POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

1) Heading of the Part: Water Quality Standards

2) Code Citation: 35 Ill. Adm. Code 302

3)

Section Numbers:	Proposed Actions:
302.100	Amendment
302.101	Amendment
302.102	Amendment
302.103	Amendment
302.105	Amendment
302.201	Amendment
302.202	Amendment
302.203	Amendment
302.204	Amendment
302.205	Amendment
302.206	Amendment
302.207	Amendment
302.208	Amendment
302.209	Amendment
302.210	Amendment
302.211	Amendment
302.212	Amendment
302.301	Amendment
302.302	Amendment
302.303	Amendment
302.304	Amendment
302.305	Amendment
302.306	Amendment
302.307	Amendment
302.401	Amendment
302.402	Amendment
302.403	Amendment
302.404	Amendment
302.405	Amendment
302.407	Amendment
302.408	Amendment
302.409	Amendment
302.410	Amendment
302.412	Amendment
302.501	Amendment

302.502	Amendment
302.503	Amendment
302.504	Amendment
302.505	Amendment
302.506	Amendment
302.507	Amendment
302.508	Amendment
302.509	Amendment
302.510	Repealed
302.515	Amendment
302.520	Amendment
302.521	Amendment
302.525	Amendment
302.530	Amendment
302.535	Amendment
302.540	Amendment
302.545	Amendment
302.550	Amendment
302.553	Amendment
302.555	Amendment
302.560	Amendment
302.563	Amendment
302.565	Amendment
302.570	Amendment
302.575	Amendment
302.580	Amendment
302.585	Amendment
302.590	Amendment
302.595	Amendment
302.601	Amendment
302.603	Amendment
302.604	Amendment
302.606	Amendment
302.612	Amendment
302.615	Amendment
302.618	Amendment
302.621	Amendment
302.627	Amendment
302.630	Amendment
302.633	Amendment

302.645	Amendment
302.648	Amendment
302.651	Amendment
302.654	Amendment
302.657	Amendment
302.658	Amendment
302.663	Amendment
302.666	Amendment
302.669	Amendment
302.Appendix A	Repealed
302.Appendix B	Repealed

4) Statutory Authority: Implementing Section 13 and authorized by Sections 11(b) and 27 of the Environmental Protection Act [415 ILCS 5/13, 11(b), and 27].

5) A Complete Description of the Subjects and Issues Involved: In 2016, the Board began reviewing its rules to identify obsolete, repetitive, confusing, or otherwise unnecessary language. On January 10, 2018, the Illinois Environmental Protection Agency (IEPA) filed a proposal to update provisions including Part 302. IEPA's proposal arose from Executive Order 2016-13, which required agencies to identify outdated, repetitive, confusing, or unnecessary rules and then amend or repeal them. These proposed amendments to Part 302 include those submitted by IEPA and those identified separately by the Board. Both IEPA and the Board intend the amendments to be non-substantive clarifications.

6) Published studies or reports, and sources of underlying data, used to compose this rulemaking: No

7) Will this proposed rulemaking replace an emergency rule currently in effect? No

8) Does this rulemaking contain an automatic repeal date? No

9) Does this proposed rulemaking contain incorporations by reference? No

10) Are there any proposed rulemakings to this Part pending? No

11) Statement of Statewide Policy Objectives: This proposed amendment does not create or enlarge a State mandate as defined in Section 3(b) of the State Mandates Act. [30 ILCS 805/3].

POLLUTION CONTROL BOARD

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12) Time, Place, and Manner in which interested persons may comment on this proposed rulemaking: The Board will accept written public comments on this proposal for a period of at least 45 days after the date of publication in the *Illinois Register*. Public comments should refer to Docket R18-23 and be filed electronically through the Clerk's Office On-Line (COOL) on the Board's website at pcb.illinois.gov. Public comments may be addressed to:

Clerk's Office
Illinois Pollution Control Board
100 W. Randolph St., Suite 11-500
Chicago, IL 60601

Interested persons may download copies of the Board's opinions and orders in R18-23 from the Board's Web site at pcb.illinois.gov and may also request copies by calling the Clerk's office at 312-814-3620.

13) Initial Regulatory Flexibility Analysis:

A) Types of small businesses, small municipalities and not for profit corporations affected: None

B) Reporting, bookkeeping or other procedures required for compliance: None

C) Types of Professional skills necessary for compliance: None

14) Small Business Impact Analysis: The Board expects that this rulemaking will not have an adverse impact on small business.

15) Regulatory Agenda on which this rulemaking was summarized: January 2022

The full text of the Proposed Amendments begins on the next page:

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE C: WATER POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD

PART 302
WATER QUALITY STANDARDS

SUBPART A: GENERAL WATER QUALITY PROVISIONS

SUBPART B: GENERAL USE WATER QUALITY STANDARDS

SUBPART C: PUBLIC AND FOOD PROCESSING WATER SUPPLY STANDARDS

SUBPART D: CHICAGO AREA WATERWAY SYSTEM AND LOWER DES PLAINES RIVER WATER QUALITY AND INDIGENOUS AQUATIC LIFE STANDARDS

SUBPART E: LAKE MICHIGAN BASIN WATER QUALITY STANDARDS

SUBPART F: PROCEDURES FOR DETERMINING WATER QUALITY CRITERIA

AUTHORITY: Implementing Section 13 and authorized by Sections 11(b) and 27 of the Environmental Protection Act [415 ILCS 5/13, 11(b), and 27].

SOURCE: Filed with the Secretary of State January 1, 1978; amended at 2 Ill. Reg. 44, p. 151, effective November 2, 1978; amended at 3 Ill. Reg. 20, p. 95, effective May 17, 1979; amended at 3 Ill. Reg. 25, p. 190, effective June 21, 1979; codified at 6 Ill. Reg. 7818; amended at 6 Ill. Reg. 11161, effective September 7, 1982; amended at 6 Ill. Reg. 13750, effective October 26, 1982; amended at 8 Ill. Reg. 1629, effective January 18, 1984; peremptory amendments at 10 Ill. Reg. 461, effective December 23, 1985; amended at R87-27 at 12 Ill. Reg. 9911, effective May 27, 1988; amended at R85-29 at 12 Ill. Reg. 12082, effective July 11, 1988; amended in R88-1 at 13 Ill. Reg. 5998, effective April 18, 1989; amended in R88-21(A) at 14 Ill. Reg. 2899, effective February 13, 1990; amended in R88-21(B) at 14 Ill. Reg. 11974, effective July 9, 1990; amended in R94-1(A) at 20 Ill. Reg. 7682, effective May 24, 1996; amended in R94-1(B) at 21 Ill. Reg. 370, effective December 23, 1996; expedited correction at 21 Ill. Reg. 6273, effective December 23, 1996; amended in R97-25 at 22 Ill. Reg. 1356, effective December 24, 1997; amended in R99-8 at 23 Ill. Reg. 11249, effective August 26, 1999; amended in R01-13 at 26 Ill. Reg. 3505, effective February 22, 2002; amended in R02-19 at 26 Ill. Reg. 16931, effective November 8, 2002; amended in R02-11 at 27 Ill. Reg. 166, effective December 20, 2002; amended in R04-21 at 30 Ill. Reg. 4919, effective March 1, 2006; amended in R04-25 at 32 Ill. Reg. 2254, effective January 28, 2008; amended in R07-9 at 32 Ill. Reg. 14978, effective September 8, 2008;

amended in R11-18 at 36 Ill. Reg. 18871, effective December 12, 2012; amended in R11-18(B) at 37 Ill. Reg. 7493, effective May 16, 2013; amended in R08-09(D) at 39 Ill. Reg. 9388, effective July 1, 2015; amended in R18-23 at 46 Ill. Reg. _____, effective _____.

SUBPART A: GENERAL WATER QUALITY PROVISIONS

Section 302.100 Definitions

Unless otherwise specified, the definitions of the Environmental Protection Act (Act) [415 ILCS 5] and 35 Ill. Adm. Code 301 apply to this Part. As used in this Part, each of the following definitions has the specified meaning.

"Acute Toxicity" means the capacity of any substance or combination of substances to cause mortality or other adverse effects in an organism resulting from a single or short-term exposure to the substance.

"Adverse Effect" means any gross or overt effect on an organism, including but not limited to reversible histopathological damage, severe convulsions, irreversible functional impairment and lethality, as well as any non-overt effect on an organism resulting in functional impairment or pathological lesions which may affect the performance of the whole organism, or which reduces an organism's ability to respond to an additional challenge.

"Chronic Toxicity" means the capacity of any substance or combination of substances to cause injurious or debilitating effects in an organism which result from exposure for a time period representing a substantial portion of the natural life cycle of that organism, including but not limited to the growth phase, the reproductive phases or such critical portions of the natural life cycle of that organism.

"Criterion" means the numerical concentration of one or more toxic substances derived in compliance with the procedures in Subpart F which, if not exceeded, would assure compliance with the narrative toxicity standard of 35 Ill. Adm. Code 302.210.

"Early Life Stages" of fish means the pre-hatch embryonic period, the post-hatch free embryo or yolk-sac fry, and the larval period, during which the organism feeds. Juvenile fish, which are anatomically similar to adults, are not considered an early life stage.

"Hardness" means a water quality parameter or characteristic consisting of the sum of calcium and magnesium concentrations expressed in terms of equivalent milligrams per liter as calcium carbonate. Hardness is measured in compliance with methods specified in 40 CFR 136, incorporated by reference in 35 Ill. Adm.

Code 301.106.

"Mixing Zone" means a portion of the waters of the State identified as a region within which mixing is allowed under 35 Ill. Adm. Code 302.102(d).

"Thermocline" means the plane of maximum rate of decrease of temperature with respect to depth in a thermally stratified body of water.

"Total Residual Chlorine" or "TRC" means those substances which include combined and uncombined forms of both chlorine and bromine and which are expressed, by convention, as an equivalent concentration of molecular chlorine. TRC is measured in compliance with methods specified in 40 CFR 136, incorporated by reference in 35 Ill. Adm. Code 301.106.

"Toxic Substance" means a chemical substance that causes adverse effects in humans, or in aquatic or terrestrial animal or plant life. Toxic substances include, but are not limited to, those substances listed in 40 CFR 302.4, incorporated by reference in 35 Ill. Adm. Code 301.106, or any "chemical substance" as defined by the Illinois Chemical Safety Act [430 ILCS 45]

"ZID" or "Zone of Initial Dilution" means a portion of a mixing zone, identified pursuant to 35 Ill. Adm. Code 302.102(e), within which acute toxicity standards need not be met.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.101 Scope and Applicability

a) This Part contains water quality standards which apply throughout the State as designated in 35 Ill. Adm. Code 303. Site specific water quality standards are found with the water use designations in 35 Ill. Adm. Code 303.

b) Subpart B contains general use water quality standards which must be met in waters of the State for which there is no specific use designation (35 Ill. Adm. Code 303.201).

c) Subpart C contains the public and food processing water supply standards. These are cumulative with Subpart B and must be met by all designated waters at the point at which water is drawn for treatment and distribution as a potable supply or for food processing (35 Ill. Adm. Code 303.202).

d) Subpart D contains the Chicago Area Waterway System and the Lower Des Plaines River water quality standards. These standards must be met only by certain waters designated in 35 Ill. Adm. Code 303.204, 303.220, 303.225,

303.227, 303.230, 303.235, 303.240 and 303.449. Subpart D also contains water quality standards applicable to indigenous aquatic life waters found only in the South Fork of the South Branch of the Chicago River (Bubbly Creek).

e) Subpart E contains the Lake Michigan Basin water quality standards. These must be met in the waters of the Lake Michigan Basin as designated in 35 Ill. Adm. Code 303.443.

f) Subpart F contains the procedures for determining each of the criteria designated in 35 Ill. Adm. Code 302.210 and 302.410.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.102 Allowed Mixing, Mixing Zones and ZIDs

a) Whenever a water quality standard is more restrictive than its corresponding effluent standard, or where there is no corresponding effluent standard specified at 35 Ill. Adm. Code 304, an opportunity will be allowed for compliance with 35 Ill. Adm. Code 304.105 by mixture of an effluent with its receiving waters, provided the discharger has made every effort to comply with the requirements of 35 Ill. Adm. Code 304.102.

b) The portion, volume and area of any receiving waters within which mixing is allowed pursuant to subsection (a) must be limited by the following:

1) Mixing must be confined in an area or volume of the receiving water no larger than the area or volume which would result after incorporation of outfall design measures to attain optimal mixing efficiency of effluent and receiving waters. These measures may include the use of diffusers and engineered location and configuration of discharge points.

2) Mixing is not allowed in waters which include a tributary stream entrance if the mixing occludes the tributary mouth or otherwise restricts the movement of aquatic life into or out of the tributary.

3) Mixing is not allowed in water adjacent to bathing beaches, bank fishing areas, boat ramps or dockages or any other public access area.

4) Mixing is not allowed in waters containing mussel beds, endangered species habitat, fish spawning areas, areas of important aquatic life habitat, or any other natural features vital to the well being of aquatic life in a manner that maintaining aquatic life in the body of water as a whole would be adversely affected.

5) Mixing is not allowed in waters that contain intake structures of public or food processing water supplies, points of withdrawal of water for irrigation, or watering areas accessed by wild or domestic animals.

6) Mixing must allow for a zone of passage for aquatic life in which water quality standards are met. However, a zone of passage is not required in receiving streams that have zero flow for at least seven consecutive days recurring on average in nine years out of 10.

7) The area and volume in which mixing occurs, alone or in combination with other areas and volumes of mixing, must not intersect any area of any body of water in such a manner that the maintenance of aquatic life in the body of water as a whole would be adversely affected.

8) The area and volume in which mixing occurs, alone or in combination with other areas and volumes of mixing, must not contain more than 25% of the cross-sectional area or volume of flow of a stream except for those streams for which the dilution ratio is less than 3:1. In streams where the dilution ratio is less than 3:1, the volume in which mixing occurs, alone or in combination with other volumes of mixing, must not contain more than 50% of the volume flow unless an applicant for an NPDES permit demonstrates, pursuant to subsection (d), that an adequate zone of passage is provided for pursuant to subsection (b)(6).

9) No mixing is allowed when the water quality standard for the constituent in question is already violated in the receiving water.

10) No body of water may be used totally for mixing of single outfall or combination of outfalls, except as provided in subsection (b)(6).

11) Single sources of effluents that have more than one outfall must be limited to a total area and volume of mixing no larger than that allowable if a single outfall were used.

12) The area and volume in which mixing occurs must be as small as is practicable under the limitations prescribed in this subsection (b), and in no circumstances may the mixing encompass a surface area larger than 26 acres.

c) All water quality standards of this Part must be met at every point outside of the area and volume of the receiving water within which mixing is allowed. The acute toxicity standards of this Part must be met within the area and volume within which mixing is allowed, except as provided in subsection (e).

d) Pursuant to the procedures of Section 39 of the Act and 35 Ill. Adm. Code 309, a person may apply to the Agency to include as a condition in an NPDES permit formal definition of the area and volume of the waters of the State within which mixing is allowed for the NPDES discharge in question. The defined area and volume of allowed mixing shall constitute a "mixing zone" for the purposes of 35 Ill. Adm. Code: Subtitle C. Upon proof by the applicant that a proposed mixing zone conforms with the requirements of Section 39 of the Act, this Section and any additional limitations as may be imposed by the Clean Water Act (CWA) (33 U.S.C. 1251 et seq.), the Act or Board regulations, the Agency must, under Section 39(b) of the Act, include within the NPDES permit a condition defining the mixing zone.

e) Under the procedures of Section 39 of the Act and 35 Ill. Adm. Code 309, a person may apply to the Agency to include as a condition in an NPDES permit a ZID as a component portion of a mixing zone. The ZID must be limited to waters within which effluent dispersion is immediate and rapid. For this subsection, "immediate" dispersion means an effluent's merging with receiving waters without delay in time after its discharge and within close proximity of the end of the discharge pipe, so as to minimize the length of exposure time of aquatic life to undiluted effluent, and "rapid" dispersion means an effluent's merging with receiving waters so as to minimize the length of exposure time of aquatic life to undiluted effluent. Upon proof by the applicant that a proposed ZID conforms with the requirements of Section 39 of the Act and this Section, the Agency must under Section 39(b) of the Act, include within the NPDES permit a condition defining the ZID.

f) Under Section 39 of the Act and 35 Ill. Adm. Code 309.103, an applicant for an NPDES permit must submit data to allow the Agency to determine that the nature of any mixing zone or mixing zone in combination with a ZID conforms with the requirements of Section 39 of the Act and of this Section. A permittee may appeal Agency determinations concerning a mixing zone or ZID under the procedures of Section 40 of the Act and 35 Ill. Adm. Code 309.181.

g) When a mixing zone is defined in an NPDES permit, the waters within that mixing zone, for the duration of that NPDES permit, constitutes the sole waters within which mixing is allowed for the permitted discharge. It will not be a defense in any action brought pursuant to 35 Ill. Adm. Code 304.105 that the area and volume of waters within which mixing may be allowed pursuant to subsection (b) is less restrictive than the area or volume or waters encompassed in the mixing zone.

h) When a mixing zone is explicitly denied in a NPDES permit, no waters may be used for mixing by the discharge to which the NPDES permit applies, all other provisions of this Section notwithstanding.

i) Where an NPDES permit is silent on the matter of a mixing zone, or when no NPDES permit is in effect, the burden of proof will be on the discharger to demonstrate compliance with this Section in any action brought pursuant to 35 Ill. Adm. Code 304.105.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.103 Stream Flows

Except as otherwise provided in this Chapter, the water quality standards in this Part apply at all times except during periods when flows are less than the average minimum seven day low flow which occurs once in ten years.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.105 Antidegradation

This Section protects existing uses of all waters of the State of Illinois, maintains the quality of waters with quality that is better than water quality standards, and prevents unnecessary deterioration of waters of the State.

a) Existing Uses
Uses actually attained in a surface water body or water body segment on or after November 28, 1975, whether or not they are included in the water quality standards, must be maintained and protected. Examples of degradation of existing uses of the waters of the State include:

1) an action that would result in the deterioration of the existing aquatic community, such as a shift from a community of predominantly pollutant-sensitive species to pollutant-tolerant species or a loss of species diversity;

2) an action that would result in a loss of a resident or indigenous species whose presence is necessary to sustain commercial or recreational activities; or

3) an action that would preclude continued use of a surface water body or water body segment for a public water supply or for recreational or commercial fishing, swimming, paddling or boating.

b) Outstanding Resource Waters

1) Waters that are designated as Outstanding Resource Waters (ORWs) pursuant to 35 Ill. Adm. Code 303.205 and listed in 35 Ill. Adm. Code

303.206 must not be lowered in quality except as provided below:

A) Activities that result in short-term, temporary (i.e., weeks or months) lowering of water quality in an ORW; or

B) Existing site stormwater discharges that comply with applicable federal and State stormwater management regulations and do not result in a violation of any water quality standards.

2) Any activity in subsection (b)(1)(A) or (b)(1)(B) that requires a National Pollutant Discharge Elimination System (NPDES) permit or a Clean Water Act (CWA) Section 401 certification must also comply with subsection (c)(2).

3) Any activity listed in subsection (b)(1) or any other proposed increase in pollutant loading to an ORW must also meet the following requirements:

A) All existing uses of the water will be fully protected; and

B) Except for activities falling under one of the exceptions provided in subsection (b)(1)(A) or (B) above:

i) The proposed increase in pollutant loading is necessary for an activity that will improve water quality in the ORW; and

ii) The improvement could not be practicably achieved without the proposed increase in pollutant loading.

4) Any proposed increase in pollutant loading requiring an NPDES permit or a CWA 401 certification for an ORW must be assessed pursuant to subsection (f) to determine compliance with this Section.

c) High Quality Waters

1) Except as otherwise provided in subsection (d), waters of the State whose existing quality is better than any of the established standards of this Part must be maintained in their present high quality, unless the lowering of water quality is necessary to accommodate important economic or social development.

2) The Agency must assess any proposed increase in pollutant loading that necessitates a new, renewed or modified NPDES permit or any activity requiring a CWA Section 401 certification to determine compliance with this Section. The assessment to determine compliance with this Section

must be made on a case-by-case basis. In making this assessment, the Agency must:

A) Consider the fate and effect of any parameters proposed for an increased pollutant loading.

B) Assure the following:

i) The applicable numeric or narrative water quality standard will not be exceeded as a result of the proposed activity;

ii) All existing uses will be fully protected;

iii) All technically and economically reasonable measures to avoid or minimize the extent of the proposed increase in pollutant loading have been incorporated into the proposed activity; and

iv) The activity that results in an increased pollutant loading will benefit the community at large.

C) Use the following information sources, when available:

i) Information, data or reports available to the Agency from its own sources;

ii) Information, data or reports supplied by the applicant;

iii) Agency experience with factually similar permitting scenarios; and

iv) Any other valid information available to the Agency.

d) Activities Not Subject to a Further Antidegradation Assessment
The following activities will not be subject to a further antidegradation assessment under subsection (c).

1) Short-term, temporary (i.e., weeks or months) lowering of water quality;

2) Bypasses that are not prohibited at 40 CFR 122.41(m), incorporated by reference at 35 Ill. Adm. Code 301.106;

3) Response actions under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, corrective

actions, under the Resource Conservation and Recovery Act (RCRA), as amended, or similar federal or State authority, taken to alleviate a release into the environment of hazardous substances, pollutants or contaminants which may pose a danger to public health or welfare;

4) Thermal discharges that have been approved through a CWA Section 316(a) demonstration;

5) New or increased discharges of a non-contact cooling water:

A) without additives, except as provided in subsection (d)(5)(B), returned to the same body of water from which it was taken, as defined by 35 Ill. Adm. Code 352.104, provided that the discharge complies with applicable Illinois thermal standards; or

B) containing chlorine when the non-contact cooling water is treated to remove residual chlorine, and returned to the same body of water from which it was taken, as defined in 35 Ill. Adm. Code 352.104, provided that the discharge complies with applicable Illinois thermal and effluent standards at 35 Ill. Adm. Code 302, 303, and 304;

6) Discharges permitted under a current general NPDES permit as provided by 415 ILCS 5/39(b) or a nationwide or regional CWA Section 404 permit are not subject to facility-specific antidegradation review; however, the Agency must assure that individual permits or certifications are required prior to all new pollutant loadings or hydrological modifications that necessitate a new, renewed or modified NPDES permit or CWA Section 401 certification that affects waters of particular biological significance, which may include streams identified by the Illinois Department of Natural Resources as "biologically significant"; or

7) Changing or including a new permit limitation that does not result in an actual increase of a pollutant loading, such as those stemming from improved monitoring data, new analytical testing methods, new or revised technology or water quality based effluent limits.

e) Lake Michigan Basin
Waters in the Lake Michigan basin as identified in 35 Ill. Adm. Code 303.443 are also subject to the requirements applicable to bioaccumulative chemicals of concern found at 35 Ill. Adm. Code 302.521.

f) Antidegradation Assessments
In conducting an antidegradation assessment under this Section, the Agency must

comply with the following procedures.

1) A permit application for any proposed increase in pollutant loading that necessitates the issuance of a new, renewed, or modified NPDES permit or a CWA Section 401 certification must include, to the extent necessary for the Agency to determine that the permit application meets the requirements of this Section, the following information:

A) Identification and characterization of the water body affected by the proposed load increase or proposed activity and the existing water body's uses. Characterization must address physical, biological and chemical conditions of the water body.

B) Identification and quantification of the proposed load increases for the applicable parameters and of the potential impacts of the proposed activity on the affected waters.

C) The purpose and anticipated benefits of the proposed activity. Such benefits may include:

i) Providing a centralized wastewater collection and treatment system for a previously unsewered community;

ii) Expanding to provide service for anticipated residential or industrial growth consistent with a community's long range urban planning;

iii) Adding a new product line or production increase or modification at an industrial facility; or

iv) Increasing or retaining current employment levels at a facility.

D) Assessments of alternatives to proposed increases in pollutant loading or activities subject to Agency certification under Section 401 of the CWA that result in less of a load increase, no load increase or minimal environmental degradation. Such alternatives may include:

i) Additional treatment levels, including no discharge alternatives;

ii) Discharge of waste to alternate locations, including publicly-owned treatment works and streams with greater

assimilative capacity; or

iii) Manufacturing practices that incorporate pollution prevention techniques.

E) Any additional information the Agency may request.

F) Proof that a copy of the application has been provided to the Illinois Department of Natural Resources.

2) The Agency must complete an antidegradation assessment in compliance with the provisions of this Section on a case-by-case basis.

A) The Agency must consider the criteria stated in 35 Ill. Adm. Code 302.105(c)(2).

B) The Agency must consider the information provided by the applicant under subsection (f)(1).

C) After its assessment, the Agency must produce a written analysis addressing the requirements of this Section and provide a decision yielding one of the following results:

i) If the proposed activity meets the requirements of this Section, then the Agency must proceed with public notice of the NPDES permit or CWA Section 401 certification and include the written analysis as a part of the fact sheet accompanying the public notice;

ii) If the proposed activity does not meet the requirements of this Section, then the Agency must provide a written analysis to the applicant and must be available to discuss the deficiencies that led to the disapproval. The Agency may suggest methods to remedy the conflicts with the requirements of this Section;

iii) If the proposed activity does not meet the requirements of this Section, but some lowering of water quality is allowable, then the Agency will contact the applicant with the results of the review. If the reduced loading increase is acceptable to the applicant, upon the receipt of an amended application, the Agency will proceed to public notice; or if the reduced loading increase is not acceptable to the applicant, the Agency will transmit its written review to the

applicant in the context of an NPDES permit denial or a CWA Section 401 certification denial.

3) The Agency will conduct public notice and public participation through the public notice procedures found in 35 Ill. Adm. Code 309.109 or CWA Section 401 certifications. The Agency must incorporate the following information into a fact sheet accompanying the public notice:

A) A description of the activity, including identification of water quality parameters for which there will be an increased pollutant loading;

B) Identification of the affected surface water body or water body segment, any downstream surface water body or water body segment also expected to experience a lowering of water quality, characterization of the designated and current uses of the affected surface water body or water body segment and identification of which uses are most sensitive to the proposed load increase;

C) A summary of any review comments and recommendations provided by Illinois Department of Natural Resources, local or regional planning commissions, zoning boards and any other entities the Agency consults regarding the proposal;

D) An overview of alternatives considered by the applicant and identification of any provisions or alternatives imposed to lessen the load increase associated with the proposed activity; and

E) The name and telephone number of a contact person at the Agency who can provide additional information.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

SUBPART B: GENERAL USE WATER QUALITY STANDARDS

Section 302.201 Scope and Applicability

Subpart B contains general use water quality standards which must be met in waters of the State for which there is no specific designation (35 Ill. Adm. Code 303.201).

