Designated recreational uses and aquatic life use for each segment of the Chicago Area Waterway System and Lower Des Plaines River are identified in this Subpart. The Chicago River must meet the General Use standards, ~~for the protection of aquatic life as well as~~ including the numeric water quality standard for fecal coliform bacteria applicable to protected waters, in Section 302.209.

Section 302.401 Scope and Applicability

b) Subpart D also contains the Chicago Area Waterway System and Lower Des Plaines River water quality standards. Except for the Chicago River, these standards must be met only by waters specifically designated in Part 303. The Subpart B general use and Subpart C public and food processing water supply standards of this Part do not apply to waters described in 35 Ill. Adm. Code 303.204 as the Chicago Area Waterway System or Lower Des Plaines River and listed in 35 Ill. Adm. Code 303.220 through 303.240, except that waters designated as Primary Contact Recreation Waters in 35 Ill. Adm. Code 303.220 must meet the numeric water quality standard for bacteria applicable to protected waters in 35 Ill. Adm. Code 302.209. The Chicago River must meet the General Use standards including the numeric water quality standard for fecal coliform bacteria applicable to protected waters in 35 Ill. Adm. Code 302.209.

Section 302.402 Purpose

The Chicago Area Waterway System and Lower Des Plaines River standards shall protect primary contact, incidental contact or non-contact recreational uses (except where designated as non-recreational waters), commercial activity, including navigation and industrial water supply uses; human health, 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. The numeric and narrative standards contained in this Part will assure the protection of the aquatic life, wildlife, human health, and recreational uses of the Chicago Area Waterway System and Lower Des Plaines River as those uses are defined in 35 Ill. Adm. Code Part 301 and designated in 35 Ill. Adm. Code Part 303. Indigenous aquatic life standards are intended for the South Fork of the South Branch of the Chicago River (Bubbly Creek), which is capable of supporting an indigenous aquatic life limited only by the physical configuration of the body of water, characteristics and origin of the water and the presence of contaminants in amounts that do not exceed the water quality standards listed in Subpart D. However, the Chicago River is required

to meet the General Use standards, including the bacteria criteria applicable to protected waters, contained in 35 Ill. Adm. Code 302 Subpart B.

IV. Application of Subpart F

EPA recommends that the Board clarify Section 302.410, entitled “Substances toxic to aquatic life.” Section 302.410 should be revised to ensure that the application of Illinois’ Subpart F procedures to derive additional water quality criteria provides for protection of human health. As written, this provision could be interpreted as limiting the applicability of this provision only to substances that are harmful to aquatic life. Therefore, EPA recommends that Illinois clarify the applicability of the procedures by deleting the words “toxic to aquatic life,” which appear to qualify the remainder of the provisions. The Board should also clarify that this section applies to substances not otherwise listed in Subpart D similar to the provisions included in Subpart B. For example, Section 302.210, entitled “Other toxic substances” states, “Waters of the State shall be free from any substances or combination of substances in concentrations toxic or harmful to human health, or to animal, plant or aquatic life. *Individual chemical substances or parameters for which numeric standards are specified in this Subpart are not subject to this Section*” (emphasis added). While it is appropriate to retain the language currently present at 302.410 for Bubbly Creek, EPA recommends that separate provisions mirroring the language at 302.210 be applied to all other Chicago Area Waterways and Lower Des Plaines River waters in order to protect designated uses. One way the Board could revise the provision would be to state: “Any substance or combination of substances toxic to aquatic life not listed in Section 302.407 shall not exceed one half of the 96-hour median tolerance limit (96-hour TLM) for native fish or essential fish food organisms in the South Fork of the South Branch of the Chicago River (Bubbly Creek). All other Chicago Area Waterway System and Lower Des Plaines River waters as designated in Part 303 shall be free from any substances or combination of substances in concentrations toxic or harmful to human health, or to animal, plant or aquatic life. Individual chemical substances or parameters for which numeric standards are specified in this Subpart are not subject to this Section.”

Last, EPA recommends that the title of Section 302.410 be revised to “Other toxic substances” to recognize that these procedures are intended to protect aquatic life, wildlife, and human health.

V. Defensibility of Proposed Criteria

A. Temperature

EPA recommends that, for the reasons set forth in EPA’s April 28, 2014, comments, the Board revise the proposed temperature criteria and instead adopt Illinois EPA’s May 24, 2013, proposed temperature criteria (except as related to exceedence hours).

EPA notes that the first notice (at page 211) states, “The Board finds that the existing General Use temperature standards provide the most appropriate alternative for protecting aquatic life” for the Upper Dresden Island Pool (UDIP), CAWS Aquatic Life Use (ALU) A, and CAWS ALU B waters. However, the Board’s proposed standards are not the same as those effective in General Use waters. Specifically, the Board has not included the narrative temperature standards at Section 302.211(b), (c), and (d). Therefore, if the Board elects to adopt the numeric criteria

applicable to General Use waters for the CAWS and LDPR, the narrative temperature standards at Section 302.211(b), (c), and (d) should be included as well.