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.202 Purpose

The General Use standards will protect the State's water for aquatic life, wildlife, agricultural use, secondary contact use and most industrial uses and ensure the aesthetic quality of the State's aquatic environment. Primary contact uses are protected for all General Use waters whose physical configuration permits such use.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.203 Offensive Conditions

Waters of the State must be free from sludge or bottom deposits, floating debris, visible oil, odor, plant or algal growth, color or turbidity of other than natural origin. The allowed mixing provisions of 35 Ill. Adm. Code 302.102 must not be used to comply with the provisions of this Section.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.204 pH

pH must be within the range of 6.5 to 9.0 except for natural causes.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.205 Phosphorus

Phosphorus: After December 31, 1983, Phosphorus as P must not exceed 0.05 milligram per liter (mg/L) in any reservoir or lake with a surface area of 8.1 hectares (20 acres) or more, or in any stream at the point where it enters any such reservoir or lake. For this Section, the term "reservoir or lake" does not include low level pools constructed in free flowing streams or any body of water which is an integral part of an operation which includes the application of sludge on land. Point source discharges which comply with 35 Ill. Adm. Code 304.123 must be in compliance with this Section for purposes of application of 35 Ill. Adm. Code 304.105.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.206 Dissolved Oxygen

General use waters must maintain dissolved oxygen concentrations at or above the values contained in subsections (a), (b) and (c).

a) General use waters at all locations must maintain sufficient dissolved oxygen concentrations to prevent offensive conditions as required in 35 Ill. Adm. Code 302.203. Quiescent and isolated sectors of General Use waters including wetlands, sloughs, backwaters and waters below the thermocline in lakes and

reservoirs must be maintained at sufficient dissolved oxygen concentrations to support their natural ecological functions and resident aquatic communities.

b) Except in those waters identified in Appendix D, the dissolved oxygen concentration in the main body of all streams, in the water above the thermocline of thermally stratified lakes and reservoirs, and in the entire water column of unstratified lakes and reservoirs must not be less than the following:

1) During the period of March through July,

A) 5.0 mg/L at any time; and

B) 6.0 mg/L as a daily mean averaged over 7 days.

2) During the period of August through February,

A) 3.5 mg/L at any time;

B) 4.0 mg/L as a daily minimum averaged over 7 days; and

C) 5.5 mg/L as a daily mean averaged over 30 days.

c) The dissolved oxygen concentration in all sectors within the main body of all streams identified in Appendix D must not be less than:

1) During the period of March through July,

A) 5.0 mg/L at any time; and

B) 6.25 mg/L as a daily mean averaged over 7 days.

2) During the period of August through February,

A) 4.0 mg/L at any time;

B) 4.5 mg/L as a daily minimum averaged over 7 days; and

C) 6.0 mg/L as a daily mean averaged over 30 days.

d) Assessing attainment of dissolved oxygen mean and minimum values.

1) Daily mean is the arithmetic mean of dissolved oxygen concentrations in 24 consecutive hours.

2) Daily minimum is the minimum dissolved oxygen concentration in 24 consecutive hours.

3) The measurements of dissolved oxygen used to determine attainment or lack of attainment with any of the dissolved oxygen standards in this Section must assure daily minima and daily means that represent the true daily minima and daily means.

4) The dissolved oxygen concentrations used to determine a daily mean or daily minimum should not exceed the air-equilibrated concentration.

5) "Daily minimum averaged over 7 days" means the arithmetic mean of daily minimum dissolved oxygen concentrations in 7 consecutive 24-hour periods.

6) "Daily mean averaged over 7 days" means the arithmetic mean of daily mean dissolved oxygen concentrations in 7 consecutive 24-hour periods.

7) "Daily mean averaged over 30 days" means the arithmetic mean of daily mean dissolved oxygen concentrations in 30 consecutive 24-hour periods.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.207 Radioactivity

a) Gross beta concentration must not exceed 100 picocuries per liter (pCi/L).

b) Strontium 90 concentration must not exceed 2 pCi/L.

c) The annual average radium 226 and 228 combined concentration must not exceed 3.75 pCi/L.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.208 Numeric Standards for Chemical Constituents

a) The acute standard (AS) for the chemical constituents listed in subsection (e) must not be exceeded at any time except for those waters for which a zone of initial dilution (ZID) has been approved by the Agency under 35 Ill. Adm. Code 302.102.

b) The chronic standard (CS) for the chemical constituents listed in subsection (e) must not be exceeded by the arithmetic average of at least four consecutive samples collected over any period of at least four days, except for those waters in

which the Agency has approved a mixing zone or in which mixing is allowed under 35 Ill. Adm. Code 302.102. The 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. For the chemical constituents that have water quality based standards dependent upon hardness, the chronic water quality standard will be calculated according to subsection (e) using the hardness of the water body at the time the sample was collected. To calculate attainment status of chronic-standards, the concentration of the chemical constituent in each sample is divided by the calculated water quality standard for the sample to determine a quotient. The water quality standard is attained if the mean of the sample quotients is less than or equal to one for the duration of the averaging period.

c) The human health standard (HHS) for the chemical constituents listed in subsection (f) must not be exceeded when the stream flow is at or above the harmonic mean flow under 35 Ill. Adm. Code 302.658 nor must an annual average, based on at least eight samples, collected in a manner representative of the sampling period, exceed the HHS except for those waters in which the Agency has approved a mixing zone or in which mixing is allowed under 35 Ill. Adm. Code 302.102.

d) The standard for the chemical constituents of subsections (g) and (h) must not be exceeded at any time except for those waters in which the Agency has approved a mixing zone or in which mixing is allowed under 35 Ill. Adm. Code 302.102.

e) Numeric Water Quality Standards for the Protection of Aquatic Organisms

Constituent	AS (µg/L)	CS (µg/L)
Arsenic (trivalent, dissolved)	360 x 1.0* = 360	190 x 1.0* = 190
Boron (total)	40,100	7,600
Cadmium (dissolved)	$e^{A+B\ln(H)} \times \left\{1.138672 - [(\ln(H))(0.041838)]\right\}$* where A = -2.918 and B = 1.128	$e^{A+B\ln(H)} \times \left\{1.101672 - [(\ln(H))(0.041838)]\right\}$* where A = -3.490 and B = 0.7852

Chromium (hexavalent, total)	16	11
Chromium (trivalent, dissolved)	$e^{A+B\ln(H)} \times 0.316$ * where A = 3.688 and B = 0.8190	$e^{A+B\ln(H)} \times 0.860$ * where A = 1.561 and B = 0.8190
Copper (dissolved)	$e^{A+B\ln(H)} \times 0.960$ * where A = -1.464 and B = 0.9422	$e^{A+B\ln(H)} \times 0.960$ * where A = -1.465 and B = 0.8545
Cyanide**	22	5.2
Fluoride (total)	$e^{A+B\ln(H)}$ where A = 6.7319 and B = 0.5394	$e^{A+B\ln(H)}$, but must not exceed 4.0 mg/L where A = 6.0445 and B = 0.5394
Lead (dissolved)	$e^{A+B\ln(H)} \times \left\{1.46203 - [(\ln(H))(0.145712)]\right\}$ * where A = -1.301 and B = 1.273	$e^{A+B\ln(H)} \times \left\{1.46203 - (\ln(H))(0.145712)\right\}$ * where A = -2.863 and B = 1.273
Manganese (dissolved)	$e^{A+B\ln(H)} \times 0.9812$* where A = 4.9187 and B = 0.7467	$e^{A+B\ln(H)} \times 0.9812$* where A = 4.0635 and B = 0.7467
Mercury (dissolved)	2.6 x 0.85* = 2.2	1.3 x 0.85* = 1.1
Nickel (dissolved)	$e^{A+B\ln(H)} \times 0.998$ * where A = 0.5173 and B = 0.8460	$e^{A+B\ln(H)} \times 0.997$ * where A = -2.286 and B = 0.8460

TRC	19	11
Zinc (dissolved)	$e^{A+B\ln(H)} \times 0.978$ *	$e^{A+B\ln(H)} \times 0.986$ *
	where A = 0.9035 and B = 0.8473	where A = -0.4456 and B = 0.8473
Benzene	4200	860
Ethylbenzene	150	14
Toluene	2000	600
Xylene(s)	920	360

where:

µg/L	=	microgram per liter
e^x	=	base of natural logarithms raised to the x-power
ln(H)	=	natural logarithm of Hardness (in mg/L as $CaCO_3$)
*	=	conversion factor multiplier for dissolved metals
**	=	standard to be evaluated using either of the following USEPA approved methods, incorporated by reference at 35 Ill. Adm. Code 301.106: Method OIA-1677, DW: Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry, January 2004, Document Number EPA-821-R-04-001 or Cyanide Amenable to Chlorination, Standard Methods 4500-CN-G (40 CFR 136.3)

f) Numeric Water Quality Standard for the Protection of Human Health

Constituent	(µg/L)
Mercury (total)	0.012
Benzene	310

where:

µg/L = micrograms per liter

g) Single-value standards apply at the following concentrations for these substances:

Constituent	Unit	Standard
Barium (total)	mg/L	5.0
Chloride (total)	mg/L	500
Iron (dissolved)	mg/L	1.0
Phenols	mg/L	0.1
Selenium (total)	mg/L	1.0
Silver (total)	µg/L	5.0

where:
mg/L = milligram per liter and
µg/L = microgram per liter

h) Water quality standards for sulfate are as follows:

1) At any point where water is withdrawn or accessed for purposes of livestock watering, the average of sulfate concentrations must not exceed 2,000 mg/L when measured at a representative frequency over a 30 day period.

2) The results of the following equations provide sulfate water quality standards in mg/L for the specified ranges of hardness (in mg/L as $CaCO_3$) and chloride (in mg/L) and must be met at all times:

A) If the hardness concentration of receiving waters is greater than or equal to 100 mg/L but less than or equal to 500 mg/L, and if the chloride concentration of waters is greater than or equal to 25 mg/L but less than or equal to 500 mg/L, then:

$$C = [1276.7 + 5.508 (hardness) - 1.457 (chloride)] * 0.65$$

where:

C = sulfate concentration

B) If the hardness concentration of waters is greater than or equal to 100 mg/L but less than or equal to 500 mg/L, and if the chloride concentration of waters is greater than or equal to 5 mg/L but less than 25 mg/L, then:

C = [-57.478 + 5.79 (hardness) + 54.163 (chloride)] * 0.65

where:

C = sulfate concentration

3) The following sulfate standards must be met at all times when hardness (in mg/L as $CaCO_3$) and chloride (in mg/L) concentrations other than specified in (h)(2) are present:

A) If the hardness concentration of waters is less than 100 mg/L or chloride concentration of waters is less than 5 mg/L, the sulfate standard is 500 mg/L.

B) If the hardness concentration of waters is greater than 500 mg/L and the chloride concentration of waters is 5 mg/L or greater, the sulfate standard is 2,000 mg/L.

C) If the combination of hardness and chloride concentrations of existing waters are not reflected in subsection (h)(3)(A) or (B), the sulfate standard may be determined in a site-specific rulemaking under section 303(c) of the Federal Water Pollution Control Act of 1972 (Clean Water Act), 33 U.S.C. 1313, and Federal Regulations at 40 CFR 131.10(j)(2).

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.209 Fecal Coliform

a) During the months May through October, based on a minimum of five samples taken over not more than a 30 day period, fecal coliform must not exceed a geometric mean of 200 per 100 milliliter (ml), nor must more than 10% of the samples during any 30 day period exceed 400 per 100 ml in protected waters. Protected waters are defined as waters which, due to natural characteristics, aesthetic value or environmental significance are deserving of protection from pathogenic organisms. Protected waters will meet one or both of the following conditions:

1) presently support or have the physical characteristics to support primary contact;

2) flow through or adjacent to parks or residential areas.

b) Waters unsuited to support primary contact uses because of physical, hydrologic or geographic configuration and are located in areas unlikely to be frequented by the public on a routine basis as determined by the Agency at 35 Ill. Adm. Code 309.Subpart A, are exempt from this standard.

c) The Agency must apply this rule as required by 35 Ill. Adm. Code 304.121.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.210 Other Toxic Substances

Waters of the State must 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.

a) Any substance or combination of substances must be deemed to be toxic or harmful to aquatic life if present in concentrations that exceed the following:

1) An Acute Aquatic Toxicity Criterion (AATC) validly derived and correctly applied under procedures in 35 Ill. Adm. Code 302.612 through 302.618 or in 35 Ill. Adm. Code 302.621; or

2) A Chronic Aquatic Toxicity Criterion (CATC) validly derived and correctly applied under procedures in 35 Ill. Adm. Code 302.627 or 302.630.

b) Any substance or combination of substances must be deemed to be toxic or harmful to wild or domestic animal life if present in concentrations that exceed any Wild and Domestic Animal Protection Criterion (WDAPC) validly derived and correctly applied under 35 Ill. Adm. Code 302.633.

c) Any substance or combination of substances must be deemed to be toxic or harmful to human health if present in concentrations that exceed criteria, validly derived and correctly applied, based on either of the following:

1) Disease or functional impairment due to a physiological mechanism for which there is a threshold dose below which no damage occurs calculated under 35 Ill. Adm. Code 302.642 through 302.648 (Human Threshold Criterion); or

2) Disease or functional impairment due to a physiological mechanism for which any dose may cause some risk of damage calculated under 35 Ill. Adm. Code 302.651 through 302.658 (Human Nonthreshold Criterion).

d) The most stringent criterion of subsections (a), (b), and (c) applies at all points outside of any waters within which, mixing is allowed under 35 Ill. Adm. Code 302.102. In addition, the AATC derived under subsection (a)(1) applies in all waters except that it must not apply within a ZID that is prescribed in compliance with 35 Ill. Adm. Code 302.102.

e) The procedures of Subpart F set forth minimum data requirements, appropriate test protocols and data assessment methods for establishing criteria under subsections (a), (b), and (c). No other procedures may be used to establish such criteria unless approved by the Board in a rulemaking or adjusted standards proceeding under Title VII of the Act. The validity and applicability of the Subpart F procedures may not be challenged in any proceeding brought under Titles VIII or X of the Act, although the validity and correctness of application of the numeric criteria derived under Subpart F may be challenged in such proceedings under subsection (f).

f) Challenges to application of criteria

1) A permittee may challenge the validity and correctness of application of a criterion derived by the Agency under this Section only at the time such criterion is first applied in an NPDES permit under 35 Ill. Adm. Code 309.152 or in an action under Title VIII of the Act for violation of the toxicity water quality standard. Failure of a person to challenge the validity of a criterion at the time of its first application will constitute a waiver of such challenge in any subsequent proceeding involving application of the criterion to that person.

2) Consistent with subsection (f)(1), if a criterion is included as, or is used to derive, a condition of an NPDES discharge permit, a permittee may challenge the criterion in a permit appeal under Section 40 of the Act and 35 Ill. Adm. Code 309.181.

3) Consistent with subsection (f)(1), in an action where alleged violation of the toxicity water quality standard is based on alleged excursion of a criterion, the person bringing such action will have the burdens of going forward with proof and of persuasion regarding the general validity and correctness of application of the criterion.

g) Subsections (a) through (e) do not apply to USEPA registered pesticides approved for aquatic application and applied under the following conditions:

1) Application must be made in strict compliance with label directions;

2) Applicator must be properly certified under the provisions of the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 135 et seq. (1972));

3) Applications of aquatic pesticides must be in compliance with the laws, regulations and guidelines of all state and federal agencies authorized by law to regulate, use or supervise pesticide applications.

4) Aquatic pesticide must not be applied to waters affecting public or food processing water supplies unless a permit to apply the pesticide has been obtained from the Agency. All permits must be issued so as not to cause a violation of the Act or of any of the Board's rules or regulations. To aid applicators in determining their responsibilities under this subsection, a list of waters affecting public water supplies will be published and maintained by the Agency's Division of Public Water Supplies.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.211 Temperature

a) There must not be abnormal temperature changes that may adversely affect aquatic life unless caused by natural conditions.

b) The normal daily and seasonal temperature fluctuations which existed before the addition of heat due to other than natural causes must be maintained.

c) The maximum temperature rise above natural temperatures must not exceed 2.8 °C (5 ºF).

d) In addition, the water temperature at representative locations in the main river must not exceed the maximum limits in the following table during more than one percent of the hours in the 12-month period ending with any month. Moreover, the water temperature at such locations must never exceed the maximum limits in the following table by more than 1.7 ºC (3 ºF).

	ºC	ºF		ºC	ºF
JAN	16	60	JUL.	32	90
FEB.	16	60	AUG.	32	90
MAR.	16	60	SEPT.	32	90
APR.	32	90	OCT.	32	90
MAY	32	90	NOV.	32	90
JUNE	32	90	DEC.	16	60

e) The owner or operator of a source of heated effluent which discharges 150

megawatts (0.5 billion British thermal units per hour) or more must demonstrate in a hearing before the Board in the case of new sources, after the commencement of operation, that discharges from that source have not caused and cannot be reasonably expected to cause significant ecological damage to the receiving waters. If the demonstration is not made to the satisfaction of the Board, the Board must order appropriate corrective measures to be implemented within a reasonable time as determined by the Board.

f) Permits for heated effluent discharges, whether issued by the Board or the Illinois Environmental Protection Agency (Agency), can be revised if reasonable future development creates a need for reallocation of the assimilative capacity of the receiving stream as defined in the regulation above.

g) The owner or operator of a source of heated effluent must maintain records and conduct studies of the effluents from the sources and of their effects as may be required by the Agency or in any permit granted under the Act.

h) Appropriate corrective measures will be required if, upon complaint filed in compliance with Board rules, it is found at any time that any heated effluent causes significant ecological damage to the receiving stream.

i) All effluents to an artificial cooling lake must comply with the applicable provisions of the thermal water quality standards in this Section and 35 Ill. Adm. Code 303, except when all of the following requirements are met:

1) All discharges from the artificial cooling lake to other waters of the State comply with the applicable provisions of subsections (a) through (d).

2) The heated effluent discharged to the artificial cooling lake complies with all other applicable provisions of this Chapter, except subsections (a) through (d).

3) At an adjudicative hearing the discharger must satisfactorily demonstrate to the Board that the artificial cooling lake receiving the heated effluent will be environmentally acceptable, and within the intent of the Act, including:

A) providing conditions capable of supporting shellfish, fish and wildlife, and recreational uses consistent with good management practices, and

B) controlling the thermal component of the discharger's effluent by a technologically feasible and economically reasonable method.

4) The required demonstration in subsection (j)(3) may take the form of an acceptable final environmental impact statement or pertinent provisions of environmental assessments used in the preparation of the final environmental impact statement, or may take the form of a demonstration under Section 316(a) of the Clean Water Act (CWA)(33 U.S.C. 1251 et seq.), which addresses the requirements of subsection (j)(3).

5) If the Board finds the demonstration to be adequate as provided in subsection (i)(3), the Board must promulgate specific thermal standards to be applied to the discharge to that artificial cooling Lake.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.212 Total Ammonia Nitrogen

a) Total ammonia nitrogen must in no case exceed 15 mg/L.

b) The total ammonia nitrogen acute, chronic, and sub-chronic standards are determined by the equations given in subsections (b)(1) and (b)(2). Attainment of each standard must be determined by subsections (c) and (d) in mg/L.

1) The acute standard (AS) is calculated using the following equation:

$$AS = \frac{0.411}{1 + 10^{7.204\text{-pH}}} + \frac{58.4}{1 + 10^{\text{pH-}7.204}}$$

2) The chronic standard (CS) is calculated using the following equations:

A) During the Early Life Stage Present period, as defined in subsection (e):

i) When water temperature is less than or equal to 14.51 °C:

$$CS = \left\{ \frac{0.0577}{1 + 10^{7.688\text{-pH}}} + \frac{2.487}{1 + 10^{\text{pH-}7.688}} \right\} (2.85)$$

ii) When water temperature is above 14.51 °C:

$$CS = \left\{ \frac{0.0577}{1 + 10^{7.688\text{-pH}}} + \frac{2.487}{1 + 10^{\text{pH-}7.688}} \right\} (1.45 * 10^{0.028*(25\text{-}T)})$$

Where T = Water Temperature, degrees Celsius

B) During the Early Life Stage Absent period, as defined in

subsection (e):

i) When water temperature is less than or equal to 7 °C:

$$CS = \left\{ \frac{0.0577}{1 + 10^{7.688-pH}} + \frac{2.487}{1 + 10^{pH-7.688}} \right\} (1.45*10^{0.504})$$

ii) When water temperature is greater than 7 °C:

$$CS = \left\{ \frac{0.0577}{1 + 10^{7.688-pH}} + \frac{2.487}{1 + 10^{pH-7.688}} \right\} (1.45*10^{0.028*(25-T)})$$

Where T = Water Temperature, degrees Celsius

3) The sub-chronic standard is equal to 2.5 times the chronic standard.

c) Attainment of the Total Ammonia Nitrogen Water Quality Standards

1) The acute standard of total ammonia nitrogen (in mg/L) must not be exceeded at any time except in those waters for which the Agency has approved a ZID under 35 Ill. Adm. Code 302.102.

2) The 30-day average concentration of total ammonia nitrogen (in mg/L must not exceed the chronic standard (CS) except in those waters in which mixing is allowed under 35 Ill. Adm. Code 302.102. Attainment of the chronic standard (CS) is evaluated under subsection (d) by averaging at least four samples collected at weekly intervals or at other sampling intervals that statistically represent a 30-day sampling period. The samples must be collected in a manner that assures a representative sampling period.

3) The 4-day average concentration of total ammonia nitrogen (in mg/L) must not exceed the sub-chronic standard except in those waters in which mixing is allowed under 35 Ill. Adm. Code 302.102. Attainment of the sub-chronic standard is evaluated pursuant to subsection (d) by averaging daily sample results collected over a period of four consecutive days within the 30-day averaging period. The samples must be collected in a manner that assures a representative sampling period.

d) The water quality standard for each water body must be calculated based on the temperature and pH of the water body measured at the time of each ammonia sample. The concentration of total ammonia in each sample must be divided by the calculated water quality standard for the sample to determine a quotient. The water quality standard is attained if the mean of the sample quotients is less than

or equal to one for the duration of the averaging period.

e) The Early Life Stage Present period occurs from March through October. In addition, during any other period when early life stages are present, and where the water quality standard does not provide adequate protection for these organisms, the water body must meet the Early Life Stage Present water quality standard. All other periods are subject to the Early Life Stage Absent period.

BOARD NOTE: Acute and chronic standard concentrations for total ammonia nitrogen (in mg/L) for different combinations of pH and temperature are shown in Appendix C.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

SUBPART C: PUBLIC AND FOOD PROCESSING WATER SUPPLY STANDARDS

Section 302.301 Scope and Applicability

Subpart C contains the public and food processing water supply standards. These are cumulative with the general use standards of Subpart B and must be met in all waters designated in Part 303 at any point at which water is withdrawn for treatment and distribution as a potable supply or for food processing. Waters of the State are generally designated for public and food processing use (35 Ill. Adm. Code 303.202).

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.302 Algicide Permits

The water quality standards of Subparts B and C may be exceeded if the occurrence results from applying an algicide under an algicide permit issued by the Agency under 35 Ill. Adm. Code 602.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.303 Finished Water Standards

Water must be of such quality that with treatment consisting of coagulation, sedimentation, filtration, storage and chlorination, or other equivalent treatment processes, the treated water meets all requirements of 35 Ill. Adm. Code 611.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.304 Chemical Constituents

The following levels of chemical constituents must not be exceeded:

	CONCENTRATION

CONSTITUENT	(mg/L)
Arsenic (total)	0.05
Barium (total)	1.0
Boron (total)	1.0
Cadmium (total)	0.010
Chloride (total)	250
Chromium	0.05
Fluoride (total)	1.4
Iron (dissolved)	0.3
Lead (total)	0.05
Manganese (total)	1.0
Nitrate-Nitrogen	10
Oil (hexane-solubles or equivalent)	0.1
Organics	
Pesticides	
Chlorinated Hydro-carbon Insecticides	
Aldrin	0.001
Chlordane	0.003
DDT	0.05
Dieldrin	0.001
Endrin	0.0002
Heptachlor	0.0001
Heptachlor Expoxide	0.0001
Lindane	0.004
Methoxychlor	0.1
Toxaphene	0.0005
Organophosphate Insecticides	
Parathion	0.1
Chlorophenoxy Herbicides	
2,4-Dichlorophenoxy-acetic acid (2,4-D)	0.1
2-(2,4,5-Trichloro-phenoxy)-propionic acid (2,4,5-TP or Silvex)	0.01
Phenols	0.001
Selenuim (total)	0.01
Sulphates	250
Total Dissolved Solids	500

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.305 Other Contaminants

Other contaminants which will not be adequately reduced by the treatment processes in 35 Ill. Adm. Code 302.303 must not be present in concentrations hazardous to human health.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.306 Fecal Coliform

Notwithstanding the provisions of 35 Ill. Adm. Code 302.209, at no time shall the geometric mean, based on a minimum of five samples taken over not more than a 30 day period, of fecal coliform exceed 2000 per 100 ml.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.307 Radium 226 and 228

Radium 226 and 228 combined concentration must not exceed 5 picocuries per liter (pCi/L) at any time.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

SUBPART D: CHICAGO AREA WATERWAY SYSTEM AND LOWER DES PLAINES RIVER WATER QUALITY STANDARDS AND INDIGENOUS AQUATIC LIFE STANDARDS

Section 302.401 Scope and Applicability

a) Subpart D contains the standards that must be met only by the South Fork of the South Branch of the Chicago River (Bubbly Creek). The Subpart B general use and Subpart C public and food processing water supply standards do not apply to Bubbly Creek.

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 35 Ill. Adm. Code 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.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.402 Purpose

The Chicago Area Waterway System and Lower Des Plaines River standards protect primary contact, incidental contact or non-contact recreational uses (except when 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. The numeric and narrative standards 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 301 and designated in 35 Ill. Adm. Code 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 this Subpart D. However, the Chicago River is required to meet the general use standard, including the water quality standard for fecal coliform bacteria applicable to protected waters in 35 Ill. Adm. Code 302.209.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.403 Unnatural Sludge

Waters subject to this subpart must be free from unnatural sludge or bottom deposits, floating debris, visible oil, odor, unnatural plant or algal growth, or unnatural color or turbidity.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.404 pH

pH must be within the range of 6.5 to 9.0 except for natural causes, except for the South Fork of the South Branch of the Chicago River (Bubbly Creek) for which pH must be within the range of 6.0 to 9.0 except for natural causes.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.405 Dissolved Oxygen

Dissolved oxygen concentrations must not be less than the applicable values in subsections (a),

(b), (c), and (d).

a) For the South Fork of the South Branch of the Chicago River (Bubbly Creek), dissolved oxygen concentrations must not be less than 4.0 mg/L at any time.

b) For the Upper Dresden Island Pool Aquatic Life Use waters listed in 35 Ill. Adm. Code 303.230:

1) during the period of March through July:

A) 6.0 mg/L as a daily mean averaged over 7 days; and

B) 5.0 mg/L at any time; and

2) during the period of August through February:

A) 5.5 mg/L as a daily mean averaged over 30 days;

B) 4.0 mg/L as a daily minimum averaged over 7 days; and

C) 3.5 mg/L at any time.

c) For the Chicago Area Waterway System Aquatic Life Use A waters listed in 35 Ill. Adm. Code 303.235:

1) during the period of March through July, 5.0 mg/L at any time; and

2) during the period of August through February:

A) 4.0 mg/L as a daily minimum averaged over 7 days; and

B) 3.5 mg/L at any time.

d) For the Chicago Area Waterway System and Brandon Pool Aquatic Life Use B waters listed in 35 Ill. Adm. Code 303.240:

1) 4.0 mg/L as a daily minimum averaged over 7 days; and

2) 3.5 mg/L at any time.

e) Assessing attainment of dissolved oxygen mean and minimum values.

1) Daily mean is the arithmetic mean of dissolved oxygen concentrations in 24 consecutive hours.

2) Daily minimum is the minimum dissolved oxygen concentration in 24 consecutive hours.

3) The measurements of dissolved oxygen used to determine attainment or lack of attainment with any of the dissolved oxygen standards in this Section must assure daily minima and daily means that represent the true daily minima and daily means.

4) The dissolved oxygen concentrations used to determine a daily mean or daily minimum should not exceed the air-equilibrated concentration.

5) "Daily minimum averaged over 7 days" means the arithmetic mean of daily minimum dissolved oxygen concentrations in 7 consecutive 24-hour periods.

6) "Daily mean averaged over 7 days" means the arithmetic mean of daily mean dissolved oxygen concentrations in 7 consecutive 24-hour periods.

7) "Daily mean averaged over 30 days" means the arithmetic mean of daily mean dissolved oxygen concentrations in 30 consecutive 24-hour periods.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.407 Chemical Constituents

a) The acute standard (AS) for the chemical constituents listed in subsection (e) must not be exceeded at any time except as provided in subsection (d).

b) The chronic standard (CS) for the chemical constituents listed in subsection (e) must not be exceeded by the arithmetic average of at least four consecutive samples collected over any period of four days, except as provided in subsection (d). The 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. For the chemical constituents that have water quality based standards dependent upon hardness, the chronic water quality standard will be calculated according to subsection (e) using the hardness of the water body at the time the sample was collected. To calculate attainment status of chronic standards, the concentration of the chemical constituent in each sample is divided by the calculated water quality standard for the sample to determine a quotient. The water quality standard is attained if the mean of the sample quotients is less than or equal to one for the duration of the averaging period.

c) The human health standard (HHS) for the chemical constituents listed in subsection (f) must not be exceeded, on a 12-month rolling average based on at least eight samples, collected in a manner representative of the sampling period, except as provided in subsection (d).

d) In waters where mixing is allowed under 35 Ill. Adm. Code 302.102, the following apply:

1) The AS must not be exceeded in any waters except for those waters for which a zone of initial dilution (ZID) applies under 35 Ill. Adm. Code 302.102.

2) The CS must not be exceeded outside of waters in which mixing is allowed under 35 Ill. Adm. Code 302.102.

3) The HHS must not be exceeded outside of waters in which mixing is allowed under 35 Ill. Adm. Code 302.102.

e) Numeric Water Quality Standards for the Protection of Aquatic Organisms

Constituent	AS (µg/L)	CS (µg/L)
Arsenic (trivalent, dissolved)	340 X 1.0*=340	150 X 1.0*=150
Benzene	4200	860
Cadmium (dissolved)	$e^{A+B\ \ln(H)}$ X {1.138672-[(ln(H))(0.041838)]}*, where A=-2.918 and B=1.128	$e^{A+B\ \ln(H)}$ X {1.101672-[(ln(H))(0.041838)]}*, where A= -3.490 and B=0.7852
Chromium (hexavalent, total)	16	11
Chromium (trivalent, dissolved)	$e^{A+B\ \ln(H)}$ X 0.316*, where A=3.7256 and B=0.8190	$e^{A+B\ \ln(H)}$ X 0.860*, where A=0.6848 and B=0.8190
Copper (dissolved)	$e^{A+B\ \ln(H)}$ X 0.960*, where A=-1.645 and B=0.9422	$e^{A+B\ \ln(H)}$ X 0.960*, where A=-1.646 and B=0.8545
Cyanide**	22	10
Ethylbenzene	150	14
Fluoride (total)	$e^{A+B\ \ln(H)}$, where A=6.7319 and B=0.5394	$e^{A+B\ \ln(H)}$, but must not exceed 4.0 mg/L, where A=6.0445 and B=0.5394

Lead (dissolved)	$e^{A+B\ ln(H)}$ X {1.46203-[(ln(H))(0.145712)]}*, where A=-1.301 and B=1.273	$e^{A+B\ ln(H)}$ X {1.46203-[(ln(H))(0.145712)]}*, where A=-2.863 and B=1.273
Manganese (dissolved)	$e^{A+B\ ln(H)}$ X 0.9812*, where *A*=4.9187 and *B*=0.7467	$e^{A+B\ ln(H)}$ X 0.9812*, where *A*=4.0635 and *B*=0.7467
Mercury (dissolved)	1.4 X 0.85*=1.2	0.77 X 0.85*=0.65
Nickel (dissolved)	$e^{A+B\ ln(H)}$ X 0.998*, where A=0.5173 and B=0.8460	$e^{A+B\ ln(H)}$ X 0.997*, where A=-2.286 and B=0.8460
Toluene	2000	600
TRC	19	11
Xylene(s)	920	360
Zinc (dissolved)	$e^{A+B\ ln(H)}$ X 0.978*, where A=0.9035 and B=0.8473	$e^{A+B\ ln(H)}$ X 0.986*, where A=-0.4456 and B=0.8473

where:

µg/L = microgram per liter

H = Hardness concentration of receiving water in mg/L as $CaCO_3$

e^x = base of natural logarithms raised to the x-power

ln(H) = natural logarithm of Hardness in mg/L as $CaCO_3$

* = conversion factor multiplier for dissolved metals

** = standard to be evaluated using either of the following USEPA approved methods, incorporated by reference at 35 Ill. Adm. Code 301.106: Method OIA-1677, DW: Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry, January 2004, Document Number EPA-821-R-04-001 or Cyanide Amenable to Chlorination, Standard Methods 4500-CN-G (40 CFR 136.3)

f) Numeric Water Quality Standard for the Protection of Human Health

Constituent	HHS (µg/L)
Benzene	310
Mercury (total)	0.012
Phenols	860,000

where:

µg/L = microgram per liter

g) Numeric Water Quality Standards for Other Chemical Constituents

1) Concentrations of the following chemical constituents must not be exceeded except in waters for which mixing is allowed under 35 Ill. Adm. Code 302.102.

Constituent	Unit	Standard
Iron (dissolved)	mg/L	1.0
Selenium (total)	mg/L	1.0
Silver (dissolved)	µg/L	$e^{A+B \ln(H)}$ X 0.85*, where A=-6.52 and B=1.72
Sulfate (where H is ≥ 100 but ≤ 500 and C is ≥ 25 but ≤ 500)	mg/L	[1276.7+5.508(H)-1.457(C)] X 0.65
Sulfate (where H is ≥ 100 but ≤ 500 and C is ≥ 5 but < 25)	mg/L	[-57.478 + 5.79(H) + 54.163(C)] X 0.65
Sulfate (where H > 500 and C ≥ 5)	mg/L	2,000

where:

mg/L = milligram per liter
µg/L = microgram per liter
H = Hardness concentration of receiving water in mg/L as $CaCO_3$
C = Chloride concentration of receiving water in mg/L
e^x = base of natural logarithms raised to the x-power
ln(H) = natural logarithm of Hardness in milligrams per liter
* = conversion factor multiplier for dissolved metals

2)

Beginning July 1, 2018, the following concentration for Chloride must not be exceeded except in waters for which mixing is allowed under 35 Ill. Adm. Code 302.102:

Constituent	Unit	Standard
Chloride	mg/L	500

where:

mg/L = milligram per liter

h) Concentrations of other chemical constituents in the South Fork of the South Branch of the Chicago River (Bubbly Creek) must not exceed the following standards:

CONSTITUENT		CONCENTRATION (mg/L)
Ammonia Un-ionized (as N*)		0.1
Arsenic (total)		1.0
Barium (total)		5.0
Cadmium (total)		0.15
Chromium (total hexavalent)		0.3
Chromium (total trivalent)		1.0
Copper (total)		1.0
Cyanide (total)		0.10
Fluoride (total)		15.0
Iron (total)		2.0
Iron (dissolved)		0.5
Lead (total)		0.1
Manganese (total)		1.0
Mercury (total)		0.0005
Nickel (total)		1.0

Oil, fats and grease		15.0**
Phenols		0.3
Selenium (total)		1.0
Silver		1.1
Zinc (total)		1.0
Total Dissolved Solids		1500

* For purposes of this Section, the concentration of un-ionized ammonia must be computed according to the following equation:

$$U = \frac{N}{\left[0.94412\left(1+10^{x}\right)+0.0559\right]}$$

where:

$$X = 0.09018 + \frac{2729.92 - pH}{\left(T + 273.16\right)}$$

U = Concentration of un-ionized ammonia as N in mg/L

N = Concentration of ammonia nitrogen as N in mg/L

T = Temperature in degrees Celsius

** Oil must be analytically separated into polar and non-polar components if the total concentration exceeds 15 mg/L. In no case shall either of the components exceed 15 mg/L (i.e., 15 mg/L polar materials and 15 mg/L non-polar materials).

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.408 Temperature

a) For the South Fork of the South Branch of the Chicago River (Bubbly Creek), temperature must not exceed 34 ºC (93 ºF) more than 5% of the time, or 37.8 ºC (100 ºF) at any time.

b) The temperature standards in subsections (c) through (i) will become applicable beginning July 1, 2018. Starting July 1, 2015, the waters designated at 35 Ill. Adm. Code 303 as Chicago Area Waterway System Aquatic Life Use A, Chicago Area Waterway System and Brandon Pool Aquatic Life Use B, and Upper Dresden Island Pool Aquatic Life Use must not exceed temperature of 34 °C (93 °F) more than 5% of the time, or 37.8 °C (100 °F) at any time.

c) There must not be abnormal temperature changes that may adversely affect aquatic life unless caused by natural conditions.

d) The normal daily and seasonal temperature fluctuations that existed before the addition of heat due to other than natural causes must be maintained.

e) The maximum temperature rise above natural temperatures must never exceed 2.8 °C (5 °F).

f) Water temperature at representative locations in the main river must never exceed the maximum limits in the applicable table in subsections (g), (h) and (i), during more than one percent of the hours in the 12-month period ending with any month. The water temperature must not exceed the maximum limits in the applicable table that follows by more than 1.7 °C (3.0 °F).

g) Water temperature in the Chicago Area Waterway System Aquatic Life Use A waters listed in 35 Ill. Adm. Code 303.235 must not exceed the limits in the following table in compliance with subsection (f):

Months	Daily Maximum	
	(° C)	(° F)
January	16	60
February	16	60
March	16	60
April	32	90
May	32	90
June	32	90
July	32	90
August	32	90
September	32	90
October	32	90
November	32	90
December	16	60

h) Water temperature in the Chicago Area Waterway System and Brandon Pool Aquatic Life Use B waters listed in 35 Ill. Adm. Code 303.240 must not exceed the limits in the following table in compliance with subsection (f):

Months	Daily Maximum

	(° C)	(° F)
January	16	60
February	16	60
March	16	60
April	32	90
May	32	90
June	32	90
July	32	90
August	32	90
September	32	90
October	32	90
November	32	90
December	16	60

i) Water temperature for the Upper Dresden Island Pool Aquatic Life Use waters, as defined in 35 Ill. Adm. Code 303.230, must not exceed the limits in the following table in compliance with subsection (f):

Months	Daily Maximum	
	(° C)	(° F)
January	16	60
February	16	60
March	16	60
April	32	90
May	32	90
June	32	90
July	32	90
August	32	90
September	32	90
October	32	90
November	32	90
December	16	60

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.409 Cyanide for the South Fork of the South Branch of the Chicago River (Bubbly Creek)

Cyanide (total) must not exceed 0.10 mg/L in the South Fork of the South Branch of the Chicago River (Bubbly Creek).

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.410 Other Toxic Substances

Any substance or combination of substances toxic to aquatic life not listed in Section 302.407 must not exceed one-half of the 96-hour median tolerance limit (96-hour TL_m) 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 35 Ill. Adm. Code 303 must 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.

a) Any substance or combination of substances will be deemed to be toxic or harmful to aquatic life if present in concentrations that exceed the following:

1) An Acute Aquatic Toxicity Criterion (AATC) validly derived and correctly applied under procedures in 35 Ill. Adm. Code 302.612 through 302.618 or in 35 Ill. Adm. Code 302.621; or

2) A Chronic Aquatic Toxicity Criterion (CATC) validly derived and correctly applied under procedures in 35 Ill. Adm. Code 302.627 or 302.630.

b) Any substance or combination of substances will be deemed to be toxic or harmful to wild or domestic animal life if present in concentrations that exceed any Wild and Domestic Animal Protection Criterion (WDAPC) validly derived and correctly applied under 35 Ill. Adm. Code 302.633.

c) Any substance or combination of substances will be deemed to be toxic or harmful to human health if present in concentrations that exceed criteria, validly derived and correctly applied, based on either of the following:

1) Disease or functional impairment due to a physiological mechanism for which there is a threshold dose below which no damage occurs calculated under 35 Ill. Adm. Code 302.642 through 302.648 (Human Threshold Criterion); or

2) Disease or functional impairment due to a physiological mechanism for which any dose may cause some risk of damage calculated under 35 Ill. Adm. Code 302.651 through 302.658 (Human Nonthreshold Criterion).

d) The most stringent criterion of subsections (a), (b) and (c) applies at all points outside of any waters within which, mixing is allowed under 35 Ill. Adm. Code 302.102. In addition, the AATC derived under subsection (a)(1) applies in all waters except that it must not apply within a ZID that is prescribed in compliance with 35 Ill. Adm. Code 302.102.

e) The procedures of Subpart F set forth minimum data requirements, appropriate test protocols, and data assessment methods for establishing criteria under subsections (a), (b) and (c). No other procedures may be used to establish such criteria unless approved by the Board in a rulemaking or adjusted standard proceeding under Title VII of the Act. The validity and applicability of the Subpart F procedures may not be challenged in any proceeding brought under Title VIII or X of the Act, although the validity and correctness of application of the numeric criteria derived under Subpart F may be challenged in the proceedings under subsection (f).

f) Agency derived criteria may be challenged as follows:

1) A permittee may challenge the validity and correctness of application of a criterion derived by the Agency under this Section only at the time the criterion is first applied in an NPDES permit under 35 Ill. Adm. Code 309.152 or in an action under Title VIII of the Act for violation of the toxicity water quality standard. Failure of a person to challenge the validity of a criterion at the time of its first application constitutes a waiver of the challenge in any subsequent proceeding involving application of the criterion to that person.

2) Consistent with subsection (f)(1), if a criterion is included as, or is used to derive, a condition of an NPDES discharge permit, a permittee may challenge the criterion in a permit appeal under Section 40 of the Act and 35 Ill. Adm. Code 309.181. In any such action, the Agency must include in the record all information upon which it has relied in developing and applying the criterion, whether that information was developed by the Agency or submitted by the Petitioner. The burden of proof is on the Petitioner to demonstrate that the criterion-based condition is not necessary to accomplish the purposes of subsection (f)(1) (see Section 40(a)(1) of the Act), but there is no presumption in favor of the general validity and correctness of the application of the criterion as reflected in the challenged condition.

3) Consistent with subsection (f)(1), in an action in which alleged violation of the toxicity water quality standard is based on alleged excursion of a criterion, the person bringing the action has the burdens of going forward

with proof and of persuasion regarding the general validity and correctness of application of the criterion.

g) Subsections (a) through (e) do not apply to USEPA registered pesticides approved for aquatic application and applied under the following conditions:

1) Application must be made in strict compliance with label directions;

2) Applicator must be properly certified under the provisions of the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 135 et seq. (1972)); and

3) Applications of aquatic pesticides must comply with the laws, regulations and guidelines of all state and federal agencies authorized by law to regulate, use or supervise pesticide applications.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.412 Total Ammonia Nitrogen

a) This Section does not apply to the South Fork of the South Branch of the Chicago River (Bubbly Creek).

b) For the Chicago Area Waterway System and the Lower Des Plaines River described in 35 Ill. Adm. Code 303.204 and listed in 35 Ill. Adm. Code 303.220 through 303.240, total ammonia nitrogen must in no case exceed 15 mg/L.

c) The total ammonia nitrogen acute, chronic, and sub-chronic standards are determined in compliance with the equations in subsections (c)(1) and (c)(2). Attainment of each standard must be determined in compliance with subsections (d) and (e) in mg/L.

1) The acute standard (AS) is calculated using the following equation:

$$AS = \frac{0.411}{1+10^{7.204-pH}} + \frac{58.4}{1+10^{pH-7.204}}$$

2) The chronic standard (CS) is calculated using the following equations:

A) During the Early Life Stage Present period, as defined in subsection (f):

i) When water temperature is less than or equal to 14.51 ºC:

$$CS = \left\{ \frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right\} (2.85)$$

ii) When water temperature is above 14.51 ºC:

$$CS = \left\{ \frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right\} \left(1.45 * 10^{0.028*(25-T)}\right)$$

where:

T = Water Temperature, degrees Celsius

B) During the Early Life Stage Absent period, as defined in subsection (f):

i) When water temperature is less than or equal to 7 ºC:

$$CS = \left\{ \frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right\} \left(1.45 * 10^{0.504}\right)$$

ii) When water temperature is greater than 7 ºC:

$$CS = \left\{ \frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right\} \left(1.45 * 10^{0.028(25-T)}\right)$$

Where:

T = Water Temperature, degrees Celsius

3) The sub-chronic standard is equal to 2.5 times the chronic standard.

d) Attainment of the Total Ammonia Nitrogen Water Quality Standards

1) The acute standard for total ammonia nitrogen (in mg/L) must not be exceeded at any time except in those waters for which the Agency has approved a ZID under 35 Ill. Adm. Code 302.102.

2) The 30-day average concentration of total ammonia nitrogen (in mg/L) must not exceed the chronic standard (CS) except in those waters in which mixing is allowed under 35 Ill. Adm. Code 302.102. Attainment of the

chronic standard (CS) is determined in compliance with subsection (e) by averaging at least four samples collected at weekly intervals or at other sampling intervals that statistically represent a 30-day sampling period. The samples must be collected in a manner that assures a representative sampling period.

3) The 4-day average concentration of total ammonia nitrogen (in mg/L) must not exceed the sub-chronic standard except in those waters in which mixing is allowed under 35 Ill. Adm. Code 302.102. Attainment of the sub-chronic standard is determined in compliance with subsection (e) by averaging daily sample results collected over a period of four consecutive days within the 30-day averaging period. The samples must be collected in a manner that assures a representative sampling period.

e) The water quality standard for each water body must be calculated based on the temperature and pH of the water body measured at the time of each ammonia sample. The concentration of total ammonia in each sample must be divided by the calculated water quality standard for the sample to determine a quotient. The water quality standard is attained if the mean of the sample quotients is less than or equal to one for the duration of the averaging period.

f) The Early Life Stage Present period occurs from March through October. All other periods are subject to the Early Life Stage Absent period, except that waters listed in 35 Ill. Adm. Code 303.240 are not subject to Early Life Stage Present ammonia limits at any time.

BOARD NOTE: Acute and chronic standard concentrations for total ammonia nitrogen (in mg/L) for different combinations of pH and temperature are shown in Appendix C.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

SUBPART E: LAKE MICHIGAN BASIN WATER QUALITY STANDARDS

Section 302.501 Scope, Applicability, and Definitions

a) Subpart E contains the Lake Michigan Basin water quality standards. These must be met in the waters of the Lake Michigan Basin as designated in 35 Ill. Adm. Code 303.443.

b) In addition to the definitions provided at 35 Ill. Adm. Code 301.200 through 301.444, and in place of conflicting definitions at 35 Ill. Adm. Code 302.100, the following terms have the meanings specified for the Lake Michigan Basin:

"Acceptable daily exposure" or "ADE" means an estimate of the

maximum daily dose of a substance that is not expected to result in adverse noncancer effects to the general human population, including sensitive subgroups.

"Acceptable endpoints", for the purpose of deriving wildlife criteria, means acceptable subchronic and chronic endpoints that affect reproductive or developmental success, organismal viability or growth, or any other endpoint that is, or is directly related to, parameters that influence population dynamics.

"Acute to chronic ratio" or "ACR" is the standard measure of the acute toxicity of a material divided by an appropriate measure of the chronic toxicity of the same material under comparable conditions.

"Acute toxicity" means adverse effects that result from an exposure period that is a small portion of the life span of the organism.

"Adverse effect" means any deleterious effect to organisms due to exposure to a substance. This includes effects that are or may become debilitating, harmful or toxic to the normal functions of the organism, but does not include non-harmful effects such as tissue discoloration alone or the induction of enzymes involved in the metabolism of the substance.

"Baseline BAF" for organic chemicals, means a BAF that is based on the concentration of freely dissolved chemical in the ambient water and takes into account the partitioning of the chemical within the organism; for inorganic chemicals, a BAF is based on the wet weight of the tissue.

"Baseline BCF" for organic chemicals, means a BCF that is based on the concentration of freely dissolved chemical in the ambient water and takes into account the partitioning of the chemical within the organism; for inorganic chemicals, a BAF is based on the wet weight of the tissue.

"Bioaccumulative chemical of concern" or "BCC" is any chemical that has the potential to cause adverse effects and that, upon entering the surface waters, by itself or as its toxic transformation product, accumulates in aquatic organisms by a human health bioaccumulation factor greater than 1,000, after considering metabolism and other physiochemical properties that might enhance or inhibit bioaccumulation, in compliance with the methodology in 35 Ill. Adm. Code 302.570. In addition, the half life of the chemical in the water column, sediment or biota must be greater than eight weeks. BCCs include the following substances:

Chlordane

4,4'-DDD; p,p'-DDD; 4,4'-TDE; p,p'-TDE

4,4'-DDE; p,p'-DDE

4,4'-DDT; p,p'-DDT

Dieldrin

Hexachlorobenzene

Hexachlorobutadiene; Hexachloro-1,3-butadiene

Hexachlorocyclohexanes; BHCs

alpha-Hexachlorocyclohexane; alpha-BHC

beta-Hexachlorocyclohexane; beta-BHC

delta-Hexachlorocyclohexane; delta-BHC

Lindane; gamma-Hexachlorocyclohexane; gamma-BHC

Mercury

Mirex

Octachlorostyrene

PCBs; polychlorinated biphenyls

Pentachlorobenzene

Photomirex

2,3,7,8-TCDD; Dioxin

1,2,3,4-Tetrachlorobenzene

1,2,4,5-Tetrachlorobenzene

Toxaphene

"Bioaccumulation" is the net accumulation of a substance by an organism

as a result of uptake from all environmental sources.

"Bioaccumulation factor" or "BAF" is the ratio (in L/kg) of a substance's concentration in the tissue of an aquatic organism to its concentration in the ambient water, in situations where both the organism and its food are exposed and the ratio does not change substantially over time.

"Bioconcentration" means the net accumulation of a substance by an aquatic organism as a result of uptake directly from the ambient water through gill membranes or other external body surfaces.

"Bioconcentration Factor" or "BCF" is the ratio (in L/kg) of a substance's concentration in the tissue of an aquatic organism to its concentration in the ambient water, in situations where the organism is exposed through the water only and the ratio does not change substantially over time.

"Biota-sediment accumulation factor" or "BSAF" means the ratio (in kg of organic carbon/kg of lipid) of a substance's lipid-normalized concentration in the tissue of an aquatic organism to its organic carbon-normalized concentration in surface sediment, in situations where the ratio does not change substantially over time, both the organism and its food are exposed, and the surface sediment is representative of average surface sediment in the vicinity of the organism.

"Carcinogen" means a substance that causes an increased incidence of benign or malignant neoplasms, or substantially decreases the time to develop neoplasms, in animals or humans. The classification of carcinogens is determined by the procedures in Section II.A of Appendix C to 40 CFR 132, incorporated by reference in 35 Ill. Adm. Code 301.106.

"Chronic effect" means an adverse effect that is measured by assessing an acceptable endpoint, and results from continual exposure over several generations, or at least over a significant part of the test species' projected life span or life stage.

"Chronic toxicity" means adverse effects that result from an exposure period that is a large portion of the life span of the organism.

"Dissolved organic carbon" or "DOC" means organic carbon that passes through a 1 µm pore size filter.

"Dissolved metal" means the concentration of a metal that will pass through a 0.45 µm pore size filter.

"Food chain" means the energy stored by plants is passed along through the ecosystem through trophic levels in a series of steps of eating and being eaten, also known as a food web.