While the aforementioned comments apply to all CAWS and LDPR waters, it is particularly important that the Board adopt temperature criteria for the UDIP that are protective of the adopted designated uses consistent with 40 CFR 131.11(a)(1) and 40 CFR 131.11(b)(1).

B. Selenium

EPA recommends that the Board adopt the chronic water column total recoverable selenium criterion of 5ug/L consistent with EPA's 304(a) criteria document published in 1987 (as also explained at 62FR42160). Updating the selenium criterion consistent with EPA's 304(a) chronic criterion recommendation of 5ug/L is reasonable in this instance since: (1) the current 304(a) criterion is based upon the protection of warmwater fish (the bluegill), (2) current data suggests, as described at: <http://water.epa.gov/scitech/swguidance/standards/criteria/aqlife/selenium/upload/seleniumdraft2014.pdf>, a water column concentration of approximately 5ug/L is likely to be protective of aquatic life uses in flowing waters, and (3) current data available at the website above suggests that a chronic water column criterion value of approximately 5ug/L is likely to be protective of warmwater fish present in the CAWS and LDPR such as species in the *Lepomis* (sunfish), *Micropterus* (bass), and *Pimephales* (minnow) genera, which represent 3 of the 5 most sensitive fish genera in the chronic selenium dataset.

C. Chloride

EPA stated in our April 28, 2014, comments regarding the winter chloride site-specific criteria for the Chicago Sanitary and Ship Canal (CSSC) that, "EPA's preliminary review suggests that the deletion of *Ceriodaphnia*, *Sphaerium*, and *Lampsilis* GMAVs is not appropriate due to the fact that these species should be considered to "occur at the site" as defined in EPA's 2013 revised deletion process guidance or because they serve as necessary surrogates for other species that occur at the site. Further, EPA questions whether all appropriate new toxicity data has been added to the toxicity database used to derive the criteria." EPA also included in our April 28, 2014 comments the specific information relied upon for concluding that the proposed site-specific criteria were not defensible. However, the Board concluded (at page 192) in its first notice that CITGO "properly employed USEPA's 2013 recalculation procedures to derive scientifically defensible site-specific acute and chronic water quality criteria for chloride in the CSSC".

EPA reviewed the record for the CSSC winter chloride criteria including the prefiled testimony of J. Huff and R. Klocek, the transcript from the December 17, 2013 hearing, supplemental materials provided by CITGO on January 22, 2014, and comments filed by CITGO on April 30, 2014, and May 14, 2014. EPA continues to question whether the proposed winter chloride criteria for the CSSC are based upon a sound scientific rationale as required by 40 CFR 131.11 since the deletion procedure does not appear to have been completed in accordance with EPA guidance.

As detailed below, CITGO derived the proposed winter chloride criteria for the CSSC by deleting the toxicity data for some of the most sensitive surrogate species present in the toxicity database, which raises questions about whether the proposed winter chloride criteria for the

CSSC are protective of the species that “occur at the site.” EPA questions the deletion of toxicity data for species in the toxicity database because information suggests the species occur at the site or are necessary, consistent with EPA’s guidance, to serve as a surrogates for untested species that occur at the site. Further, EPA is unaware of information in the record that demonstrates that the criteria will ensure that downstream aquatic life uses in the Lower Des Plaines River will be protected in accordance with 40 CFR 131.10(b).

Specifically, EPA still questions deletion of the *Ceriodaphnia* GMAV from the data used for deriving the proposed CSSC wintertime criteria since *Ceriodaphnia* and other untested cladoceran genera occur at the site at other times of year (See evidence provided by EPA in our April 28, 2014, comments that cladocerans may be present in the winter, and that information documenting the absence of *Ceriodaphnia* and other untested cladoceran genera such as *Bosmina* at the site in the winter is lacking). EPA still questions deletion of the *Sphaerium* GMAV since information suggests that *Sphaerium* and/or other untested genera of fingernail clams occur at the site, and deletion of the *Lampsilis* GMAV since little information is available to document that this species or other untested species of mussels does not occur at the site. EPA still questions rejection of rotifer data since evidence suggests that rotifers are present in the waterway and information documenting their absence in winter is lacking. EPA questions use of a *Musculium* GMAV value that is not normalized to the appropriate hardness and chloride concentration. Finally, EPA questions the appropriateness of the proposed criteria because (1) the proposed chloride criteria were calculated at a hardness of 300mg/L, but information in the record suggests that the CAWS and LDPR have hardness concentrations less than or equal to 200mg/L, and (2) appropriate duration and frequency of the criteria are not included in the proposal. EPA, therefore, recommends that the Board consider each of those points in determining whether there is a sound scientific rationale for the proposed site-specific winter criteria for the CSSC and whether the proposed site-specific winter criteria are protective of designated aquatic life uses.