"Food chain multiplier" or "FCM" means the ratio of a BAF to an appropriate BCF.

"Linearized multi-stage model" means a mathematical model for cancer risk assessment. This model fits linear dose-response curves to low doses. It is consistent with a no-threshold model of carcinogenesis.

"Lowest observed adverse effect level" or "LOAEL" means the lowest tested dose or concentration of a substance that results in an observed adverse effect in exposed test organisms when all higher doses or concentrations result in the same or more severe effects.

"No observed adverse effect level" or "NOAEL" means the highest tested dose or concentration of a substance that results in no observed adverse effect in exposed test organisms where higher doses or concentrations result in an adverse effect.

"Octanol water partition coefficient" or "Kow" is the ratio of the concentration of a substance in the n-octanol phase to its concentration in the aqueous phase in an equilibrated two-phase octanol water system. For log Kow, the log of the octanol water partition coefficient is a base 10 logarithm.

"Open Waters of Lake Michigan" means all of the waters within Lake Michigan in Illinois jurisdiction lakeward from a line drawn across the mouth of tributaries to Lake Michigan, but not including waters enclosed by constructed breakwaters.

"Particulate organic carbon" or "POC" means organic carbon that is retained by a 1 µm pore size filter.

"Relative source contribution" or "RSC" means the percent of total exposure that can be attributed to surface water through water intake and fish consumption.

"Resident or indigenous species" means species that currently live a substantial portion of their life cycle, or reproduce, in a given body of water, or that are native species whose historical range includes a given body of water.

"Risk associated dose" or "RAD" means a dose of a known or presumed carcinogenic substance in mg/kg/day which, over a lifetime of exposure, is estimated to be associated with a plausible upper bound incremental cancer risk equal to one in 100,000.

"Slope factor" or "q_1*" is the incremental rate of cancer development calculated through use of a linearized multistage model or other appropriate model. It is expressed in mg/kg/day of exposure to the chemical in question.

"Standard Methods" means "Standard Methods for the Examination of Water and Wastewater", available from the American Public Health Association.

"Subchronic effect" means an adverse effect, measured by assessing an acceptable endpoint, resulting from continual exposure for a period of time less than that deemed necessary for a chronic test.

"Target species" is a species to be protected by the criterion.

"Target species value" is the criterion value for the target species.

"Test species" is a species that has test data available to derive a criterion.

"Test dose" or "TD" is a LOAEL or NOAEL for the test species.

"Tier I criteria" are numeric values derived by use of the Tier I methodologies that either have been adopted as numeric criteria into a water quality standard or are used to implement narrative water quality criteria.

"Tier II values" are numeric values derived by use of the Tier II methodologies that are used to implement narrative water quality criteria. They are applied as criteria, have the same effect, and subject to the same appeal rights as criteria.

"Trophic level" means a functional classification of taxa within a community that is based on feeding relationships. For example, aquatic green plants and herbivores comprise the first and second trophic levels in a food chain.

"Toxic unit acute" or "TU_a" is the reciprocal of the effluent concentration that causes 50 percent of the test organisms to die by the end of the acute exposure period, which is 48 hours for invertebrates and 96 hours for

vertebrates.

"Toxic unit chronic" or "TU_c" is the reciprocal of the effluent concentration that causes no observable effect on the test organisms by the end of the chronic exposure period, which is at least seven days for Ceriodaphnia, fathead minnow and rainbow trout.

"Uncertainty factor" or "UF" is one of several numeric factors used in deriving criteria from experimental data to account for the quality or quantity of the available data.

"USEPA" means United States Environmental Protection Agency.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.502 Dissolved Oxygen

Dissolved oxygen must not be less than 90% of saturation, except due to natural causes, in the Open Waters of Lake Michigan as defined at 35 Ill. Adm. Code 302.501. The other waters of the Lake Michigan Basin must not be less than 6.0 mg/L during at least 16 hours of any 24 hour period, nor less than 5.0 mg/L at any time.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.503 pH

pH must be within the range of 7.0 to 9.0, except for natural causes, in the Open Waters of Lake Michigan as defined at 35 Ill. Adm. Code 302.501. Other waters of the Basin must be within the range of 6.5 to 9.0, except for natural causes.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.504 Chemical Constituents

The following concentrations of chemical constituents must not be exceeded, except as provided in 35 Ill. Adm. Code 302.102 and 302.530:

a) The following standards must be met in all waters of the Lake Michigan Basin. Acute aquatic life standards (AS) must not be exceeded at any time except for those waters for which the Agency has approved a zone of initial dilution (ZID) under 35 Ill. Adm. Code 302.102 and 302.530. Chronic aquatic life standards (CS) and human health standards (HHS) must not be exceeded outside of waters in which mixing is allowed under 35 Ill. Adm. Code 302.102 and 302.530 by the arithmetic average of at least four consecutive samples collected over a period of

at least four days. The samples used to demonstrate compliance with the CS or HHS must be collected in a manner which assures an average representation of the sampling period.

Constituent	Unit	AS	CS	HHS
Arsenic (Trivalent, dissolved)	µg/L	$340 \times 1.0^* = 340$	148 x 1.0*=148	NA
Boron (total)	mg/L	40.1	7.6	NA
Cadmium (dissolved)	µg/L	$\exp[A + B\ln(H)] \times \{1.138672 - [(\ln H)(0.041838)]\}^*$ where A = -3.6867 and B = 1.128	$\exp[A + B\ln(H)] \times \{1.101672 - [(\ln H)(0.041838)]\}^*$ where A = -2.715 and B = 0.7852	NA
Chromium (Hexavalent, total)	µg/L	16	11	NA
Chromium (Trivalent, dissolved)	µg/L	$\exp[A + B\ln(H)] \times 0.316^*$ where A = 3.7256 and B = 0.819	$\exp[A + B\ln(H)] \times 0.860^*$ where A = 0.6848 and B = 0.819	NA
Copper (dissolved)	µg/L	$\exp[A + B\ln(H)] \times 0.960^*$ where A = -1.700 and B = 0.9422	$\exp[A + B\ln(H)] \times 0.960^*$ where A = -1.702 and B = 0.8545	NA
Cyanide**	µg/L	22	5.2	NA
Fluoride (total)	µg/L	$\exp[A + B\ln(H)]$ where A = 6.7319 and B = 0.5394	$\exp[A + B\ln(H)]$, but must not exceed 4.0 mg/L where A = 6.0445 and B = 0.5394	NA

Lead (dissolved)	µg/L	$\exp[A+B\ln(H)]\times\{1.46203-[(\ln H)(0.145712)]\}$* where A = -1.055 and B =1.273	$\exp[A+B\ln(H)]\times\{1.46203-[(\ln H)(0.145712)]\}$* where A = -4.003 and B = 1.273	NA
Manganese (dissolved)	µg/L	$\exp[A+B\ln(H)]\times 0.9812$* where A = 4.9187 and B = 0.7467	$\exp[A+B\ln(H)]\times 0.9812$* where A = 4.0635 and B = 0.7467	NA
Nickel (dissolved)	µg/L	$\exp[A+B\ln(H)]\times 0.998$* where A = 2.255 and B = 0.846	$\exp[A+B\ln(H)]\times 0.997$* where A = 0.0584 and B = 0.846	NA
Selenium (dissolved)	µg/L	NA	5.0	NA
TRC	µg/L	19	11	NA
Zinc (dissolved)	µg/L	$\exp[A+B\ln(H)]\times 0.978$* where A = 0.884 and B = 0.8473	$\exp[A+B\ln(H)]\times 0.986$* where A = 0.884 and B = 0.8473	NA
Benzene	µg/L	3900	800	310
Chlorobenzene	mg/L	NA	NA	3.2
2.4-Dimethylphenol	mg/L	NA	NA	8.7
2,4-Dinitrophenol	mg/L	NA	NA	2.8
Endrin	µg/L	0.086	0.036	NA
Ethylbenzene	µg/L	150	14	NA

Hexachloroethane	µg/L	NA	NA	6.7
Methylene chloride	mg/L	NA	NA	2.6
Parathion	µg/L	0.065	0.013	NA
Pentachlorophenol	µg/L	$\exp B([pH]+A)$ where A = -4.869 and B = 1.005	$\exp B([pH]+A)$ where A = -5.134 and B = 1.005	NA
Toluene	µg/L	2000	610	51.0
Trichloroethylene	µg/L	NA	NA	370
Xylene(s)	µg/L	1200	490	NA

where:

NA = Not Applied

exp[x] = base of natural logarithms raised to the x-power

ln(H) = natural logarithm of Hardness in mg/L as $CaCO_3$

* = conversion factor multiplier for dissolved metals

** = standard to be evaluated using either of the following USEPA approved methods, incorporated by reference at 35 Ill. Adm. Code 301.106: Method OIA-1677, DW: Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry, January 2004, Document Number EPA-821-R-04-001 or Cyanide Amenable to Chlorination, Standard Methods 4500-CN-G (40 CFR 136.3).

b) The following water quality standards must not be exceeded at any time in any waters of the Lake Michigan Basin, unless a different standard is specified under subsection (c).

Constituent		Unit	Water Quality Standard
Barium (total)	01007	mg/L	5.0
Chloride (total)		mg/L	500
Iron (dissolved)		mg/L	1.0

Phenols	mg/L	0.1
Sulfate	mg/L	500
Total Dissolved Solids	mg/L	1000

c) In addition to the standards specified in subsections (a) and (b), the following standards must not be exceeded at any time in the Open Waters of Lake Michigan as defined in Section 302.501.

Constituent	Unit	Water Quality Standard
Arsenic (total)	µg/L	50.0
Boron (total)	mg/L	1.0
Barium (total)	mg/L	1.0
Chloride (total)	mg/L	12.0
Fluoride (total)	mg/L	1.4
Iron (dissolved)	mg/L	0.30
Lead (total)	µg/L	50.0
Manganese (total)	mg/L	0.15
Nitrate-Nitrogen	mg/L	10.0
Phosphorus	µg/L	7.0
Selenium (total)	µg/L	10.0
Sulfate	mg/L	24.0
Total Dissolved Solids	mg/L	180.0
Oil (hexane solubles or equivalent)	mg/L	0.10
Phenols	µg/L	1.0

d) In addition to the standards specified in subsections (a), (b) and (c), the following human health standards (HHS) must not be exceeded in the Open Waters of Lake Michigan as defined in Section 302.501 by the arithmetic average of at least four consecutive samples collected over a period of at least four days. The samples used to demonstrate compliance with the HHS must be collected in a manner which assures an average representation of the sampling period.

Constituent	Unit	Water Quality Standard
Benzene	µg/L	12.0
Chlorobenzene	µg/L	470.0
2,4-Dimethylphenol	µg/L	450.0
2,4-Dinitrophenol	µg/L	55.0
Hexachloroethane (total)	µg/L	5.30
Lindane	µg/L	0.47
Methylene chloride	µg/L	47.0
Trichloroethylene	µg/L	29.0

e) For the following bioaccumulative chemicals of concern (BCCs), acute aquatic life standards (AS) must not be exceeded at any time in any waters of the Lake Michigan Basin and chronic aquatic life standards (CS), human health standards (HHS), and wildlife standards (WS) must not be exceeded in any waters of the Lake Michigan Basin by the arithmetic average of at least four consecutive samples collected over a period of at least four days subject to the limitations of 35 Ill. Adm. Code 302.520 and 302.530. The samples used to demonstrate compliance with the HHS and WS must be collected in a manner that assures an average representation of the sampling period.

Constituent	Unit	AS	CS	HHS	WS
Mercury (total)	ng/L	1,700	910	3.1	1.3
Chlordane	ng/L	NA	NA	0.25	NA
DDT and metabolites	pg/L	NA	NA	150	11.0
Dieldrin	ng/L	240	56	0.0065	NA
Hexachlorobenzene	ng/L	NA	NA	0.45	NA
Lindane	µg/L	0.95	NA	0.5	NA
PCBs (class)	pg/L	NA	NA	26	120
2,3,7,8-TCDD	fg/L	NA	NA	8.6	3.1
Toxaphene	pg/L	NA	NA	68	NA

where:

mg/L = milligrams per liter (10^{-3} grams per liter)

µg/L = micrograms per liter (10^{-6} grams per liter)

ng/L = nanograms per liter (10^{-9} grams per liter)

pg/L = picograms per liter (10^{-12} grams per liter)

fg/L = femtograms per liter (10^{-15} grams per liter)

NA = Not Applied

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.505 Fecal Coliform

Based on a minimum of five samples taken over not more than a 30-day period, fecal coliform must not exceed a geometric mean of 20 per 100 ml in the Open Waters of Lake Michigan as defined in 35 Ill. Adm. Code 302.501. The remaining waters of the Lake Michigan Basin must not exceed a geometric mean of 200 per 100 ml, nor shall more than 10% of the samples during any 30 day period exceed 400 per 100 ml.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.506 Temperature

a) The owner or operator of a source of heated effluent must maintain such records and conduct such studies of the effluents from the source and its effects as may be required by the Agency or in any permit granted under the Act.

b) Backfitting of alternative cooling facilities will be required if, upon complaint filed in compliance with Board rules, it is found at any time that any heated effluent causes significant ecological damage to the Lake.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.507 Thermal Standards for Existing Sources on January 1, 1971

All sources of heated effluents in existence as of January 1, 1971, must meet the following restrictions outside of a mixing zone which must be no greater than a circle with a radius of 305 m (1000 feet) or an equal fixed area of simple form.

a) There must be no abnormal temperature changes that may affect aquatic life.

b) The normal daily and seasonal temperature fluctuations that existed before the addition of heat must be maintained.

c) The maximum temperature rise at any time above natural temperatures must not exceed 1.7 ºC (3 ºF). In addition, the water temperature must not exceed the maximum limits indicated in the following table:

	° C	° F		° C	° F
JAN.	7	45	JUL.	27	80
FEB.	7	45	AUG.	27	80
MAR.	7	45	SEPT.	27	80
APR.	13	55	OCT.	18	65
MAY	16	60	NOV.	16	60
JUN.	21	70	DEC.	10	50

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.508 Thermal Standards for Sources Under Construction But Not In Operation on January 1, 1971

Any effluent source under construction but not in operation on January 1, 1971 must meet all the requirements of 35 Ill. Adm. Code 302.507 and in addition must meet the following restrictions:

a) The bottom, the shore, the hypolimnion, and the thermocline must not be affected by any heated effluent.

b) Heated effluent must not affect spawning grounds or fish migration routes.

c) Discharge structures must be designed to maximize short-term mixing and thus to reduce the area significantly raised in temperature.

d) Discharge must not exceed ambient temperatures by more than 11 ºC (20 ºF).

e) Heated effluents from more than one source must not interact.

f) All reasonable steps must be taken to reduce the number of organisms drawn into or against the intakes.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.509 Other Sources

a) A source of heated effluent which was not in operation or under construction as of

January 1, 1971, must not discharge more than a daily average of 29 megawatts (0.1 billion British thermal units per hour).

b) Sources of heated effluents which discharge less than a daily average of 29 megawatts (0.1 billion British thermal units per hour) not in operation or under construction as of January 1, 1971, must meet all requirements of 35 Ill. Adm. Code 302.507 and 302.508.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.510 Incorporations by Reference (Repealed)

(Source: Repealed at 46 Ill. Reg. _____, effective _____)

Section 302.515 Offensive Conditions

Waters of the Lake Michigan Basin must be free from sludge or bottom deposits, floating debris, visible oil, odor, plant or algal growth, color or turbidity of other than natural origin. The allowed mixing provisions of 35 Ill. Adm. Code 302.102 must not be used to comply with the provisions of this Section.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.520 Regulation and Designation of Bioaccumulative Chemicals of Concern (BCCs)

a) For regulating BCCs in compliance with 35 Ill. Adm. Code 302.521 and 302.530, the following chemicals must be considered as BCCs:

1) any chemical or class of chemicals listed as a BCC in 35 Ill. Adm. Code 302.501; and

2) any chemical or class of chemicals that the Agency has determined meets the characteristics of a BCC as defined in 35 Ill. Adm. Code 302.501 as indicated by:

A) publication in the Illinois Register; or

B) notification to a permittee or applicant; or

C) filing a petition with the Board to verify that the chemical must be designated a BCC.

b) Notwithstanding subsections (a)(2)(A) and (B), a chemical must not be regulated

as a BCC if the Agency has not filed a petition, within 60 days after such publication or notification, with the Board in compliance with Section 28.2 of the Act to verify that the chemical must be designated a BCC.

c) Under subsection (b) and 35 Ill. Adm. Code 302.570, if the Board verifies that a chemical has a human health bioaccumulation factor greater than 1,000 and is consistent with the definition of a BCC in 35 Ill. Adm. Code 302.501, the Board must designate the chemical as a BCC and list the chemical in 35 Ill. Adm. Code 302.501. If the Board fails to verify the chemical as a BCC in its final action on the verification petition, the chemical must not be listed as a BCC and must not be regulated as a BCC in compliance with 35 Ill. Adm. Code 302.521 and 302.530.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.521 Supplemental Antidegradation Provisions for BCCs

a) Notwithstanding the provisions of 35 Ill. Adm. Code 302.105, waters within the Lake Michigan Basin must not be lowered in quality due to new or increased loading of substances defined as BCCs in 35 Ill. Adm. Code 302.501 from any source or activity subject to the NPDES permitting, Section 401 water quality certification provisions of the Clean Water Act (P.L. 92-100, as amended), or joint permits from the Agency and the Illinois Department of Natural Resources under Section 39(n) of the Act [415 ILCS 5/39(n)] until and unless it can be affirmatively demonstrated that such change is necessary to accommodate important economic or social development.

1) Where ambient concentrations of a BCC are equal to or exceed an applicable water quality criterion, no increase in loading of that BCC is allowed.

2) Where ambient concentrations of a BCC are below the applicable water quality criterion, a demonstration to justify increased loading of that BCC must include the following:

A) Pollution Prevention Alternatives Analysis. Identify any cost-effective reasonably available pollution prevention alternatives and techniques that would eliminate or significantly reduce the extent of increased loading of the BCC.

B) Alternative or Enhanced Treatment Analysis. Identify alternative or enhanced treatment techniques that are cost effective and reasonably available to the entity that would eliminate or significantly reduce the extent of increased loading of the BCC.

C) Important Social or Economic Development Analysis. Identify the social or economic development and the benefits that would be forgone if the increased loading of the BCC is not allowed.

3) In no case will increased loading of BCCs result in exceeding applicable water quality criteria or concentrations exceeding the level of water quality necessary to protect existing uses.

4) Changes in loadings of any BCC within the existing capacity and processes of an existing NPDES authorized discharge, certified activity under Section 401 of the Clean Water Act, or joint permits from the Agency and the Illinois Department of Natural Resources under Section 39(n) of the Act are not subject to the antidegradation review of subsection (a). These changes include:

A) normal operational variability, including intermittent increased discharges due to wet weather conditions;

B) changes in intake water pollutants;

C) increasing the production hours of the facility; or

D) increasing the rate of production.

5) Any determination to allow increased loading of a BCC based on a demonstration of important economic or social development need must satisfy the public participation requirements of 40 CFR 25 prior to final issuance of the NPDES permit, Section 401 water quality certification, or joint permits from the Agency and the Illinois Department of Natural Resources under Section 39(n) of the Act.

b) The following actions are not subject to the provisions of subsection (a), unless the Agency determines the circumstances of an individual situation warrant application of those provisions to adequately protect water quality:

1) Short-term, temporary (i.e., weeks or months) lowering of water quality;

2) Bypasses that are not prohibited at 40 CFR 122.41(m), incorporated by reference in 35 Ill. Adm. Code 301.106; or

3) Response actions under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, or similar federal or State authority, undertaken to alleviate a release into the environment of hazardous substances, pollutants or contaminants that pose

danger to public health or welfare.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.525 Radioactivity

Except as provided in 35 Ill. Adm. Code 302.102, all waters of the Lake Michigan Basin must meet the following concentrations:

a) Gross beta concentrations must not exceed 100 picocuries per liter (pCi/L).

b) Strontium 90 concentration must not exceed 2 picocuries per liter (pCi/L).

c) The annual average radium 226 and 228 combined concentration must not exceed 3.75 picocuries per liter (pCi/L).

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.530 Supplemental Mixing Provisions for Bioaccumulative Chemicals of Concern (BCCs)

The Allowed Mixing, Mixing Zones, and ZIDs provisions of 35 Ill. Adm. Code 302.102 apply within the Lake Michigan Basin except as otherwise provided for substances defined as BCCs in 35 Ill. Adm. Code 302.501:

a) Mixing is not allowed for BCCs for new discharges commencing on or after December 24, 1997.

b) Discharges of BCCs existing as of December 24, 1997 are eligible for mixing allowance consistent with 35 Ill. Adm. Code 302.102 until March 23, 2007. After March 23, 2007 mixing for BCCs will not be allowed except as provided in subsections (c) and (d).

c) Mixing allowance for a source in existence on December 24, 1997 may continue beyond March 23, 2007 where it can be demonstrated on a case by case basis that continuation of mixing allowance is necessary to achieve water conservation measures that result in overall reduction of BCC mass loading to the Lake Michigan Basin.

d) Mixing allowance for a source in existence on December 24, 1997 will only continue if necessitated by technical and economic factors. Any mixing allowance continued beyond March 23, 2007 based on technical and economic factors must be limited to not more than one NPDES permit term, and must reflect the maximum achievable BCC loading reduction within the identified technical and

economic considerations necessitating the exception. The continued mixing allowance must not be renewed beyond that permit term unless a new determination of technical and economic necessity is made.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.535 Ammonia Nitrogen

The Open Waters of Lake Michigan as defined in 35 Ill. Adm. Code 302.501 must not exceed 0.02 mg/L total ammonia. The remaining waters of the Lake Michigan Basin are subject to the following:

a) Total ammonia nitrogen must in no case exceed 15 mg/L.

b) Un-ionized ammonia nitrogen must not exceed the acute and chronic standards given below subject to the provisions of 35 Ill. Adm. Code 302.208(a) and (b):

1) From April through October, the Acute Standard (AS) must be 0.33 mg/L and the chronic standard (CS) must be 0.057 mg/L.

2) From November through March, the AS must be 0.14 mg/L and the CS must be 0.025 mg/L.

c) For this Section, the concentration of un-ionized ammonia nitrogen as N and total ammonia as N must be computed according to the following equations:

$$U = \frac{N}{[0.94412(1 + 10^{X}) + 0.0559]}$$

and $N = U[0.94412(1 + 10^{X}) + 0.0559]$

Where:

$$X = 0.09018 + \frac{2729.92}{(T + 273.16)} - pH$$

U = Concentration of un-ionized ammonia as N in mg/L

N = Concentration of ammonia nitrogen as N in mg/L

T = Temperature in degrees Celsius.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.540 Other Toxic Substances

Waters of the Lake Michigan Basin must be free from any substance or any combination of substances in concentrations toxic or harmful to human health, or to animal, plant or aquatic life. The numeric standards protective of particular uses specified for individual chemical substances in 35 Ill. Adm. Code 302.504 are not subject to recalculation by this Section, however, where no standard applies to a category, a numeric value may be calculated.

a) Any substance will be deemed toxic or harmful to aquatic life if present in concentrations that exceed the following:

1) A Tier I Lake Michigan Basin Acute Aquatic Life Toxicity Criterion (LMAATC) or Tier II Lake Michigan Basin Acute Aquatic Life Toxicity Value (LMAATV) derived under procedures in 35 Ill. Adm. Code 302.555, 302.560 or 302.563 at any time; or

2) A Tier I Lake Michigan Basin Chronic Aquatic Life Toxicity Criterion (LMCATC) or Tier II Lake Michigan Basin Chronic Aquatic Life Toxicity Value (LMCATV) derived under procedures in 35 Ill. Adm. Code 302.565 as an average of four samples collected on four different days.

b) Any combination of substances, including effluents, will be deemed toxic to aquatic life if present in concentrations that exceed either subsection (b)(1) or (2):

1) A sample of water from the Lake Michigan Basin collected outside of a designated zone of initial dilution must not exceed 0.3 TU_a as determined for the most sensitive species tested using acute toxicity testing methods.

2) A sample of water from the Lake Michigan Basin collected outside a designated mixing zone must not exceed 1.0 TU_c as determined for the most sensitive species tested using chronic toxicity testing methods.

3) To demonstrate compliance with subsections (1) and (2), at least two resident or indigenous species must be tested. The rainbow trout must be used to represent fishes for the Open Waters of Lake Michigan and the fathead minnow must represent fishes for the other waters of the Lake Michigan Basin. Ceriodaphnia must represent invertebrates for all waters of the Lake Michigan Basin. Other common species may be used if listed in Table I (a) of 40 CFR 136, incorporated by reference at 35 Ill. Adm. Code 301.106, and approved by the Agency.

c) Any substance must be deemed toxic or harmful to wildlife if present in concentrations that exceed a Tier I Lake Michigan Basin Wildlife Criterion (LMWLC) derived under procedures in 35 Ill. Adm. Code 302.575 as an arithmetic average of four samples collected over four different days.

d) For any substance that is a threat to human health through drinking water exposure only, the resulting criterion or value must apply to only the Open Waters of Lake Michigan. For any substance that is determined to be a BCC, the resulting criterion must apply in the entire Lake Michigan Basin. These substances must be deemed toxic or harmful to human health if present in concentrations that exceed either of the following:

1) A Tier I Lake Michigan Basin Human Health Threshold Criterion (LMHHTC) or Tier II Lake Michigan Basin Human Health Threshold Value (LMHHTV) based on disease or functional impairment due to a physiological mechanism for which there is a threshold dose below which no damage occurs as derived under procedures in 35 Ill. Adm. Code 302.585 as an arithmetic average of four samples collected over four different days; or

2) A Tier I Lake Michigan Basin Human Health Nonthreshold Criterion (LMHHNC) or Tier II Lake Michigan Basin Human Health Nonthreshold Value (LMHHNV) based on disease or functional impairment due to a physiological mechanism for which any dose may cause some risk of damage as derived under procedures in 35 Ill. Adm. Code 302.590 as an arithmetic average of four samples collected over four different days.

e) The derived criteria and values apply at all points outside of any waters in which mixing is allowed under 35 Ill. Adm. Code 302.102 or 302.530.

f) The procedures of this Subpart E set forth minimum data requirements, appropriate test protocols and data assessment methods for establishing criteria or values under subsections (b), (c), and (d). No other procedures may be used to establish such criteria or values unless approved by the Board in a rulemaking or adjusted standards proceeding under Title VII of the Act. The validity and applicability of these procedures may not be challenged in any proceeding brought under Title VIII or X of the Act, although the validity and correctness of application of the numeric criteria or values derived under this Subpart may be challenged in such proceedings under subsection (g).

g) Challenges to application of criteria and values.

1) A permittee may challenge the validity and correctness of application of a criterion or value derived by the Agency under this Section only at the time such criterion or value is first applied in its NPDES permit under 35 Ill. Adm. Code 309.152 or in an action under Title VIII of the Act for violation of the toxicity water quality standard. Failure of a person to challenge the validity of a criterion or value at the time of its first

application to that person's facility constitutes a waiver of a challenge in any subsequent proceeding involving application of the criterion or value to that person.

2) Consistent with subsection (g)(1), if a criterion or value is included as, or is used to derive, a condition of an NPDES discharge permit, a permittee may challenge the criterion or value in a permit appeal under 35 Ill. Adm. Code 309.181.

3) Consistent with subsection (g)(1), in an action where alleged violation of the toxicity water quality standard is based on alleged excursion of a criterion or value, the person bringing the action has the burdens of going forward with proof and persuasion regarding the general validity and correctness of application of the criterion or value.

h) Subsections (a) through (e) do not apply to USEPA registered pesticides approved for aquatic application and applied under the following conditions:

1) Application must be made in strict compliance with label directions;

2) Applicator must be properly certified under the provisions of the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 135 et seq. (1972));

3) Applications of aquatic pesticides must comply with the laws, regulations and guidelines of all State and federal agencies authorized by law to regulate, use or supervise pesticide applications;

4) Aquatic pesticide must not be applied to waters affecting public or food processing water supplies unless a permit to apply the pesticide has been obtained from the Agency. All permits must be issued so as not to cause a violation of the Act or of any of the Board's rules. To aid applicators in determining their responsibilities under this subsection (h), a list of waters affecting public water supplies will be published and maintained by the Agency's Division of Public Water Supplies.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.545 Data Requirements

The Agency must review, for validity, applicability and completeness the data used in calculating criteria or values. To the extent available, and to the extent not otherwise specified, testing procedures, selection of test species and other aspects of data acquisition must be according to methods published by USEPA or nationally recognized standards of organizations, including those methods found in Standard Methods, incorporated by reference in 35 Ill. Adm.

Code 301.106, or recommended in 40 CFR 132, incorporated by reference in 35 Ill. Adm. Code 301.106.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.550 Analytical Testing

All methods of sample collection, preservation, and analysis used in applying any of the requirements of this Subpart must be consistent with the methods published by USEPA or nationally recognized standards of organizations, including those methods found in Standard Methods, incorporated by reference in 35 Ill. Adm. Code 301.106, or recommended in 40 CFR 132 and incorporated by reference in 35 Ill. Adm. Code 301.106.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.553 Determining the Lake Michigan Aquatic Toxicity Criteria or Values − General Procedures

The Lake Michigan Aquatic Life Criteria and Values are those concentrations or levels of a substance at which aquatic life is protected from adverse effects resulting from short or long term exposure in water.

a) Tier I criteria and Tier II values to protect against acute effects in aquatic organisms will be calculated according to procedures listed at 35 Ill. Adm. Code 302.555, 302.560 and 302.563. The procedures of 35 Ill. Adm. Code 302.560 must be used as necessary to allow for interactions with other water quality characteristics such as hardness, pH, temperature, etc. Tier I criteria and Tier II values to protect against chronic effects in aquatic organisms must be calculated according to the procedures listed at 35 Ill. Adm. Code 302.565.

b) Minimum data requirements. In order to derive a Tier I acute or chronic criterion, data must be available for at least one species of freshwater animal in at least eight different families such that the following taxa are included:

1) The family Salmonidae in the class Osteichthyes;

2) One other family in the class Osteichthyes;

3) A third family in the phylum Chordata;

4) A planktonic crustacean;

5) A benthic crustacean;

6) An insect;

7) A family in a phylum other than Arthropoda or Chordata; and

8) A family from any order of insect or any phylum not already represented.

c) Data for tests with plants, if available, must be included in the data set.

d) If data for acute effects are not available for all the eight families listed above, but are available for the family Daphnidae, a Tier II value must be derived according to procedures in 35 Ill. Adm. Code 302.563. If data for chronic effects are not available for all the eight families, but there are acute and chronic data available according to 35 Ill. Adm. Code 302.565(b) so that three acute to chronic ratios (ACRs) can be calculated, then a Tier I chronic criterion can be derived according to procedures in 35 Ill. Adm. Code 302.565. If three ACRs are not available, then a Tier II chronic value can be derived according to procedures in 35 Ill. Adm. Code 302.565(b).

e) Data must be obtained from species that have reproducing wild populations in North America except that data from salt water species can be used in the derivation of an ACR.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.555 Determining the Tier I Lake Michigan Acute Aquatic Toxicity Criterion (LMAATC): Independent of Water Chemistry

If the acute toxicity of the chemical has not been shown to be related to a water quality characteristic, including hardness, pH, or temperature, the Tier I LMAATC is calculated using the procedures below.

a) For each species for which more than one acute value is available, the Species Mean Acute Value (SMAV) is calculated as the geometric mean of the acute values from all tests.

b) For each genus for which one or more SMAVs are available, the Genus Mean Acute Value (GMAV) is calculated as the geometric mean of the SMAVs available for the genus.

c) The GMAVs are ordered from high to low in numerical order.

d) Ranks (R) are assigned to the GMAVs from "1" for the lowest to "N" for the highest. If two or more GMAVs are identical, successive ranks are arbitrarily assigned.

e) The cumulative probability, P, is calculated for each GMAV as R/(N+1).

f) The GMAVs to be used in the calculations of subsection (g) must be those with cumulative probabilities closest to 0.05. If there are fewer than 59 GMAVs in the total data set, the values utilized must be the lowest four obtained through the ranking procedures of subsections (c) and (d).

g) Using the GMAVs identified under subsection (f) and the Ps calculated under subsection (e), the Final Acute Value (FAV) and the LMAATC are calculated as:

$$FAV = \exp(A) \text{ and}$$
$$LMAATC = FAV/2$$

Where:

$$A = L + 0.2236\ S$$
$$L = [\Sigma(\ln GMAV) - S(\Sigma(P(0.5)))]/4$$
$$S = [[\Sigma((\ln GMAV)^2) - ((\Sigma(\ln GMAV))^2)/4] / [\Sigma(P) - ((\Sigma(P^{0.5}))^2)/4]]^{0.5}$$

h) If a resident or indigenous species, whose presence is necessary to sustain commercial or recreational activities, will not be protected by the calculated FAV, then the SMAV for that species is used as the FAV.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.560 Determining the Tier I Lake Michigan Basin Acute Aquatic Life Toxicity Criterion (LMAATC): Dependent on Water Chemistry

If data are available to show that a relationship exists between a water quality characteristic (WQC) and acute toxicity to two or more species, a Tier I LMAATC must be calculated using procedures in this Section. Although the relationship between hardness and acute toxicity is typically non-linear, it can be linearized by a logarithmic transformation (i.e., for any variable, K, f(K) = logarithm of K) of the variables and plotting the logarithm of hardness against the logarithm of acute toxicity. Similarly, relationships between acute toxicity and other water quality characteristics, such as pH or temperature, may require a transformation, including no transformation (i.e., for any variable, K, f(K) = K) for one or both variables to obtain least squares linear regression of the transformed acute toxicity values on the transformed values of the water quality characteristic. An LMAATC is calculated using the following procedures.

a) For each species for which acute toxicity values are available at two or more different values of the water quality characteristic, a linear least squares regression of the transformed acute toxicity (TAT) values on the transformed

water quality characteristic (TWQC) values is performed to obtain the slope of the line describing the relationship.

b) Each of the slopes determined under subsection (a) is evaluated as to whether it is statistically valid, considering the range and number of tested values of the water quality characteristic and the degree of agreement within and between species. If slopes are not available for at least one fish and one invertebrate species, or if the available slopes are too dissimilar or if too few data are available to define the relationship between acute toxicity and the water quality characteristic, then the LMAATC must be calculated using the procedures in 35 Ill. Adm. Code 302.555.

c) Normalize the TAT values for each species by subtracting W, the arithmetic mean of the TAT values of a species, from each of the TAT values used in the determination of the mean, such that the arithmetic mean of the normalized TAT values for each species individually or for any combination of species is zero (0.0).

d) Normalize the TWQC values for each species using X, the arithmetic mean of the TWQC values of a species, in the same manner as in subsection (c).

e) Group all the normalized data by treating them as if they were from a single species and perform a least squares linear regression of all the normalized TAT values on the corresponding normalized TWQC values to obtain the pooled acute slope, V.

f) For each species, the graphical intercept representing the species TAT intercept, f(Y), at a specific selected value, Z, of the WQC is calculated using the equation:

$$f(Y) = W - V(X - g(Z))$$

Where:

- f() is the transformation used to convert acute toxicity values to TAT values
- Y is the species acute toxicity intercept or species acute intercept
- W is the arithmetic mean of the TAT values as specified in subsection (c)
- V is the pooled acute slope as specified in subsection (e)
- X is the arithmetic mean of the TWQC values as specified in subsection (c)
- g() is the transformation used to convert the WQC values to TWQC values
- Z is a selected value of the WQC

g) For each species, determine the species acute intercept, Y, by carrying out an inverse transformation of the species TAT value, f(Y). For example, in the case of a logarithmic transformation, Y = antilogarithm of (f(Y)); or in the case where no transformation is used, Y = f(Y).

h) The Final Acute Intercept (FAI) is derived by using the species acute intercepts, obtained from subsection (f), in compliance with the procedures described in 35 Ill. Adm. Code 302.555(b) through (g), with the word "value" replaced by the word "intercept". Note that in this procedure geometric means and natural logarithms are always used.

i) The Aquatic Acute Intercept (AAI) is obtained by dividing the FAI by two. If, for a commercially or recreationally important species, the geometric mean of the acute values at Z is lower than the FAV at Z, then the geometric mean of that species must be used as the FAV.

j) The LMAATC at any value of the WQC, denoted by WQCx, is calculated using the terms defined in subsection (f) and the equation:

$$LMAATC = \exp[V(g(WQCx) - g(Z)) + f(AAI)]$$

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.563 Determining the Tier II Lake Michigan Basin Acute Aquatic Life Toxicity Value (LMAATV)

If all eight minimum data requirements for calculating a FAV using Tier I procedures are not met, a Tier II LMAATV must be calculated for a substance as follows:

a) The lowest GMAV in the database is divided by the Secondary Acute Factor (SAF) corresponding to the number of satisfied minimum data requirements listed in the Tier I methodology (35 Ill. Adm. Code 302.553). In order to calculate a Tier II LMAATV, the data base must contain, at a minimum, a GMAV for one of the following three genera in the family Daphnidae – *Ceriodaphnia* sp., *Daphnia* sp., or *Simocephalus* sp. The Secondary Acute Factors are:

Number of Minimum data requirements satisfied (required taxa)	Secondary Acute Factor
1	43.8
2	26.0

3	16.0
4	14.0
5	12.2
6	10.4
7	8.6

b) If dependent on a water quality characteristic, the Tier II LMAATV must be calculated according to 35 Ill. Adm. Code 302.560.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.565 Determining the Lake Michigan Basin Chronic Aquatic Life Toxicity Criterion (LMCATC) or the Lake Michigan Basin Chronic Aquatic Life Toxicity Value (LMCATV)

a) Determining Tier I LMCATC

1) When chronic toxicity data are available for at least eight resident or indigenous species from eight different North American genera of freshwater organisms as specified in 35 Ill. Adm. Code 302.553, a Tier I LMCATC is derived in the same manner as the FAV in 35 Ill. Adm. Code 302.555 or 302.560 by substituting LMCATC for FAV or FAI, chronic for acute, SMCV (Species Mean Chronic Value) for SMAV, and GMCV (Genus Mean Chronic Value) for GMAV.

2) If data are not available to meet the requirements of subsection (a), a Tier I LMCATC is calculated by dividing the FAV by the geometric mean of the acute-chronic ratios (ACRs) obtained from at least one species of aquatic animal from at least three different families provided that of the three species:

A) At least one is a fish;

B) At least one is an invertebrate; and

C) At least one species is an acutely sensitive freshwater species if the other two are saltwater species.

3) The acute-chronic ratio (ACR) for a species equals the acute toxicity concentration from data considered under 35 Ill. Adm. Code 302.555 or

302.560, divided by the chronic toxicity concentration.

4) If a resident or indigenous species whose presence is necessary to sustain commercial or recreational activities will not be protected by the calculated LMCATC, then the SMCV for that species is used as the CATC.

b) Determining the Tier II LMCATV

1) If all eight minimum data requirements for calculating a FCV using Tier I procedures are not met, or if there are not enough data for all three ACRs, a Tier II Lake Michigan Chronic Aquatic Life Toxicity Value must be calculated using a secondary acute chronic ratio (SACR) determined as follows:

A) If fewer than three valid experimentally determined ACRs are available:

i) Use sufficient ACRs of 18 so that the total number of ACRs equals three; and

ii) Calculate the Secondary Acute-Chronic Ratio as the geometric mean of the three ACRs; or

B) If no experimentally determined ACRs are available, the SACR is 18.

2) Calculate the Tier II LMCATV using one of the following equations:

A) Tier II LMCATV = FAV / SACR

B) Tier II LMCATV = SAV / FACR

C) Tier II LMCATV = SAV / SACR

Where:

the SAV equals 2 times the value of the Tier II LMAATV calculated in 35 Ill. Adm. Code 302.563

3) If, for a commercially or recreationally important species, the SMCV is lower than the calculated Tier II LMCATV, then the SMCV must be used as the Tier II LMCATV.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.570 Procedures for Deriving Bioaccumulation Factors for the Lake Michigan Basin

A bioaccumulation factor (BAF) is used to relate the concentration of a substance in an aquatic organism to the concentration of the substance in the waters in which the organism resides when all routes of exposure (ambient water and food) are included. A BAF is used in the derivation of water quality criteria to protect wildlife and criteria and values to protect human health.

a) Selection of data. BAFs can be obtained or developed from one of the following methods, listed in order of preference.

1) Field-measured BAF.

2) Field-measured biota-sediment accumulation factor (BSAF).

3) Laboratory-measured bioconcentration factor (BCF).
The concentration of particulate organic carbon (POC) and dissolved organic carbon (DOC) in the test solution must be either measured or reliably estimated.

4) Predicted BCF.

Predicted baseline BCF = Kow.

b) Calculation of baseline BAFs for organic chemicals.
The most preferred BAF or BCF from above is used to calculate a baseline BAF which in turn is utilized to derive a human health or wildlife specific BAF.

1) Procedures for determining the necessary elements of baseline calculation.

A) Lipid normalization. The lipid-normalized concentration, C_l, of a chemical in tissue is defined using the following equation:

$$C_l = C_b / f_l$$

Where:

C_b = concentration of the organic chemical in the tissue of aquatic biota (either whole organism or specified tissue) (µg/g)
f_l = fraction of the tissue that is lipid

B) Bioavailability.
The fraction of the total chemical in the ambient water that is freely dissolved, f_{fd}, must be calculated using the following equation:

$$f_{fd} = 1 / \{1 + [(DOC)(Kow)/10] + [(POC)(Kow)]\}$$

Where:

DOC = concentration of dissolved organic carbon, kg of dissolved organic carbon/L of water
Kow = octanol-water partition coefficient of the chemical
POC = concentration of particulate organic carbon, kg of particulate organic carbon/L of water

C) Food Chain Multiplier (FCM). For an organic chemical, the FCM used must be taken from Table B-1 in Appendix B of 40 CFR 132 incorporated by reference at 35 Ill. Adm. Code 301.106.

2) Calculation of baseline BAFs.

A) From field-measured BAFs:

$$\text{Baseline BAF} = \{ [\text{measured } BAF_{tT} / f_{fd}] - 1 \} \{ 1 / f_l \}$$

Where:

BAF_{tT} = BAF based on total concentration in tissue and water of study organism and site
f_l = fraction of the tissue of study organism that is lipid
f_{fd} = fraction of the total chemical that is freely dissolved in the ambient water

B) From a field measured biota-sediment accumulation factor (BSAF):

$$(\text{Baseline BAF})_i = (\text{baseline BAF})_r \, (BSAF)_i \, (Kow)_i / (BSAF)_r \, (Kow)_r$$

Where:

$(BSAF)_i$ = BSAF for chemical "$_i$"

$(BSAF)_r$ = BSAF for the reference chemical "$_r$"

$(KOW)_i$ = octanol-water partition coefficient for chemical "$_i$"

(KOW)r = octanol-water partition coefficient for the reference chemical "$_r$"

i) A BSAF must be calculated using the following equation:

$$BSAF = C_l / C_{soc}$$

Where:

C_l = the lipid-normalized concentration of the chemical in tissue

C_{soc} = the organic carbon-normalized concentration of the chemical in sediment

ii) The organic carbon-normalized concentration of a chemical in sediment, C_{soc}, must be calculated using the following equation:

$$C_{soc} = C_s / f_{oc}$$

Where:

C_s = concentration of chemical in sediment (µg/g sediment)

f_{oc} = fraction of the sediment that is organic carbon

C) From a laboratory-measured BCF:

$$\text{baseline BAF} = (FCM) \{ [\text{measured } BCF_{tT} / f_{fd}] - 1 \} \{ 1 / f_l \}$$

Where:

BCF_{tT} = BCF based on total concentration in tissue and water.

f_l = fraction of the tissue that is lipid

f_{fd} = fraction of the total chemical in the test water that is freely dissolved

FCM = the food-chain multiplier obtained from Table B-1 in Appendix B of 40 CFR 132, incorporated by reference at 35 Ill. Adm. Code 301.106, by linear

interpolation for trophic level 3 or 4, as necessary

D) From a predicted BCF:

baseline BAF = (FCM) (predicted baseline BCF) = (FCM)(Kow)

Where:

FCM = the food-chain multiplier obtained from Table B-1 in Appendix B of 40 CFR 132, incorporated by reference at 35 Ill. Adm. Code 301.106 302.510, by linear interpolation for trophic level 3 or 4, as necessary

Kow = octanol-water partition coefficient

c) Human health and wildlife BAFs for organic chemicals:

1) Fraction freely dissolved (f_{fd}). By using the equation in subsection (b)(1)(B), the f_{fd} to be used to calculate human health and wildlife BAFs for an organic chemical must be calculated using a standard POC concentration of 0.00000004 kg/L and a standard DOC concentration of 0.000002 kg/L:

$$f_{fd} = 1 / [1+ (0.00000024 \text{ kg/L})(Kow)]$$

2) Human health BAF. The human health BAFs for an organic chemical must be calculated using the following equations:

A) For trophic level 3:

$$\text{Human Health BAF}_{HHTL3} = [(\text{baseline BAF})(0.0182) + 1] (f_{fd})$$

B) For trophic level 4:

$$\text{Human Health BAF}_{HHTL4} = [(\text{baseline BAF}) (0.0310) + 1] (f_{fd})$$

Where:

0.0182 and 0.0310 are the standardized fraction lipid values for trophic levels 3 and 4, respectively, that are used to derive human health criteria and values

3) Wildlife BAF. The wildlife BAFs for an organic chemical must be

calculated using the following equations:

A) For trophic level 3:

Wildlife BAF_{WLTL3} = [(baseline BAF)(0.0646) +1] (f_{fd})

B) For trophic level 4:

Wildlife BAF_{WLTL4} = [(baseline BAF)(0.1031) + 1] (f_{fd})

Where:

0.0646 and 0.1031 are the standardized fraction lipid values for trophic levels 3 and 4, respectively, that are used to derive wildlife criteria

d) Human health and wildlife BAFs for inorganic chemicals. For inorganic chemicals the baseline BAFs for trophic levels 3 and 4 are both assumed to equal the BCF determined for the chemical with fish.

1) Human health. Measured BAFs and BCFs used to determine human health BAFs for inorganic chemicals must be based on concentration in edible tissue (e.g., muscle) of freshwater fish.

2) Wildlife. Measured BAFs and BCFs used to determine wildlife BAFs for inorganic chemicals must be based on concentration in the whole body of freshwater fish and invertebrates.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.575 Procedures for Deriving Tier I Water Quality Criteria and Values in the Lake Michigan Basin to Protect Wildlife

The Lake Michigan Basin Wildlife Criterion (LMWC) is the concentration of a substance which if not exceeded protects Illinois wild mammal and bird populations from adverse effects resulting from ingestion of surface waters of the Lake Michigan Basin and from ingestion of aquatic prey organisms taken from surface waters of the Lake Michigan Basin. Wildlife criteria calculated under this Section protect against long-term effects and are therefore considered chronic criteria. The methodology involves utilization of data from test animals to derive criteria to protect representative or target species: bald eagle, herring gull, belted kingfisher, mink and river otter. The lower of the geometric mean of species specific criteria for bird species or mammal species is chosen as the LMWC to protect a broad range of species.

a) This method must also be used for non-BCCs when appropriately modified to

consider the following factors:

1) Selection of scientifically justified target species;

2) Relevant routes of chemical exposure;

3) Pertinent toxicity endpoints.

b) Minimum data requirements:

1) Test dose (TD). In order to calculate a LMWC the following minimal data base is required:

A) There must be at least one data set showing dose-response for oral, subchronic, or chronic exposure of 28 days for one bird species; and

B) There must be at least one data set showing dose-response for oral, subchronic, or chronic exposure of 90 days for one mammal species.

2) Bioaccumulation Factor (BAF) data requirements:

A) For any chemical with a BAF of less than 125 the BAF may be obtained by any method; and

B) For chemicals with a BAF of greater than 125 the BAF must come from a field measured BAF or Biota-Sediment Accumulation Factor (BSAF).

c) Principles for development of criteria

1) Dose standardization. The data for the test species must be expressed as, or converted to, the form mg/kg/d utilizing the guidelines for drinking and feeding rates and other procedures in 40 CFR 132, incorporated by reference in 35 Ill. Adm. Code 301.106.

2) Uncertainty factors (UF) for utilizing test dose data in the calculation of the target species value (TSV);

A) Correction for intermittent exposure. If the animals used in a study were not exposed to the toxicant each day of the test period, the no observed adverse effect level (NOAEL) must be multiplied by the ratio of days of exposure to the total days in the test period.

B) Correction from the lowest observed adverse effect level (LOAEL) to NOAEL (UF_l). For those substances for which a LOAEL has been derived, the UF_l must not be less than one and should not exceed 10.

C) Correction for subchronic to chronic extrapolation (UF_s). In instances where only subchronic data are available, the TD may be derived from subchronic data. The value of the UF_s must not be less than one and should not exceed 10.

D) Correction for interspecies extrapolations (UF_a). For the derivation of criteria, a UF_a must not be less than one and should not exceed 100. The UF_a must be used only for extrapolating toxicity data across species within a taxonomic class. A species specific UF_a must be selected and applied to each target species, consistent with the equation in subsection (d).

d) Calculation of TSV. The TSV, measured in milligrams per liter (mg/L), is calculated according to the equation:

$$TSV = \{[TD \times Wt] / [UF_a \times UF_s \times UF_l]\} \quad / \quad \{W + \Sigma[F_{TLi} \times BAF_{WLTLi}]\}$$

Where:

TSV	=	target species value in milligrams of substance per liter (mg/L).
TD	=	test dose that is toxic to the test species, either NOAEL or LOAEL.
UF_a	=	the uncertainty factor for extrapolating toxicity data across species (unitless). A species-specific UF_a must be selected and applied to each target species, consistent with the equation.
Uf_s	=	the uncertainty factor for extrapolating from subchronic to chronic exposures (unitless).
Uf_l	=	the uncertainty factor for extrapolation from LOAEL to NOAEL (unitless).
Wt	=	average weight in kilograms (kg) of the target species.
W	=	average daily volume of water in liters consumed per day (L/d) by the target species.
F_{TLi}	=	average daily amount of food consumed by the target species in kilograms (kg/d) for trophic level i.
BAF_{WLTLi}	=	aquatic life bioaccumulation factor with units of liter per kilogram (L/kg), as derived from 35 Ill. Adm. Code 302.570

for trophic level i.

e) Calculation of the Lake Michigan Basin Wildlife Criterion. TSVs are obtained for each target species. The geometric mean TSVs of all mammal species is calculated and also of all bird species. The LMWC is the lower of the bird or mammal geometric mean TSV.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.580 Procedures for Deriving Water Quality Criteria and Values in the Lake Michigan Basin to Protect Human Health - General

a) The Lake Michigan Basin human health criteria or values for a substance are those concentrations at which humans are protected from adverse effects resulting from incidental exposure to, or ingestion of, the waters of Lake Michigan and from ingestion of aquatic organisms taken from the waters of Lake Michigan. A Lake Michigan Human Health Threshold Criterion (LMHHTC) or Lake Michigan Human Health Threshold Value (LMHHTV) will be calculated for all substances according to 35 Ill. Adm. Code 302.585, if data is available. Water quality criteria or values for substances which are, or may be, carcinogenic to humans will also be calculated according to procedures for the Lake Michigan Human Health Nonthreshold Criterion (LMHHNC) or the Lake Michigan Human Health Nonthreshold Value (LMHHNV) in 35 Ill. Adm. Code 302.590.

b) Minimum data requirements for BAFs for Lake Michigan Basin human health criteria:

1) Tier I.

A) For all organic chemicals, either a field-measured BAF or a BAF derived using the BSAF methodology is required unless the chemical has a BAF less than 125, then a BAF derived by any methodology is required; and

B) For all inorganic chemicals, including organometals such as mercury, either a field-measured BAF or a laboratory-measured BCF is required.