EPA continues to believe that the proposed 500mg/L acute chloride criterion at Section 302.407(g) is scientifically defensible. However, to the extent that the Board is considering adoption of a new Subdocket to further address the chloride criteria and attainability issues, such a proposal would be acceptable so long as the Board retains the current total dissolved solids criteria of 1500mg/L until such time that chloride criteria and/or chloride variance procedures are adopted and approved by EPA.

D. Copper

The Board has proposed adoption of a hardness-based copper criteria because it does not believe that BLM-based criteria “are workable.” However, EPA believes that adequate information is available to estimate the numeric criteria for each segment of the CAWS and LDPR using the biotic ligand model (BLM, as described in EPA’s aquatic life ambient water quality criteria – Copper 2007 Revision available at: <http://water.epa.gov/scitech/swguidance/standards/criteria/aqlife/copper/index.cfm>). As described below, analyses could be conducted using the model, available at: http://www.hydroqual.com/wr_blm.html, consistent with EPA guidance (available at the aforementioned EPA website), to derive BLM-based criteria estimates for each segment.

In order to use the BLM to derive copper criteria estimates, EPA recommends that states first compile data for each of the input parameters in a way that is representative of the water (i.e., sampling conducted over a period of at least 1 year and comprised of about 24 or more independent sampling times for each segment). Based upon EPA's initial review of available data at: <http://www.mwrd.org/irj/portal/anonymous/WQM>, it appears that bimonthly data are readily available from the Metropolitan Wastewater Reclamation District for most segments for temperature, pH, total organic carbon (that can be used to derive reasonable estimates of dissolved organic carbon, DOC, using a conversion factor), calcium, magnesium, chloride, sulfate, and alkalinity. For the remaining input parameters (i.e., percent humic acid, sulfide, potassium, and sodium), default input parameters of 10% can be used for percent humic acid, sulfide and potassium concentrations can be estimated consistent with EPA's 2007 User's Guide and Reference Manual (pgs. 4-2 through 4-4), and sodium concentrations are available in the literature (Kelly et al. 2012, Griffith 2013).

EPA recommends that the Board calculate and adopt BLM-derived criteria for each segment or revise the hardness-based copper criteria equations by applying the recalculation procedure to an updated toxicity database (e.g., as described in EPA 2007).

E. Cadmium and Dissolved Oxygen

In our April 2014 comments, EPA presented information to suggest that the cadmium criteria proposed by the Board are protective of aquatic life uses. While the Board provided an alternate rationale for the proposed criteria, EPA's April 28, 2014, comments present a sound scientific rationale for the criteria consistent with the requirements of 40 CFR 131.11. Similarly, the Board proposed dissolved oxygen criteria for the CSSC and Brandon Pool based upon a rationale different from that explained in Illinois EPA's May 2013 amended proposal and subsequent testimony. To the extent that the proposed dissolved oxygen criteria are adopted, it appears that the Illinois EPA justification is based upon a sound scientific rationale consistent with the requirements of 40 CFR 131.11.

F. Ammonia

EPA's review of the Board's proposed ammonia criteria indicates that the criteria are not derived using EPA's most recent 304(a) criteria toxicity datasets. To be consistent with 40 CFR 131.11(b)(1), the Board could revise the ammonia criteria consistent with EPA's 2013 304(a) ammonia criteria guidance, 304(a) guidance modified to reflect site-specific conditions, or other scientifically defensible methods based upon the toxicity datasets (available at: <http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm>).

To the extent that the Board instead elects to adopt standards based upon EPA's 1999 ammonia criteria document, the Board should address EPA's January 29, 2010, comments (submitted as Public Comment #286 in these proceedings) regarding the protection for Aquatic Life Use B waters including, but not limited to, EPA's recommendation that the ammonia criteria for the Aquatic Life Use B waters should ensure the protection of early life stages of fish during the months of March through October.

VI. Finalization of CAWS and LDPR Standards

In a letter dated May 16, 2012, EPA disapproved in accordance with Section 303(c)(3) of the Clean Water Act a number of the revisions to Illinois' water quality standards that the Board adopted in Subdocket A. In that letter, which has been included in the docket of these proceedings as Public Comment #1338, EPA specified the changes Illinois needed to make to meet the requirements of the Clean Water Act and 40 CFR Part 131. EPA urges the Board to take action in order to make those necessary changes to Illinois' water quality standards as soon as possible.

VII. References

Griffith, M.B. 2014. Natural variation and current reference for specific conductivity and major ions in wadeable streams of the conterminous USA. *Freshwater Science* 33: 1-17.

Kelly, W.R., S.V. Panno, and K.C. Hackley. 2012. Impacts of Road Salt Runoff on Water Quality of the Chicago, Illinois, Region. *Environmental and Engineering Geoscience* 18: 65-81.