2) Tier II. Any bioaccumulation factor method in 35 Ill. Adm. Code 302.570(a) may be used to derive a Tier II criterion.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.585 Procedures for Determining the Lake Michigan Basin Human Health

Threshold Criterion (LMHHTC) and the Lake Michigan Basin Human Health Threshold Value (LMHHTV)

The LMHHTC or LMHHTV is derived for all toxic substances from the most sensitive end point for which there exists a dosage or concentration below which no adverse effect or response is likely to occur.

a) Minimum data requirements:

1) Tier I. The minimum data set sufficient to derive a Tier I LMHHTC must include at least one epidemiological study or one animal study of greater than 90 days duration; or

2) Tier II. When the minimum data for deriving Tier I criteria are not available, a more limited database consisting of an animal study of greater than 28 days duration must be used.

b) Principles for development of Tier I criteria and Tier II values:

1) The experimental exposure level representing the highest level tested at which no adverse effects were demonstrated (NOAEL) must be used for calculation of a criterion or value. In the absence of a NOAEL, a LOAEL must be used if it is based on relatively mild and reversible effects;

2) Uncertainty factors (UFs) must be used to account for the uncertainties in predicting acceptable dose levels for the general human population based upon experimental animal data or limited human data:

A) A UF of 10 must be used when extrapolating from experimental results of studies on prolonged exposure to average healthy humans;

B) A UF of 100 must be used when extrapolating from results of long-term studies on experimental animals;

C) A UF of up to 1000 must be used when extrapolating from animal studies for which the exposure duration is less than chronic, but greater than subchronic;

D) A UF of up to 3000 must be used when extrapolating from animal studies for which the exposure duration is less than subchronic;

E) An additional UF of between one and ten must be used when deriving a criterion from a LOAEL. The level of additional

uncertainty applied will depend upon the severity and the incidence of the observed adverse effect;

F) An additional UF of between one and ten must be applied when there are limited effects data or incomplete sub-acute or chronic toxicity data;

3) The total uncertainty (∑ of the uncertainty factors) must not exceed 10,000 for Tier I criterion and 30,000 for Tier II value; and

4) All study results must be converted to the standard unit for acceptable daily exposure of milligrams of toxicant per kilogram of body weight per day (mg/kg/day). Doses must be adjusted for continuous exposure.

c) Tier I criteria and Tier II value derivation.

1) Determining the Acceptable Daily Exposure (ADE)

ADE = test value / ∑ of the UFs from subsection (b)(2)

Where:

acceptable daily exposure is in milligrams toxicant per kilogram body weight per day (mg/kg/day)

2) Determining the Lake Michigan Basin Human Health Threshold Criterion (LMHHTC) or the Lake Michigan Basin Human Health Threshold Value (LMHHTV)

LMHHTC or LMHHTV =

$$\{ADE \times BW \times RSC\} /$$

$$\{WC + [(FC_{TL3} \times BAF_{HHTL3}) + (FC_{TL4} \times BAF_{HHTL4})]\}$$

Where:

LMHHTC or LMHHTV is in milligrams per liter (mg/L)

ADE = acceptable daily intake in milligrams toxicant per kilogram body weight per day (mg/kg/day)

RSC = relative source contribution factor of 0.8

BW = weight of an average human (BW = 70 kg)

WC = per capita water consumption (both drinking and incidental exposure) for surface waters classified as public water supplies = two liters/day; or per capita incidental daily water ingestion for surface waters not used as human drinking water sources = 0.01 liters/day

FC_{TL3} = mean consumption of trophic level 3 fish by regional sport fishers of regionally caught freshwater fish = 0.0036 kg/day

FC_{TL4} = mean consumption of trophic level 4 fish by regional sport fishers of regionally caught freshwater fish = 0.0114 kg/day

BAF_{HHTL3} = human health bioaccumulation factor for edible portion of trophic level 3 fish, as derived using the BAF methodology in 35 Ill. Adm. Code 302.570

BAF_{HHTL4} = human health bioaccumulation factor for edible portion of trophic level 4 fish, as derived using the BAF methodology in 35 Ill. Adm. Code 302.570

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.590 Procedures for Determining the Lake Michigan Basin Human Health Nonthreshold Criterion (LMHHNC) or the Lake Michigan Basin Human Health Nonthreshold Value (LMHHNV)

A LMHHNC or LMHHNV must be derived for those toxic substances for which any exposure, regardless of extent, carries some risk of damage from cancer or a nonthreshold toxic mechanism. For single or combinations of substances, a risk level of 1 in 100,000 (or 10^{-5}) must be used for the purpose of determination of a LMHHNC or LMHHNV.

a) Minimum data requirements. Minimal experimental or epidemiological data requirements are incorporated in the cancer classification determined by USEPA at Appendix C II A to 40 CFR 132, incorporated by reference at 35 Ill. Adm. Code 301.106.

b) Principles for development of criteria or values:

1) Animal data are fitted to a linearized multistage computer model (Global 1986 in "Mutagenicity and Carcinogenicity Assessment for 1, 3-Butadiene" September 1985 EPA/600/8-85/004A, incorporated by reference at 35 Ill. Adm. Code 301.106 or scientifically justified equivalents). The upper-bound 95 percent confidence limit on risk at the 1 in 100,000 risk level must be used to calculate a risk associated dose

(RAD); and

2) A species scaling factor must be used to account for differences between test species and humans. Milligrams per surface area per day is an equivalent dose between species. All doses presented in mg/kg bodyweight will be converted to an equivalent surface area dose by raising the mg/kg dose to the 3/4 power.

c) Determining the risk associated dose (RAD). The RAD must be calculated using the following equation:

$$RAD = 0.00001 / q_1^*$$

Where:

RAD	=	risk associated dose in milligrams of toxicant or combinations of toxicants per kilogram body weight per day (mg/kg/day)
0.00001 (1 X 10^{-5})	=	incremental risk of developing cancer equal to 1 in 100,000
q_1^*	=	slope factor $(mg/kg/day)^{-1}$
RAD	=	risk associated dose in milligrams of toxicant or combinations of toxicants per kilogram body weight per day (mg/kg/day)
0.00001 (1 X 10(-5))	=	incremental risk of developing cancer equal to 1 in 100,000
q_1^*	=	slope factor $(mg/kg/day)^{-1}$

d) Determining the Lake Michigan Basin Human Health Nonthreshold Criterion (LMHHNC) or the Lake Michigan Basin Human Health Nonthreshold Value (LMHHNV):

LMHHNC or LMHHNV =

$$\{ RAD \times BW \} / \{ WC + [(FC_{TL3} \times BAF_{HHTL3}) + (FC_{TL4} \times BAF_{HHTL4})] \}$$

Where:

LMHHNC or LMHHNV is in milligrams per liter (mg/L)

RAD = risk associated dose of a substance or combination of substances in milligrams per day (mg/d) which is associated with a lifetime cancer risk level equal to a ratio of 1 to 100,000

BW = weight of an average human (BW = 70 kg)

WC = per capita water consumption for surface waters classified as public water supplies = two liters/day, or per capita incidental daily water ingestion for surface waters not used as human drinking water sources = 0.01 liters/day

FC_{TL3} = mean consumption of trophic level 3 of regionally caught freshwater fish = 0.0036 kg/day

FC_{TL4} = mean consumption of trophic level 4 of regionally caught freshwater fish = 0.0114 kg/day

BAF_{HHTL3}, BAF_{HHTL4} = bioaccumulation factor for trophic levels 3 and 4 as derived in 35 Ill. Adm. Code 302.570

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.595 Listing of Bioaccumulative Chemicals of Concern, Derived Criteria and Values

a) The Agency must maintain a listing of toxicity criteria and values derived under this Subpart. This list must be made available to the public and updated whenever a new criterion or value is derived and must be published when updated in the Illinois Register.

b) A criterion or value published under subsection (a) may be proposed to the Board for adoption as a numeric water quality standard.

c) The Agency must maintain for inspection all information including, assumptions, toxicity data and calculations used in the derivation of any toxicity criterion or value listed pursuant to subsection (a) until adopted by the Board as a numeric water quality standard.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

SUBPART F: PROCEDURES FOR DETERMINING WATER QUALITY CRITERIA

Section 302.601 Scope and Applicability

This Subpart contains the procedures for determining the water quality criteria in 35 Ill. Adm.

Code 302.210(a), (b) and (c) and 302.410(a), (b) and (c).

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.603 Definitions

As used in this Subpart, the following terms have the meanings specified.

"Bioconcentration" means an increase in concentration of a chemical and its metabolites in an organism (or its specified tissues) relative to the concentration of the chemical in the ambient water acquired through contact with the water alone.

"Carcinogen" means a chemical which causes an increased incidence of benign or malignant neoplasms, or a statistically significant decrease in the latency period between exposure and onset of neoplasms in at least one mammalian species or man through epidemiological or clinical studies.

"EC-50" means the concentration of a substance or effluent which causes a given effect to 50% of the exposed organisms in a given time period.

"LC-50" means the concentration of a toxic substance or effluent which is lethal to 50% of the exposed organisms in a given time period.

"LOAEL" or "Lowest Observable Adverse Effect Level" means the lowest tested concentration of a chemical or substance which produces a statistically significant increase in frequency or severity of non-overt adverse effects between the exposed population and its appropriate control.

"MATC" or "Maximum Acceptable Toxicant Concentration" means the value obtained by calculating the geometric mean of the lower and upper chronic limits from a chronic test. A lower chronic limit is the highest tested concentration which did not cause the occurrence of a specified adverse effect. An upper chronic limit is the lowest tested concentration which did cause the occurrence of a specified adverse effect and above which all tested concentrations caused such an occurrence.

"NOAEL" or "No Observable Adverse Effect Level" means the highest tested concentration of a chemical or substance which does not produce a statistically significant increase in frequency or severity of non-overt adverse effects between the exposed population and its appropriate control.

"Resident or Indigenous Species" means species which currently live a substantial portion of their lifecycle or reproduce in a given body of water, or which are

native species whose historical range includes a given body of water.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.604 Mathematical Abbreviations

This Subpart uses the following mathematical abbreviations:

exp x	base of the natural logarithm, e, raised to x-power
ln x	natural logarithm of x
log x	logarithm to the base 10 of x
A**B	A raised to the B-power
SUM(x)	summation of the values of x

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.606 Data Requirements

The Agency must review, for validity, applicability and completeness, data used in calculating criteria. To the extent available, and to the extent not otherwise specified, testing procedures, selection of test species and other aspects of data acquisition must be according to methods published by USEPA or nationally recognized standards organizations, including methods found in "Standard Methods", incorporated by reference in 35 Ill. Adm. Code 301.106.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.612 Determining the Acute Aquatic Toxicity Criterion for an Individual Substance - General Procedures

a) A chemical specific Acute Aquatic Toxicity Criterion (AATC) is calculated using procedures specified in 35 Ill. Adm. Code 302.615 and 302.618 if acute toxicity data are available for at least five resident or indigenous species from five different North American genera of freshwater organisms including representatives of the following taxa:

1) Representatives of two families in the Class Osteichthyes (Bony Fishes).

2) The family Daphnidae.

3) A benthic aquatic macroinvertebrate.

4) A vascular aquatic plant or a third family in the Phylum Chordata which may be from the Class Osteichthyes.

b) If data are not available for resident or indigenous species, data for non-resident species may be used if the non-resident species is of the same family or genus and has a similar habitat and environmental tolerance. The procedures of 35 Ill. Adm. Code 302.615 must be used to obtain an AATC for individual substances whose toxicity is unaffected by ambient water quality characteristics. The procedures of 35 Ill. Adm. Code 302.618 must be used if the toxicity of a substance is dependent upon some other water quality characteristic.

c) If data are not available that meet the requirements of subsection (a), an AATC is calculated by obtaining at least one EC-50 or LC-50 value from both a daphnid species and either fathead minnow or bluegill. If there are data available for any other North American freshwater species, they must also be included. An AATC is calculated by dividing the lowest Species Mean Acute Value (SMAV), as determined according to 35 Ill. Adm. Code 302.615, by 10.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.615 Determining the Acute Aquatic Toxicity Criterion – Toxicity Independent of Water Chemistry

If the acute toxicity of the chemical has not been shown to be related to a water quality characteristic, including hardness, pH, temperature, etc., the AATC is calculated by using the procedures below.

a) For each species for which more than one acute value is available, the Species Mean Acute Value (SMAV) is calculated as the geometric mean of the acute values from all tests.

b) For each genus for which one or more SMAVs are available, the Genus Mean Acute Value (GMAV) is calculated as the geometric mean of the SMAVs available for the genus.

c) The GMAVs are ordered from high to low.

d) Ranks (R) are assigned to the GMAVs from "l" for the lowest to "N" for the highest. If two or more GMAVs are identical, successive ranks are arbitrarily assigned.

e) The cumulative probability, P, is calculated for each GMAV as R/(N + l).

f) The GMAVs to be used in the calculations of subsection (g) must be those with cumulative probabilities closest to 0.05. If there are less than 59 GMAVs in the total data set, the values utilized must be the lowest obtained through the ranking procedures of subsections (c) and (d). "T" is the number of GMAV's which are to

be used in the calculations of subsection (g). T is equal to 4 when the data set includes at least one representative from each of the five taxa in 35 Ill. Adm. Code 302.612 and a representative from each of the three taxa listed below. T is equal to 3 when the data includes at least one representative from each of the five taxa in 35 Ill. Adm. Code 302.612 and from one or two of the taxa listed below. T is equal to 2 when the data set meets the minimum requirements of 35 Ill. Adm. Code 302.612 but does not include representatives from any of the three taxa listed below. When toxicity data on any of the three taxa listed below are available, they must be used along with the minimum data required pursuant to 35 Ill. Adm. Code 302.612.

1) A benthic crustacean, unless one was used under 35 Ill. Adm. Code 302.612(a)(3), in which case an insect must be used.

2) A member of a phylum not used in subsections (a), (b) or (f)(1).

3) An insect from an order not already represented.

g) Using the GMAVs and T-value identified under subsection (f) and the Ps calculated under subsection (e), the Final Acute Value (FAV) and the AATC are calculated as:

FAV = exp(A) and
AATC = FAV/2

Where:

A = L + 0.2236 S;
L = [SUM(1n GMAV) - S(SUM(P**0.5))]/T; and
S = [[SUM((1n GMAV)**2) - ((SUM(1n GMAV))**2)/T]/[SUM(P) - ((SUM(P**0.5))**2)/T]]**0.5

h) If a resident or indigenous species, whose presence is necessary to sustain commercial or recreational activities, or prevent disruptions of the waterbody's ecosystem, including loss of species diversity or a shift to a biotic community dominated by pollution-tolerant species, will not be protected by the calculated FAV, then the EC-50 or LC-50 for that species is used as the FAV.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.618 Determining the Acute Aquatic Toxicity Criterion - Toxicity Dependent on Water Chemistry

If data are available to show that a relationship exists between a water quality characteristic (WQC) and acute toxicity to two or more species, an Acute Aquatic Toxicity Criterion (AATC) may be calculated. The best documented relationship is that between the water quality characteristic, hardness and acute toxicity of metals. Although this relationship between hardness and acute toxicity is typically non-linear, it can be linearized by a logarithmic transformation (i.e. for any variable, K, f(K) = logarithm of K) of the variables and plotting the logarithm of hardness against the logarithm of acute toxicity. Similarly, relationships between acute toxicity and other water quality characteristics, such as pH or temperature, may require a transformation, including no transformation (i.e. for any variable, K, f(K) = K) for one or both variables to obtain least squares linear regression of the transformed acute toxicity values on the transformed values of the water quality characteristic. An AATC is calculated using the following procedures:

a) For each species for which acute toxicity values are available at two or more different values of the water quality characteristic, a linear least squares regression of the transformed acute toxicity (TAT) values on the transformed water quality characteristic (TWQC) values is performed to obtain the slope of the line describing the relationship.

b) Each of the slopes determined pursuant to subsection (a) is evaluated as to whether or not it is statistically valid, taking into account the range and number of tested values of the water quality characteristic and the degree of agreement within and between species. If slopes are not available for at least one fish and one invertebrate species, or if the available slopes are too dissimilar, or if too few data are available to define the relationship between acute toxicity and the water quality characteristic, then the AATC must be calculated using the procedures in 35 Ill. Adm. Code 302.615.

c) Normalize the TAT values for each species by subtracting W, the arithmetic mean of the TAT values of a species from each of the TAT values used in the determination of the mean, such that the arithmetic mean of the normalized TAT values for each species individually or for any combination of species is zero (0.0).

d) Normalize the TWQC values for each species using X, the arithmetic mean of the TWQC values of a species, in the same manner as in subsection (c).

e) Group all the normalized data by treating them as if they were from a single species and perform at least squares linear regression of all the normalized TAT values on the corresponding normalized TWQC values to obtain the pooled acute slope, V.

f) For each species, the graphical intercept representing the species TAT intercept, f(Y), at a specific selected value, Z, of the WQC is calculated using the equation:

f(Y) = W - V(X - g(Z))

Where:

f() is the transformation used to convert acute toxicity values to TAT values;

Y is the species acute toxicity intercept or species acute intercept;

W is the arithmetic mean of the TAT values as specified in subsection (c);

V is the pooled acute slope as specified in subsection (e);

X is the arithmetic mean of the TWQC values as specified in subsection (d);

g() is the transformation used to convert the WQC values to TWQC values; and

Z is a selected value of the WQC.

g) For each species, determine the species acute intercept, Y, by carrying out an inverse transformation of the species TAT value, f(Y). For example, in the case of a logarithmic transformation, Y = antilogarithm of (f(Y)); or in the case where no transformation is used, Y = f(Y).

h) The Final Acute Intercept (FAI) is derived by using the species acute intercepts, obtained from subsection (g), in compliance with the procedures described in 35 Ill. Adm. Code 302.615(b) through (g), with the word "value" replaced by the word "intercept". Note that in this procedure geometric means and natural logarithms are always used.

i) The Aquatic Acute Intercept (AAI) is obtained by dividing the FAI by two.

j) The AATC at any value of the WQC, denoted by WQCx, is calculated using the terms defined in subsection (f) and the equation:

AATC = exp[V (g(WQCx) - g(Z)) + f (AAI)].

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.621 Determining the Acute Aquatic Toxicity Criterion - Procedure for Combinations of Substances

An AATC for any combination of substances (including effluent mixtures) must be determined by the following toxicity testing procedures:

a) Not more than 50% of test organisms from the most sensitive species tested may exhibit mortality or immobility after a 48-hour test for invertebrate or a 96-hour test for fishes.

b) Three resident or indigenous species of ecologically diverse taxa must be tested initially. If resident or indigenous species are not available for testing, non-resident species may be used if the non-resident species is of the same family or genus and has a similar habitat and environmental tolerance.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.627 Determining the Chronic Aquatic Toxicity Criterion for an Individual Substance - General Procedures

a) A chemical-specific Chronic Aquatic Toxicity Criterion (CATC) is calculated using procedures specified in subsection (b) when chronic toxicity data are available for at least five species from five different North American genera of freshwater organisms, including representatives from the following taxa:

1) Representatives of two families in the Class Osteichthyes (Bony Fishes).

2) The family Daphnidae.

3) A benthic aquatic macroinvertebrate.

4) An alga (96-hour test) or a vascular aquatic plant.

b) A CATC is derived in the same manner as the FAV in 35 Ill. Adm. Code 302.615 or 302.618 by substituting CATC for FAV or FAI, chronic for acute, MATC for LC-50, SMCV (Species Mean Chronic Value) for SMAV, and GMCV (Genus Mean Chronic Value) for GMAV.

c) If data are not available to meet the requirements of subsection (a), a CATC is calculated by dividing the FAV by the highest acute-chronic ratio obtained from at least one fish and one invertebrate species. The acute-chronic ratio for a species equals the acute toxicity concentration from data considered under 35 Ill. Adm. Code 302.612 through 302.618, divided by the chronic toxicity concentration from data calculated under subsections (a) and (b) subject to the following conditions:

1) If the toxicity of a substance is related to any water quality characteristic (WQC), the acute-chronic ratio must be based on acute and chronic toxicity data obtained from organisms exposed to test water with WQC values that are representative of the WQC values of the waterbody under consideration. Preference under this subsection must be given to data from acute and chronic tests done by the same author or in the same reference in order to increase the likelihood of comparable test conditions.

2) If the toxicity of a substance is unrelated to water quality parameters, the acute-chronic ratio may be derived from any acute and chronic test on a species regardless of the similarity in values of those water quality parameters. Preference under this subsection must be given to data from acute and chronic tests done on the same organisms or their descendants.

3) If there is more than one acute-chronic ratio for a species, a geometric mean of the ratio is calculated, corrected for the relationship of toxicity to water quality parameters.

4) If the acute and chronic toxicity data indicate that the acute-chronic ratio varies with changes in water quality parameters, the acute-chronic ratio used over specified values of the water quality parameters must be based on the ratios at water quality parameter values closest to those specified.

5) If acute and chronic toxicity data are unavailable to determine an acute-chronic ratio for at least two North American freshwater species, a ratio of 25 must be used.

d) If a resident or indigenous species whose presence is necessary to sustain commercial or recreational activities, or prevent disruptions of the waterbody's ecosystem, including but not limited to loss of species diversity or a shift to a biotic community dominated by pollution-tolerant species, will not be protected by the calculated CATC, then the MATC for that species is used as the CATC.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.630 Determining the Chronic Aquatic Toxicity Criterion - Procedure for Combinations of Substances

A CATC for any combination of substances (including effluent mixtures) may be determined by toxicity testing procedures pursuant to the following:

a) A combination of substances must not exceed concentrations greater than a NOAEL as determined for the most sensitive of the species tested.

b) Three resident or indigenous species of ecologically diverse taxa must be tested initially. If resident or indigenous species are not available for testing, non-resident species may be used if the non-resident species is of the same family or genus and has a similar habitat and environmental tolerance.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.633 The Wild and Domestic Animal Protection Criterion

The Wild and Domestic Animal Protection Criterion (WDAPC) is the concentration of a substance which if not exceeded protects Illinois wild and domestic animals from adverse effects, such as functional impairment or pathological lesions, resulting from ingestion of surface waters of the State and from ingestion of aquatic organisms taken from surface waters of the State.

a) For those substances for which a NOAEL has been derived from studies of mammalian or avian species exposed to the substance via oral routes including gavage, the lowest NOAEL among species must be used in calculating the WDAPC. Additional considerations in selecting NOAEL include:

1) If the NOAEL is given in milligrams of toxicant per liter of water consumed (mg/L), prior to calculating the WDAPC, the NOAEL must be multiplied by the daily average volume of water consumed by the test animals in liters per day (L/d) and divided by the average weight of the test animals in kilograms (kg).

2) If the NOAEL is given in milligrams of toxicant per kilogram of food consumed (mg/kg), prior to calculating the WDAPC, the NOAEL must be multiplied by the average amount of food in kilograms consumed daily by the test animals (kg/d) and divided by the average weight of the test animals in kilograms (kg).

3) If the animals used in a study were not exposed to the toxicant each day of the test period, the NOAEL must be multiplied by the ratio of days of exposure to the total days in the test period.

4) If more than one NOAEL is available for the same animal species, the geometric mean of the NOAELs must be used to calculate the WDAPC.

b) For those substances for which a NOAEL is not available but the lowest observed adverse effect level (LOAEL) has been derived from studies of animal species exposed to the substance via oral routes including gavage, one-tenth of the LOAEL must be substituted for the NOAEL.

c) The LOAEL must be selected in the same manner as that specified for the NOAEL in subsection (a).

d) The WDAPC, measured in milligrams per liter (mg/L), is calculated according to the equation:

WDAPC = [0.1 NOAEL x Wt]/[W + (F x BCF)]

Where:

NOAEL is derived from mammalian or avian studies as specified in subsections (a) and (b), and is measured in units of milligrams of substance per kilogram of body weight per day (mg/kg-d);

Wt = Average weight in kilograms (kg) of the test animals;

W = Average daily volume of water in liters consumed per day (l/d) by the test animals;

F = Average daily amount of food consumed by the test animals in kilograms (kg/d);

BCF = Aquatic life Bioconcentration Factor with units of liter per kilogram (L/kg), as derived in 35 Ill. Adm. Code 302.660 through 302.666; and

The 0.1 represents an uncertainty factor to account for species variability.

e) If no studies pertaining to the toxic substance in question can be found by the Agency, no criterion can be determined.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.645 Determining the Acceptable Daily Intake

The Acceptable Daily Intake (ADI) is the maximum amount of a substance which, if ingested daily for a lifetime, results in no adverse effects to humans. Subsections (a) through (e) list, in the order of preference, methods for determining the acceptable daily intake.

a) The lowest of the following ADI values:

1) For substances listed with a maximum contaminant level in 40 CFR 141, incorporated by reference in 35 Ill. Adm. Code 301.106, or in 35 Ill. Adm. Code 611, the ADI equals the product of multiplying the maximum contaminant level given in milligrams per liter (mg/L) by 2 liters per day (L/d).

2) For substances which are listed with a maximum allowable concentration

standard in 35 Ill. Adm. Code Subtitle F, the acceptable daily intake equals the product of multiplying the public health enforcement standard given in milligrams per liter (mg/L) by 2 liters per day (L/d).

b) For substances for which a no observed adverse effect level (NOAEL-H) for humans exposed to the substance in drinking water has been derived, the acceptable daily intake equals the product of multiplying one-tenth of the NOAEL-H given in milligrams of toxicant per liter of water consumed (mg/L), by 2 liters per day (L/d). The lowest NOAEL-H must be used in the calculation of the acceptable daily intake.

c) For substances for which the lowest observed adverse effect level (LOAEL-H) for humans exposed to the substance in drinking water has been derived, one-hundredth of the LOAEL-H may be substituted for the NOAEL-H in subsection (b).

d) For substances for which a no observed adverse effect level (NOAEL-A) has been derived from studies of mammalian test species exposed to the substance via oral routes including gavage, the acceptable daily intake equals the product of multiplying 1/100 of the NOAEL-A given in milligrams toxicant per day per kilogram of test species weight (mg/kg-d) by the average weight of an adult human of 70 kilograms (kg). The lowest NOAEL-A among animal species must be used in the calculation of the acceptable daily intake. Additional considerations in selecting the NOAEL-A include:

1) If the NOAEL-A is given in milligrams of toxicant per liter of water consumed (mg/L) then, prior to calculating the acceptable daily intake, the NOAEL-A must be multiplied by the daily average volume of water consumed by the mammalian test species in liters per day (L/d) and divided by the average weight of the mammalian test species in kilograms (kg).

2) If the NOAEL-A is given in milligrams of toxicant per kilogram of food consumed (mg/kg), prior to calculating the acceptable daily intake the NOAEL-A must be multiplied by the average amount in kilograms of food consumed daily by the mammalian test species (kg/d) and divided by the average weight of the mammalian test species in kilograms (kg).

3) If the mammalian test species were not exposed to the toxicant each day of the test period, the NOAEL-A must be multiplied by the ratio of days of exposure to the total days of the test period.

4) If more than one NOAEL-A is available for the same mammalian test species, the geometric mean of the NOAEL-As must be used.

e) For substances for which a NOAEL-A is not available but the lowest observed adverse effect level (LOAEL-A) has been derived from studies of mammalian test species exposed to the substance via oral routes including gavage, one-tenth of the LOAEL-A may be substituted for the NOAEL-A in subsection (d). The LOAEL-A must be selected in the same manner as that specified for the NOAEL-A in subsection (d).

f) If no studies pertaining to the toxic substance in question can be found by the Agency, no criterion can be determined.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.648 Determining the Human Threshold Criterion

The HTC is calculated according to the equation:

HTC = ADI/[W + (F x BCF)]

where:

HTC = Human health protection criterion in milligrams per liter (mg/L);

ADI = Acceptable daily intake of substance in milligrams per day (mg/d) as specified in 35 Ill. Adm. Code 302.645;

W = Per capita daily water consumption equal to 2 liters per day (L/d) for surface waters at the point of intake of a public or food processing water supply, or equal to 0.01 liters per day (L/d) which represents incidental exposure through contact or ingestion of small volumes of water while swimming or during other recreational activities for areas which are determined to be public access areas under 35 Ill. Adm. Code Section 302.102 (b)(3), or 0.001 liters per day (L/d) for other waters;

F = Assumed daily fish consumption in the United States equal to 0.020 kilograms per day (kg/d); and

BCF = Aquatic organism Bioconcentration Factor with units of liter per kilogram (L/kg) as derived in 35 Ill. Adm. Code 302.660 through 302.666.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.651 The Human Nonthreshold Criterion

The Human Nonthreshold Criterion (HNC) of a substance is that concentration or level of a substance at which humans are protected from an unreasonable risk of disease caused by a nonthreshold toxic mechanism as a result of incidental exposure to or ingestion of surface waters of the State and from ingestion of aquatic organisms taken from surface waters of the State. HNCs are derived for those toxic substances for which any exposure, regardless of extent, carries some risk of damage as specified in subsections (a) and (b).

a) For single substances, a risk level of one in one million (1 in 1,000,000) must be allowed (i.e, considered acceptable) for the purposes of determining an HNC.

b) For mixtures of substances, an additive risk level of one in one hundred thousand (1 in 100,000) must be allowed (i.e, considered acceptable) for the purposes of determining an HNC.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.654 Determining the Risk Associated Intake

The Risk Associated Intake (RAI) is the maximum amount of a substance which if ingested daily for a lifetime is expected to result in the risk of one additional case of human cancer in a population of one million. Where more than one carcinogenic chemical is present, the RAI must be based on an allowed additive risk of one additional case of cancer in a population of one hundred thousand. The RAI must be derived as specified in subsections (a) through (c).

a) For those substances for which a human epidemiologic study has been performed, the RAI equals the product of the dose from exposure in units of milligrams toxicant per kilogram body weight per day (mg/kg-d) that results in a 70-year lifetime cancer probability of one in one million, times the average weight of an adult human of 70 kilograms (kg). The resulting RAI is expressed in milligrams toxicant per day (mg/d). If more than one human epidemiologic study is available, the lowest exposure level resulting in a 70-year lifetime probability of cancer equal to a ratio of one in one hundred thousand must be used in calculating the RAI.

b) In the absence of an epidemiologic study, for those toxic substances for which a carcinogenic potency factor (CPF) has been derived from studies of mammalian test species the risk associated intake is calculated from the equation:

$$RAI = K/CPF$$

Where:

RAI = Risk associated intake in milligrams per day (mg/d);

K = A constant consisting of the product of the average weight of an adult human, assumed to be 70 kg, and the allowed cancer risk level of one in one million (1/1,000,000); and

CPF = Carcinogenic Potency Factor is the risk of one additional cancer per unit dose from exposure. The CPF is expressed in units of inverse milligrams per kilogram - day (l/mg/kg-d) as derived in subsections (b)(1) through (b)(7).

1) Only those studies which fulfill the data requirement criteria of 35 Ill. Adm. Code 302.606 must be used in calculating the CPF.

2) The linear non-threshold dose-response relationship developed in the same manner as in the USEPA document "Mutagenicity and Carcinogenicity Assessment of 1,3-butadiene", incorporated by reference in 35 Ill. Adm. Code 301.106, must be used in obtaining the unit risk, defined as the 95th percentile upper bound risk of one additional cancer resulting from a life time exposure to a unit concentration of the substance being considered. The CPF must be estimated from the unit risk in compliance with subsection (b)(7). In calculating a CPF, the Agency must review alternate scientifically valid protocols if so requested.

3) If in a study of a single species more than one type of tumor is induced by exposure to the toxic substance, the highest of the CPFs is used.

4) If two or more studies vary in either species, strain or sex of the test animal, or in tumor type, the highest CPF is used.

5) If more than one tumor of the same type is found in some of the test animals, these should be pooled so that the dose response relationship is dose versus number of tumors per animal. The potency estimate for this dose response relationship is used if it is higher than estimates resulting from other methods.

6) If two or more studies are identical regarding species, strain and sex of the test animal, and tumor type, the highest of the CPFs is used.

7) Calculation of an equivalent dose between animal species and humans using a surface area conversion, and conversion of units of exposure to dose in milligrams of toxicant per kilogram of body weight per day (mg/kg-d) must be performed as specified in the USEPA document "Mutagenicity and Carcinogenicity Assessment of 1,3-butadiene", incorporated by reference in 35 Ill. Adm. Code 301.106.

c) If both a human epidemiologic study and a study of mammalian test species are available for use in subsections (a) and (b), the risk associated intake is determined as follows:

1) When the human epidemiologic study provides evidence of a carcinogenic effect on humans, the RAI is calculated from the human epidemiology study as specified in subsection (a).

2) When the mammalian study provides evidence a carcinogenic effect on humans, but the human epidemiologic study does not, a cancer risk to humans is assumed and the risk associated intake is calculated as specified in subsection (b).

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.657 Determining the Human Nonthreshold Criterion

The HNC is calculated according to the equation:

$$HNC = RAI/[W + (F \times BCF)]$$

where:

HNC = Human Nonthreshold Protection Criterion in milligrams per liter (mg/L);

RAI = Risk Associated Intake of a substance in milligrams per day (mg/d) which is associated with a lifetime cancer risk level equal to a ratio of one to 1,000,000 as derived in 35 Ill. Adm. Code 302.654;

W = Per capita daily water consumption equal to 2 liters per day (L/d) for surface waters at the point of intake of a public or food processing water supply, or equal to 0.01 liters per day (L/d) which represents incidental exposure through contact or ingestion of small volumes of water while swimming or during other recreational activities for areas which are determined to be public access areas under 35 Ill. Adm. Code 302.102(b)(3), or 0.001 liters per day (L/d) for other waters;

F = Assumed daily fish consumption in the United States equal to 0.020 kilograms per day (kg/d); and

BCF = Aquatic Life Bioconcentration Factor with units of liter per kilogram (L/kg) as derived in 35 Ill. Adm. Code 302.663.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.658 Stream Flow for Application of Human Nonthreshold Criterion

The HNC applies at all times except during periods when flows are less than the harmonic mean flow (Qhm), as determined by:

Qhm = N / SUM(1/Qi)

Where:

Qhm = harmonic mean flow,
N = number of daily values for stream flows, and
Qi = daily streamflow value on day i.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.663 Determination of Bioconcentration Factors

A Bioconcentration Factor equals the concentration of a substance in all or part of an aquatic organism in milligrams per kilogram of wet tissue weight (mg/kg), divided by the concentration of the substance in the water to which the organism is exposed in milligrams of the substance per liter of water (mg/L).

a) The Bioconcentration Factor is calculated from a field study if the following conditions are met:

1) Data are available to show that the concentration of the substance in the water to which the organism was exposed remained constant over the range of territory inhabited by the organism and for a period of time exceeding 28 days;

2) Competing mechanisms for removal of the substance from solution did not affect the bioavailability of the substance; and

3) The concentration of the substance to which the organism was exposed is less than the lowest concentration causing any adverse effects on the organism.

b) In the absence of a field-derived Bioconcentration Factor, the Bioconcentration Factor is calculated from a laboratory test if the following conditions are met:

1) The Bioconcentration Factor was calculated from measured concentrations of the toxic substance in the test solution;

2) The laboratory test was of sufficient duration to have reached steady-state which is defined as a less than 10 percent change in the calculated Bioconcentration Factor over a 2-day period or 16 percent of the test duration whichever is longer. In the absence of a laboratory test which has reached steady-state, the Bioconcentration Factor may be calculated from a laboratory test with a duration greater than 28 days if more than one test is available for the same species of organism;

3) The concentration of the toxic substance to which the test organism was exposed is less than the lowest concentration causing any adverse effects on the organism;

4) If more than one Bioconcentration Factor for the same species is available, the geometric mean of the Bioconcentration Factors is used; and

5) The Bioconcentration Factor is calculated on a wet tissue weight basis. A Bioconcentration Factor calculated using dry tissue weight must be converted to a wet tissue weight basis by multiplying the dry weight bioconcentration value by 0.1 for plankton and by 0.2 for individual species of fishes and invertebrates.

c) In the absence of any Bioconcentration Factors measured from field studies as specified in subsection (a) or laboratory studies which have reached steady-state as specified in subsection (b), the Bioconcentration Factor is calculated according to the equation:

log BCF = A + B log Kow

Where:

BCF = Bioconcentration Factor;

Kow = The octanol/water partition coefficient measured as specified in ASTM E 1147, incorporated by reference in 35 Ill. Adm. Code 301.106 (If the Kow is not available from laboratory testing, it must be calculated from structure-activity relationships or available regression equations.); and

The constants A = -0.23 and B = 0.76 must be used unless a change in the value of the constants is requested (The Agency must honor requests for changes only if such changes are accompanied by scientifically valid supporting data.).

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.666 Utilizing the Bioconcentration Factor

The Bioconcentration Factor derived in 35 Ill. Adm. Code 302.663 is used to calculate water quality criteria for a substance as specified below:

a) When calculating a WDAPC as described in 35 Ill. Adm. Code 302.633, the geometric mean of all available steady-state whole body Bioconcentration Factors for fish and shellfish species which constitutes or represents a portion of the diet of indigenous wild and domestic animal species is used. Additional considerations in deriving a Bioconcentration Factor include:

1) An edible portion Bioconcentration Factor is converted to a whole body Bioconcentration Factor for a fish or shellfish species by multiplying the edible portion Bioconcentration Factor by the ratio of the percent lipid in the whole body to the percent lipid in the edible portion of the same species.

2) A Bioconcentration Factor calculated as described in 35 Ill. Adm. Code 302.663(c) is converted to a whole body Bioconcentration Factor by multiplying the calculated Bioconcentration Factor by the ratio of the percent lipid in the whole body to 7.6.

b) When calculating either a human threshold criterion or a human nonthreshold criterion as described in 35 Ill. Adm. Code 302.642 through 302.648 and 35 Ill. Adm. Code 302.651 through 302.657, respectively, the geometric mean of all available edible portion Bioconcentration Factors for fish and shellfish species consumed by humans is used. Additional considerations in deriving a Bioconcentration Factor include:

1) Edible portions include:

A) Decapods – muscle tissue.

B) Bivalve molluscs – total living tissue.

C) Scaled fishes – boneless, scaleless filets including skin except for bloater chubs in which the edible portion is the whole body excluding head, scales and viscera.

D) Smooth-skinned fishes – boneless, skinless filets.

2) A whole body Bioconcentration Factor is converted to an edible portion

Bioconcentration Factor by multiplying the whole body Bioconcentration Factor of a species by the ratio of the percent lipid in the edible portion to the percent lipid in the whole body of the same species.

3) A Bioconcentration Factor calculated as described in 35 Ill. Adm. Code 302.663 is converted to an edible portion Bioconcentration Factor by multiplying the calculated Bioconcentration Factor by the ratio of the percent lipid in the edible portion to 7.6.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.669 Listing of Derived Criteria

a) The Agency must develop and maintain a listing of toxicity criteria pursuant to this Subpart. This list must be made available to the public and updated whenever a new criterion is derived and must be published when updated in the Illinois Register.

b) A criterion published pursuant to subsection (a) may be proposed to the Board for adoption as a numeric water quality standard.

c) The Agency must maintain for inspection all information including assumptions, toxicity data and calculations used to derive any toxicity criterion listed pursuant to subsection (a) until adopted by the Board as a water quality standard.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.APPENDIX A References to Previous Rules (Repealed)

(Source: Repealed at 46 Ill. Reg. _____, effective _____)

Section 302.APPENDIX B Sources of Codified Sections (Repealed)

(Source: Repealed at 46 Ill. Reg. _____, effective _____)

~~POLLUTION CONTROL BOARD~~

~~NOTICE OF PROPOSED AMENDMENTS~~

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE C: WATER POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD

PART 302
WATER QUALITY STANDARDS

SUBPART A: GENERAL WATER QUALITY PROVISIONS

SUBPART B: GENERAL USE WATER QUALITY STANDARDS

SUBPART C: PUBLIC AND FOOD PROCESSING WATER SUPPLY STANDARDS

~~POLLUTION CONTROL BOARD~~

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~~POLLUTION CONTROL BOARD~~

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302.TABLE C Temperature and pH-Dependent Values of the CS (Chronic Standard) for Fish Early Life Stages Present
302.APPENDIX D Section 302.206(d): Stream Segments for Enhanced Dissolved Oxygen Protection

AUTHORITY: Implementing Section 13 and authorized by Sections 11(b) and 27 of the Environmental Protection Act [415 ILCS 5/13, 11(b), and 27].

SOURCE: Filed with the Secretary of State January 1, 1978; amended at 2 Ill. Reg. 44, p. 151, effective November 2, 1978; amended at 3 Ill. Reg. 20, p. 95, effective May 17, 1979; amended at 3 Ill. Reg. 25, p. 190, effective June 21, 1979; codified at 6 Ill. Reg. 7818; amended at 6 Ill. Reg. 11161, effective September 7, 1982; amended at 6 Ill. Reg. 13750, effective October 26, 1982; amended at 8 Ill. Reg. 1629, effective January 18, 1984; peremptory amendments at 10 Ill. Reg. 461, effective December 23, 1985; amended at R87-27 at 12 Ill. Reg. 9911, effective May 27, 1988; amended at R85-29 at 12 Ill. Reg. 12082, effective July 11, 1988; amended in R88-1 at 13 Ill. Reg. 5998, effective April 18, 1989; amended in R88-21(A) at 14 Ill. Reg. 2899, effective February 13, 1990; amended in R88-21(B) at 14 Ill. Reg. 11974, effective July 9, 1990; amended in R94-1(A) at 20 Ill. Reg. 7682, effective May 24, 1996; amended in R94-1(B) at 21 Ill. Reg. 370, effective December 23, 1996; expedited correction at 21 Ill. Reg. 6273, effective December 23, 1996; amended in R97-25 at 22 Ill. Reg. 1356, effective December 24, 1997; amended in R99-8 at 23 Ill. Reg. 11249, effective August 26, 1999; amended in R01-13 at 26 Ill. Reg. 3505, effective February 22, 2002; amended in R02-19 at 26 Ill. Reg. 16931, effective November 8, 2002; amended in R02-11 at 27 Ill. Reg. 166, effective December 20, 2002; amended in R04-21 at 30 Ill. Reg. 4919, effective March 1, 2006; amended in R04-25 at 32 Ill. Reg. 2254, effective January 28, 2008; amended in R07-9 at 32 Ill. Reg. 14978, effective September 8, 2008; amended in R11-18 at 36 Ill. Reg. 18871, effective December 12, 2012~~.~~; amended in R11-18(B) at 37 Ill. Reg. 7493, effective May 16, 2013~~,~~; amended ~~at~~ in R08-09(D) at 39 Ill. Reg. 9388, effective July 1, 2015; amended in R18-23 at 46 Ill. Reg. _____, effective _____.

SUBPART A: GENERAL WATER QUALITY PROVISIONS

Section 302.100 Definitions

Unless otherwise specified, the definitions of the Environmental Protection Act (Act) [415 ILCS 5] and 35 Ill. Adm. Code 301 apply to this Part. As used in this Part, each of the following definitions has the specified meaning.

"Acute Toxicity" means the capacity of any substance or combination of

substances to cause mortality or other adverse effects in an organism resulting from a single or short-term exposure to the substance.

"Adverse Effect" means any gross or overt effect on an organism, including but not limited to reversible histopathological damage, severe convulsions, irreversible functional impairment and lethality, as well as any non-overt effect on an organism resulting in functional impairment or pathological lesions which may affect the performance of the whole organism, or which reduces an organism's ability to respond to an additional challenge.

"Chronic Toxicity" means the capacity of any substance or combination of substances to cause injurious or debilitating effects in an organism which result from exposure for a time period representing a substantial portion of the natural life cycle of that organism, including but not limited to the growth phase, the reproductive phases or such critical portions of the natural life cycle of that organism.

"Criterion" means the numerical concentration of one or more toxic substances derived in ~~complianceaccordance~~compliance with the procedures in Subpart F ~~of this Part~~ which, if not exceeded, would assure compliance with the narrative toxicity standard of 35 Ill. Adm. ~~Code~~~~Section~~Code 302.210 ~~of this Part~~.

"Early Life Stages" of fish means the pre-hatch embryonic period, the post-hatch free embryo or yolk-sac fry, and the larval period, during which the organism feeds. Juvenile fish, which are anatomically similar to adults, are not considered an early life stage.

"Hardness" means a water quality parameter or characteristic consisting of the sum of calcium and magnesium concentrations expressed in terms of equivalent milligrams per liter as calcium carbonate. Hardness is measured in ~~complianceaccordance~~compliance with methods specified in 40 CFR 136, incorporated by reference in 35 Ill. Adm. Code 301.106.

"Mixing Zone" means a portion of the waters of the State identified as a region within which mixing is allowed under 35 Ill. Adm. ~~Code~~pursuant to ~~Section~~Code 302.102(d) ~~of this Part~~.

"Thermocline" means the plane of maximum rate of decrease of temperature with respect to depth in a thermally stratified body of water.

"Total Residual Chlorine" or "TRC" means those substances which include combined and uncombined forms of both chlorine and bromine and which are expressed, by convention, as an equivalent concentration of molecular chlorine. TRC is measured in ~~complaince~~~~accordance~~compliance with methods specified in 40 CFR 136, incorporated by reference in 35 Ill. Adm. Code 301.106.

"Toxic Substance" means a chemical substance that causes adverse effects in humans, or in aquatic or terrestrial animal or plant life. Toxic substances include, but are not limited to, those substances listed in 40 CFR 302.4, incorporated by reference in 35 Ill. Adm. Code 301.106, or any "chemical substance" as defined by the Illinois Chemical Safety Act [430 ILCS 45]

"ZID" or "Zone of Initial Dilution" means a portion of a mixing zone, identified pursuant to 35 Ill. Adm. ~~Code~~~~Section~~Code 302.102(e)~~ of this Part~~, within which acute toxicity standards need not be met.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.101 Scope and Applicability

a) This Part contains~~ schedules of~~ water quality standards which ~~apply~~are ~~applicable~~apply throughout the State as designated in 35 Ill. Adm. Code 303. Site specific water quality standards are found with the water use designations in 35 Ill. Adm. Code 303.

b) Subpart B contains general use water quality standards which must be met in waters of the State for which there is no specific use designation (35 Ill. Adm. Code 303.201).

c) Subpart C contains the public and food processing water supply standards. These are cumulative with Subpart B and must be met by all designated waters at the point at which water is drawn for treatment and distribution as a potable supply or for food processing (35 Ill. Adm. Code 303.202).

d) Subpart D contains the Chicago Area ~~Water~~Waterway System and the Lower Des

Plaines River water quality standards. These standards must be met only by certain waters designated in 35 Ill. Adm. Code 303.204, 303.220, 303.225, 303.227, 303.230, 303.235, 303.240 and 303.449. Subpart D also contains water quality standards applicable to indigenous aquatic life waters found only in the South Fork of the South Branch of the Chicago River (Bubbly Creek).

e) Subpart E contains the Lake Michigan Basin water quality standards. These must be met in the waters of the Lake Michigan Basin as designated in 35 Ill. Adm. Code 303.443.

f) Subpart F contains the procedures for determining each of the criteria designated in 35 Ill. Adm. ~~CodeSections~~Code 302.210 and 302.410.

~~g) Unless the contrary is clearly indicated, all references to "Parts" or "Sections" are to Ill. Adm. Code, Title 35: Environmental Protection. For example, "Part 309" is 35 Ill. Adm. Code 309, and "Section 309.101" is 35 Ill. Adm. Code 309.101.~~

(Source: Amended at 46 Ill. Reg. _____, effective ~~–~~_____)

Section 302.102 Allowed Mixing, Mixing Zones and ZIDs

a) Whenever a water quality standard is more restrictive than its corresponding effluent standard, or where there is no corresponding effluent standard specified at 35 Ill. Adm. Code 304, an opportunity will ~~shall~~ be allowed for compliance with 35 Ill. Adm. Code 304.105 by mixture of an effluent with its receiving waters, provided the discharger has made every effort to comply with the requirements of 35 Ill. Adm. Code 304.102.

b) The portion, volume and area of any receiving waters within which mixing is allowed pursuant to subsection (a) must ~~shall~~ be limited by the following:

1) Mixing must be confined in an area or volume of the receiving water no larger than the area or volume which would result after incorporation of outfall design measures to attain optimal mixing efficiency of effluent and receiving waters. These measures may include the~~, but are not limited to,~~ use of diffusers and engineered location and configuration of discharge points.

2) Mixing is not allowed in waters which include a tributary stream entrance if the mixing occludes the tributary mouth or otherwise restricts the movement of aquatic life into or out of the tributary.

3) Mixing is not allowed in water adjacent to bathing beaches, bank fishing areas, boat ramps or dockages or any other public access area.

4) Mixing is not allowed in waters containing mussel beds, endangered species habitat, fish spawning areas, areas of important aquatic life habitat, or any other natural features vital to the well being of aquatic life in ~~such~~ a manner that ~~maintainingthe maintenance of~~maintaining aquatic life in the body of water as a whole would be adversely affected.

5) Mixing is not allowed in waters that contain intake structures of public or food processing water supplies, points of withdrawal of water for irrigation, or watering areas accessed by wild or domestic animals.

6) Mixing must allow for a zone of passage for aquatic life in which water quality standards are met. However, a zone of passage is not required in receiving streams that have zero flow for at least seven consecutive days recurring on average in nine years out of 10.

7) The area and volume in which mixing occurs, alone or in combination with other areas and volumes of mixing, must not intersect any area of any body of water in such a manner that the maintenance of aquatic life in the body of water as a whole would be adversely affected.

8) The area and volume in which mixing occurs, alone or in combination with other areas and volumes of mixing, must not contain more than 25% of the cross-sectional area or volume of flow of a stream except for those streams for which the dilution ratio is less than 3:1. In streams where the dilution ratio is less than 3:1, the volume in which mixing occurs, alone or in combination with other volumes of mixing, must not contain more than 50 % of the volume flow unless an applicant for an NPDES permit demonstrates, pursuant to subsection (d), that an adequate zone of passage is provided for pursuant to subsection (b)(6).

9) No mixing is allowed when the water quality standard for the constituent

in question is already violated in the receiving water.

10) No body of water may be used totally for mixing of single outfall or combination of outfalls, except as provided in subsection (b)(6).

11) Single sources of effluents that have more than one outfall mustshallmust be limited to a total area and volume of mixing no larger than that allowable if a single outfall were used.

12) The area and volume in which mixing occurs must be as small as is practicable under the limitations prescribed in this subsection (b), and in no circumstances may the mixing encompass a surface area larger than 26 acres.

c) All water quality standards of this Part must be met at every point outside of the area and volume of the receiving water within which mixing is allowed. The acute toxicity standards of this Part must be met within the area and volume within which mixing is allowed, except as provided in subsection (e).

d) Pursuant to the procedures of Section 39 of the Act and 35 Ill. Adm. Code 309, a person may apply to the Agency to include as a condition in an NPDES permit formal definition of the area and volume of the waters of the State within which mixing is allowed for the NPDES discharge in question. The defined area and volume of allowed mixing shall constitute a "mixing zone" for the purposes of 35 Ill. Adm. Code: Subtitle C. Upon proof by the applicant that a proposed mixing zone conforms with the requirements of Section 39 of the Act, this sectionSection and any additional limitations as may be imposed by the Clean Water Act (CWA) (33 USCU.S.C. 1251 et seq.), the Act or Board regulations, the Agency mustshall, underpursuant tomust, under Section 39(b) of the Act, include within the NPDES permit a condition defining the mixing zone.

e) UnderPursuant toUnder the procedures of Section 39 of the Act and 35 Ill. Adm. Code 309, a person may apply to the Agency to include as a condition in an NPDES permit a ZID as a component portion of a mixing zone. The ZID must shall, at a minimum, be limited to waters within which effluent dispersion is immediate and rapid. For the purposes of this subsection, "immediate" dispersion means an effluent's merging with receiving waters without delay in time after its discharge and within close proximity of the end of the discharge pipe, so as to

minimize the length of exposure time of aquatic life to undiluted effluent, and "rapid" dispersion means an effluent's merging with receiving waters so as to minimize the length of exposure time of aquatic life to undiluted effluent. Upon proof by the applicant that a proposed ZID conforms with the requirements of Section 39 of the Act and this Section, the Agency must ~~undershall, pursuant to~~under Section 39(b) of the Act, include within the NPDES permit a condition defining the ZID.

f) Under ~~Pursuant to~~ Section 39 of the Act and 35 Ill. Adm. Code 309.103, an applicant for an NPDES permit must ~~shall~~ submit data to allow the Agency to determine that the nature of any mixing zone or mixing zone in combination with a ZID conforms with the requirements of Section 39 of the Act and of this Section. A permittee may appeal Agency determinations concerning a mixing zone or ZID ~~underpursuant to~~under the procedures of Section 40 of the Act and 35 Ill. Adm. Code 309.181.

g) When a mixing zone is defined in an NPDES permit, the waters within that mixing zone, for the duration of that NPDES permit, constitutes ~~shall constitute~~ the sole waters within which mixing is allowed for the permitted discharge. It ~~willshall~~will not be a defense in any action brought pursuant to 35 Ill. Adm. Code 304.105 that the area and volume of waters within which mixing may be allowed pursuant to subsection (b) is less restrictive than the area or volume or waters encompassed in the mixing zone.

h) When a mixing zone is explicitly denied in a NPDES permit, no waters may be used for mixing by the discharge to which the NPDES permit applies, all other provisions of this Section notwithstanding.

i) Where an NPDES permit is silent on the matter of a mixing zone, or when no NPDES permit is in effect, the burden of proof ~~willshall~~will be on the discharger to demonstrate compliance with this Section in any action brought pursuant to 35 Ill. Adm. Code 304.105.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.103 Stream Flows

Except as otherwise provided in this Chapter, the water quality standards in this Part ~~shall~~ apply

at all times except during periods when flows are less than the average minimum seven day low flow which occurs once in ten years.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.105 Antidegradation

This ~~The purpose of this~~ Section protects ~~is to protect~~ existing uses of all waters of the State of Illinois, maintains ~~maintain~~ the quality of waters with quality that is better than water quality standards, and prevents ~~prevent~~ unnecessary deterioration of waters of the State.

a) Existing Uses

Uses actually attained in a surface water body or water body segment on or after November 28, 1975, whether or not they are included in the water quality standards, must be maintained and protected. Examples of degradation of existing uses of the waters of the State include:

1) an action that would result in the deterioration of the existing aquatic community, such as a shift from a community of predominantly pollutant-sensitive species to pollutant-tolerant species or a loss of species diversity;

2) an action that would result in a loss of a resident or indigenous species whose presence is necessary to sustain commercial or recreational activities; or

3) an action that would preclude continued use of a surface water body or water body segment for a public water supply or for recreational or commercial fishing, swimming, paddling or boating.

b) Outstanding Resource Waters

1) Waters that are designated as Outstanding Resource Waters (ORWs) pursuant to 35 Ill. Adm. Code 303.205 and listed in 35 Ill. Adm. Code 303.206 must not be lowered in quality except as provided below:

A) Activities that result in short-term, temporary (i.e., weeks or months) lowering of water quality in an ORW; or

B) Existing site stormwater discharges that comply with applicable federal and State stormwater management regulations and do not result in a violation of any water quality standards.

2) Any activity in subsection (b)(1)(A) or (b)(1)(B) that requires a National Pollutant Discharge Elimination System (NPDES) permit or a Clean Water Act (CWA) Section 401 certification must also comply with subsection (c)(2).

3) Any activity listed in subsection (b)(1) or any other proposed increase in pollutant loading to an ORW must also meet the following requirements:

A) All existing uses of the water will be fully protected; and

B) Except for activities falling under one of the exceptions provided in subsection (b)(1)(A) or (B) above:

i) The proposed increase in pollutant loading is necessary for an activity that will improve water quality in the ORW; and

ii) The improvement could not be practicably achieved without the proposed increase in pollutant loading.

4) Any proposed increase in pollutant loading requiring an NPDES permit or a CWA 401 certification for an ORW must be assessed pursuant to subsection (f) to determine compliance with this Section.

c) High Quality Waters

1) Except as otherwise provided in subsection (d) ~~of this Section~~, waters of the State whose existing quality is better than any of the established standards of this Part must be maintained in their present high quality, unless the lowering of water quality is necessary to accommodate important economic or social development.

2) The Agency must assess any proposed increase in pollutant loading that necessitates a new, renewed or modified NPDES permit or any activity

requiring a CWA Section 401 certification to determine compliance with this Section. The assessment to determine compliance with this Section must be made on a case-by-case basis. In making this assessment, the Agency must:

A) Consider the fate and effect of any parameters proposed for an increased pollutant loading.

B) Assure the following:

i) The applicable numeric or narrative water quality standard will not be exceeded as a result of the proposed activity;

ii) All existing uses will be fully protected;

iii) All technically and economically reasonable measures to avoid or minimize the extent of the proposed increase in pollutant loading have been incorporated into the proposed activity; and

iv) The activity that results in an increased pollutant loading will benefit the community at large.

C) ~~Use~~~~Utilize~~Use the following information sources, when available:

i) Information, data or reports available to the Agency from its own sources;

ii) Information, data or reports supplied by the applicant;

iii) Agency experience with factually similar permitting scenarios; and

iv) Any other valid information available to the Agency.

d) Activities Not Subject to a Further Antidegradation Assessment
The following activities will not be subject to a further antidegradation assessment ~~underpursuant to~~under subsection (c)~~ of this Section~~.

1) Short-term, temporary (i.e., weeks or months) lowering of water quality;

2) Bypasses that are not prohibited at 40 CFR 122.41(m), incorporated by reference at 35 Ill. Adm. Code 301.106;

3) Response actions ~~underpursuant to~~under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, corrective actions, ~~underpursuant to~~under the Resource Conservation and Recovery Act (RCRA), as amended, or similar federal or State authority, taken to alleviate a release into the environment of hazardous substances, pollutants or contaminants which may pose a danger to public health or welfare;

4) Thermal discharges that have been approved through a CWA Section 316(a) demonstration;

5) New or increased discharges of a non-contact cooling water:

   A) without additives, except as provided in subsection (d)(5)(B), returned to the same body of water from which it was taken, as defined by 35 Ill. Adm. Code 352.104, provided that the discharge complies with applicable Illinois thermal standards; or

   B) containing chlorine when the non-contact cooling water is treated to remove residual chlorine, and returned to the same body of water from which it was taken, as defined in 35 Ill. Adm. Code 352.104, provided that the discharge complies with applicable Illinois thermal and effluent standards at 35 Ill. Adm. Code 302, 303, and 304;

6) Discharges permitted under a current general NPDES permit as provided by 415 ILCS 5/39(b) or a nationwide or regional CWA Section 404 permit are not subject to facility-specific antidegradation review; however, the Agency must assure that individual permits or certifications are required prior to all new pollutant loadings or hydrological modifications that necessitate a new, renewed or modified NPDES permit or CWA Section 401 certification that affects waters of particular biological significance,

which may include streams identified by the Illinois Department of Natural Resources as "biologically significant~~". Waters of particular biological significance may include streams listed in a 1991 publication by the Illinois Department of Conservation entitled "Biologically Significant Illinois Streams"~~"; or

7) Changing or ~~including~~~~Changes to or inclusion of~~including a new permit limitation that does not result in an actual increase of a pollutant loading, such as those stemming from improved monitoring data, new analytical testing methods, new or revised technology or water quality based effluent limits.

e) Lake Michigan Basin

Waters in the Lake Michigan basin as identified in 35 Ill. Adm. Code 303.443 are also subject to the requirements applicable to bioaccumulative chemicals of concern found at 35 Ill. Adm. ~~Code~~~~Section~~Code 302.521~~ of this Part~~.

f) Antidegradation Assessments

In conducting an antidegradation assessment ~~underpursuant to~~under this Section, the Agency must comply with the following procedures.

1) A permit application for any proposed increase in pollutant loading that necessitates the issuance of a new, renewed, or modified NPDES permit or a CWA Section 401 certification must include, to the extent necessary for the Agency to determine that the permit application meets the requirements of this Section, the following information:

A) Identification and characterization of the water body affected by the proposed load increase or proposed activity and the existing water body~~'~~'s uses. Characterization must address physical, biological and chemical conditions of the water body.

B) Identification and quantification of the proposed load increases for the applicable parameters and of the potential impacts of the proposed activity on the affected waters.

C) The purpose and anticipated benefits of the proposed activity. Such benefits may include:

i) Providing a centralized wastewater collection and treatment system for a previously unsewered community;

ii) ~~Expanding~~~~Expansion~~Expanding to provide service for anticipated residential or industrial growth consistent with a community~~'~~'s long range urban planning;

iii) ~~Adding~~~~Addition of~~Adding a new product line or production increase or modification at an industrial facility; or

iv) Increasing or ~~retaining~~~~An increase or the retention of~~retaining current employment levels at a facility.

D) Assessments of alternatives to proposed increases in pollutant loading or activities subject to Agency certification ~~underpursuant to~~under Section 401 of the CWA that result in less of a load increase, no load increase or minimal environmental degradation. Such alternatives may include:

i) Additional treatment levels, including no discharge alternatives;

ii) Discharge of waste to alternate locations, including publicly-owned treatment works and streams with greater assimilative capacity; or

iii) Manufacturing practices that incorporate pollution prevention techniques.

E) Any additional information the Agency may request.

F) Proof that a copy of the application has been provided to the Illinois Department of Natural Resources.

2) The Agency must complete an antidegradation assessment in ~~compliance~~~~accordance~~compliance with the provisions of this Section on a case-by-case basis.

A) The Agency must consider the criteria stated in 35 Ill. Adm. ~~Code~~~~Section~~Code 302.105(c)(2).

B) The Agency must consider the information provided by the applicant ~~underpursuant to~~under subsection (f)(1).

C) After its assessment, the Agency must produce a written analysis addressing the requirements of this Section and provide a decision yielding one of the following results:

i) If the proposed activity meets the requirements of this Section, then the Agency must proceed with public notice of the NPDES permit or CWA Section 401 certification and include the written analysis as a part of the fact sheet accompanying the public notice;

ii) If the proposed activity does not meet the requirements of this Section, then the Agency must provide a written analysis to the applicant and must be available to discuss the deficiencies that led to the disapproval. The Agency may suggest methods to remedy the conflicts with the requirements of this Section;

iii) If the proposed activity does not meet the requirements of this Section, but some lowering of water quality is allowable, then the Agency will contact the applicant with the results of the review. If the reduced loading increase is acceptable to the applicant, upon the receipt of an amended application, the Agency will proceed to public notice; or if the reduced loading increase is not acceptable to the applicant, the Agency will transmit its written review to the applicant in the context of an NPDES permit denial or a CWA Section 401 certification denial.

3) The Agency will conduct public notice and public participation through the public notice procedures found in 35 Ill. Adm. Code 309.109 or CWA

Section 401 certifications. The Agency must incorporate the following information into a fact sheet accompanying the public notice:

A) A description of the activity, including identification of water quality parameters for which there will be an increased pollutant loading;

B) Identification of the affected surface water body or water body segment, any downstream surface water body or water body segment also expected to experience a lowering of water quality, characterization of the designated and current uses of the affected surface water body or water body segment and identification of which uses are most sensitive to the proposed load increase;

C) A summary of any review comments and recommendations provided by Illinois Department of Natural Resources, local or regional planning commissions, zoning boards and any other entities the Agency consults regarding the proposal;

D) An overview of alternatives considered by the applicant and identification of any provisions or alternatives imposed to lessen the load increase associated with the proposed activity; and

E) The name and telephone number of a contact person at the Agency who can provide additional information.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

SUBPART B: GENERAL USE WATER QUALITY STANDARDS

Section 302.201 Scope and Applicability

Subpart B contains general use water quality standards which must be met in waters of the State for which there is no specific designation (35 Ill. Adm. ~~Code~~~~Section~~Code 303.201).

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.202 Purpose

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The General Use standards will protect the State's water for aquatic life ~~(except as provided in Section 302.213)~~, wildlife, agricultural use, secondary contact use and most industrial uses and ensure the aesthetic quality of the State's aquatic environment. Primary contact uses are protected for all General Use waters whose physical configuration permits such use.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.203 Offensive Conditions

Waters of the State must ~~shall~~ be free from sludge or bottom deposits, floating debris, visible oil, odor, plant or algal growth, color or turbidity of other than natural origin. The allowed mixing provisions of 35 Ill. Adm. ~~Code~~~~Section~~Code 302.102 must ~~shall~~ not be used to comply with the provisions of this Section.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.204 pH

pH~~(STORET number 00400)~~ must ~~shall~~ be within the range of 6.5 to 9.0 except for natural causes.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.205 Phosphorus

Phosphorus ~~(STORET number 00665)~~: After December 31, 1983, Phosphorus as P must ~~shall~~ not exceed 0.05 milligram per liter (mg/~~l~~L) in any reservoir or lake with a surface area of 8.1 hectares (20 acres) or more, or in any stream at the point where it enters any such reservoir or lake. For ~~the purposes of~~ this Section, the term "reservoir or lake" does ~~shall~~ not include low level pools constructed in free flowing streams or any body of water which is an integral part of an operation which includes the application of sludge on land. Point source discharges which comply with 35 Ill. Adm. ~~Code~~~~Section~~Code 304.123 must ~~shall~~ be in compliance with this Section for purposes of application of 35 Ill. Adm. ~~Code~~~~Section~~Code 304.105.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.206 Dissolved Oxygen

General use waters must maintain dissolved oxygen concentrations at or above the values contained in subsections (a), (b) and (c) ~~of this Section~~.

a) General use waters at all locations must maintain sufficient dissolved oxygen concentrations to prevent offensive conditions as required in 35 Ill. Adm. ~~Code~~~~Section~~Code 302.203 ~~of this Part~~. Quiescent and isolated sectors of General Use waters including ~~but not limited to~~ wetlands, sloughs, backwaters and waters below the thermocline in lakes and reservoirs must be maintained at sufficient dissolved oxygen concentrations to support their natural ecological functions and resident aquatic communities.

b) Except in those waters identified in Appendix D ~~of this Part~~, the dissolved oxygen concentration in the main body of all streams, in the water above the thermocline of thermally stratified lakes and reservoirs, and in the entire water column of unstratified lakes and reservoirs must not be less than the following:

1) During the period of March through July,

A) 5.0 mg/L at any time; and

B) 6.0 mg/L as a daily mean averaged over 7 days.

2) During the period of August through February,

A) 3.5 mg/L at any time;

B) 4.0 mg/L as a daily minimum averaged over 7 days; and

C) 5.5 mg/L as a daily mean averaged over 30 days.

c) The dissolved oxygen concentration in all sectors within the main body of all streams identified in Appendix D ~~of this Part~~ must not be less than:

1) During the period of March through July,

A) 5.0 mg/L at any time; and

B) 6.25 mg/L as a daily mean averaged over 7 days.

2) During the period of August through February,

A) 4.0 mg/L at any time;

B) 4.5 mg/L as a daily minimum averaged over 7 days; and

C) 6.0 mg/L as a daily mean averaged over 30 days.

d) Assessing attainment of dissolved oxygen mean and minimum values.

1) Daily mean is the arithmetic mean of dissolved oxygen concentrations in 24 consecutive hours.

2) Daily minimum is the minimum dissolved oxygen concentration in 24 consecutive hours.

3) The measurements of dissolved oxygen used to determine attainment or lack of attainment with any of the dissolved oxygen standards in this Section must assure daily minima and daily means that represent the true daily minima and daily means.

4) The dissolved oxygen concentrations used to determine a daily mean or daily minimum should not exceed the air-equilibrated concentration.

5) "~~"~~Daily minimum averaged over 7 days"~~"~~ means the arithmetic mean of daily minimum dissolved oxygen concentrations in 7 consecutive 24-hour periods.

6) "~~"~~Daily mean averaged over 7 days"~~"~~ means the arithmetic mean of daily mean dissolved oxygen concentrations in 7 consecutive 24-hour periods.

7) "~~"~~Daily mean averaged over 30 days"~~"~~ means the arithmetic mean of daily mean dissolved oxygen concentrations in 30 consecutive 24-hour periods.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

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Section 302.207 Radioactivity

a) Gross beta ~~(STORET number 03501)~~ concentration must ~~shall~~ not exceed 100 picocuries per liter (pCi/L).

~~b)~~ b) Strontium 90 ~~(STORET number 13501)~~ concentration must not exceed 2 ~~picocuries per liter (~~pCi/L~~)~~.

c) The annual average radium 226 and 228 ~~(STORET number 11503)~~ combined concentration must not exceed 3.75 ~~picocuries per liter (~~pCi/L~~)~~.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.208 Numeric Standards for Chemical Constituents

a) The acute standard (AS) for the chemical constituents listed in subsection (e) must ~~shall~~ not be exceeded at any time except for those waters for which a zone of initial dilution (ZID) has been approved by the Agency ~~underpursuant to~~under 35 Ill. Adm. ~~Code~~~~Section~~Code 302.102.

b) The chronic standard (CS) for the chemical constituents listed in subsection (e) must ~~shall~~ not be exceeded by the arithmetic average of at least four consecutive samples collected over any period of at least four days, except for those waters in which the Agency has approved a mixing zone or in which mixing is allowed ~~underpursuant to~~under 35 Ill. Adm. ~~Code~~~~Section~~Code 302.102. The 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. For the chemical constituents that have water quality based standards dependent upon hardness, the chronic water quality standard will be calculated according to subsection (e) using the hardness of the water body at the time the sample was collected. To calculate attainment status of chronic--standards, the concentration of the chemical constituent in each sample is divided by the calculated water quality standard for the sample to determine a quotient. The water quality standard is attained if the mean of the sample quotients is less than or equal to one for the duration of the averaging period.

c) The human health standard (HHS) for the chemical constituents listed in subsection (f) must ~~shall~~ not be exceeded when the stream flow is at or above the

harmonic mean flow ~~underpursuant to~~under 35 Ill. Adm. ~~Code~~~~Section~~Code 302.658 nor ~~mustshall~~must an annual average, based on at least eight samples, collected in a manner representative of the sampling period, exceed the HHS except for those waters in which the Agency has approved a mixing zone or in which mixing is allowed under 35 Ill. Adm. ~~Codepursuant to Section~~Code 302.102.

d) The standard for the chemical constituents of subsections (g) and (h) must ~~shall~~ not be exceeded at any time except for those waters in which the Agency has approved a mixing zone or in which mixing is allowed under 35 Ill. Adm. ~~Codepursuant to Section~~Code 302.102.

e) Numeric Water Quality Standards for the Protection of Aquatic Organisms

Constituent	AS (µg/L)	CS (µg/L)
Arsenic (trivalent, dissolved)	360 ~~x~~x 1.0* = 360	190 ~~x~~x 1.0* = 190
Boron (total)	40,100	7,600
Cadmium (dissolved)	$e^{A+B\ln(H)} \times \{1.138672 - [(\ln(H))(0.041838)]\}$ $e^{A+B\ln(H)} \times \{1.138672 - [(\ln(H))(0.041838)]\}$* where A = -2.918 and B = 1.128	$e^{A+B\ln(H)} \times \{1.101672 - [(\ln(H))(0.041838)]\}$ $e^{A+B\ln(H)} \times \{1.101672 - [(\ln(H))(0.041838)]\}$* where A = -3.490 and B = 0.7852
Chromium (hexavalent, total)	16	11
Chromium	$e^{A+B\ln(H)} \times 0.316$ *	$e^{A+B\ln(H)} \times 0.860$ *

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(trivalent, dissolved)	$e^{A+B\ln(H)} \times 0.316$ *	$e^{A+B\ln(H)} \times 0.860$ *
	where A = 3.688 and B = 0.8190	where A = 1.561 and B = 0.8190
Copper (dissolved)	$e^{A+B\ln(H)} \times 0.960$ * $e^{A+B\ln(H)} \times 0.960$ *	$e^{A+B\ln(H)} \times 0.960$ * $e^{A+B\ln(H)} \times 0.960$ *
	where A = -1.464 and B = 0.9422	where A = -1.465 and B = 0.8545
Cyanide**	22	5.2
Fluoride (total)	$e^{A+B\ln(H)}$ $e^{A+B\ln(H)}$	$e^{A+B\ln(H)}$ $e^{A+B\ln(H)}$, but ~~mustshall~~must not exceed 4.0 mg/L ~~where A = 6.0445 and B = 0.5394~~ where A = 6.0445 and B = 0.5394
	where A = 6.7319 and B = 0.5394	
Lead (dissolved)	~~$e^{A+B\ln(H)} \times \{1.46203 - [(\ln(H))(0.145712)]\}$ *~~ $e^{A+B\ln(H)} \times \left\{1.46203 - [(\ln(H))(0.145712)]\right\}$ *	~~$e^{A+B\ln(H)} \times \{1.46203 - [(\ln(H))(0.145712)]\}$ *~~ $e^{A+B\ln(H)} \times \left\{1.46203 - (\ln(H))(0.145712)\right\}$ *
	where A = -1.301 and B = 1.273	where A = -2.863 and B = 1.273
Manganese (dissolved)	$e^{A+B\ln(H)} \times 0.9812$*	$e^{A+B\ln(H)} \times 0.9812$*

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~~Manganese (dissolved)~~	$e^{A+B\ln(H)} \times$ ~~0.9812*~~ where $A = 4.9187$ and $B = 0.7467$	$e^{A+B\ln(H)} \times$ ~~0.9812*~~ where $A = 4.0635$ and $B = 0.7467$
Mercury (dissolved)	2.6 ~~x~~ x 0.85* = 2.2	1.3 ~~x~~ x 0.85* = 1.1
Nickel (dissolved)	$e^{A+B\ln(H)} \times 0.998$ * $e^{A+B\ln(H)} \times 0.998$ * where $A = 0.5173$ and $B = 0.8460$	$e^{A+B\ln(H)} \times 0.997$ * $e^{A+B\ln(H)} \times 0.997$ * where $A = -2.286$ and $B = 0.8460$
TRC	19	11
Zinc (dissolved)	$e^{A+B\ln(H)} \times 0.978$ * $e^{A+B\ln(H)} \times 0.978$ * where $A = 0.9035$ and $B = 0.8473$	$e^{A+B\ln(H)} \times 0.986$ * $e^{A+B\ln(H)} \times 0.986$ * where $A = -0.4456$ and $B = 0.8473$
Benzene	4200	860
Ethylbenzene	150	14
Toluene	2000	600
Xylene(s)	920	360

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where:

µg/L	=	microgram per liter
e^x	=	base of natural logarithms raised to the x-power
ln(*H*)	=	natural logarithm of Hardness (in mg/L as $CaCO_3$)
*	=	conversion factor multiplier for dissolved metals

** = standard to be evaluated using either of the following USEPA approved methods, incorporated by reference at 35 Ill. Adm. Code 301.106: Method OIA-1677, DW: Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry, January 2004, Document Number EPA-821-R-04-001 or Cyanide Amenable to Chlorination, Standard Methods 4500-CN-G (40 CFR 136.3)

f) Numeric Water Quality Standard for the Protection of Human Health

Constituent	(µg/L)
Mercury (total)	0.012
Benzene	310

where:
µg/L = micrograms per liter

g) Single-value standards apply at the following concentrations for these substances:

Constituent	Unit		Standard
Barium (total)	mg/L		5.0
Chloride (total)	mg/L		500
Iron (dissolved)	mg/L	~~01046~~	1.0
Phenols	mg/L		0.1

Selenium (total)	mg/L	1.0
Silver (total)	µg/L	5.0

where:
mg/L = milligram per liter and
µg/L = microgram per liter

h) Water quality standards for sulfate are as follows:

1) At any point where water is withdrawn or accessed for purposes of livestock watering, the average of sulfate concentrations must not exceed 2,000 mg/L when measured at a representative frequency over a 30 day period.

2) The results of the following equations provide sulfate water quality standards in mg/L for the specified ranges of hardness (in mg/L as $CaCO_3$) and chloride (in mg/L) and must be met at all times:

A) If the hardness concentration of receiving waters is greater than or equal to 100 mg/L but less than or equal to 500 mg/L, and if the chloride concentration of waters is greater than or equal to 25 mg/L but less than or equal to 500 mg/L, then:

C = [1276.7 + 5.508 (hardness) - 1.457 (chloride)] * 0.65

where:

C = sulfate concentration

B) If the hardness concentration of waters is greater than or equal to 100 mg/L but less than or equal to 500 mg/L, and if the chloride concentration of waters is greater than or equal to 5 mg/L but less than 25 mg/L, then:

C = [-57.478 + 5.79 (hardness) + 54.163 (chloride)] * 0.65

where:

C = sulfate concentration

3) The following sulfate standards must be met at all times when hardness (in mg/L as $CaCO_3$) and chloride (in mg/L) concentrations other than specified in (h)(2) are present:

A) If the hardness concentration of waters is less than 100 mg/L or chloride concentration of waters is less than 5 mg/L, the sulfate standard is 500 mg/L.

B) If the hardness concentration of waters is greater than 500 mg/L and the chloride concentration of waters is 5 mg/L or greater, the sulfate standard is 2,000 mg/L.

C) If the combination of hardness and chloride concentrations of existing waters are not reflected in subsection (h)(3)(A) or (B), the sulfate standard may be determined in a site-specific rulemaking under ~~pursuant to~~ section 303(c) of the Federal Water Pollution Control Act of 1972 (Clean Water Act), 33 ~~USC~~U.S.C. 1313, and Federal Regulations at 40 CFR 131.10(j)(2).

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.209 Fecal Coliform

a) During the months May through October, based on a minimum of five samples taken over not more than a 30 day period, fecal coliform ~~(STORET number 31616)~~ must ~~shall~~ not exceed a geometric mean of 200 per 100 milliliter (ml), nor ~~mustshall~~must more than 10% of the samples during any 30 day period exceed 400 per 100 ml in protected waters. Protected waters are defined as waters which, due to natural characteristics, aesthetic value or environmental significance are deserving of protection from pathogenic organisms. Protected waters will meet one or both of the following conditions:

1) presently support or have the physical characteristics to support primary contact;

2) flow through or adjacent to parks or residential areas.

b) Waters unsuited to support primary contact uses because of physical, hydrologic or geographic configuration and are located in areas unlikely to be frequented by the public on a routine basis as determined by the Agency at 35 Ill. Adm. Code 309.Subpart A, are exempt from this standard.

c) The Agency must~~ shall~~ apply this rule as required by~~ pursuant to~~ 35 Ill. Adm. Code 304.121.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.210 Other Toxic Substances

Waters of the State must~~ 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.

a) Any substance or combination of substances must~~ shall~~ be deemed to be toxic or harmful to aquatic life if present in concentrations that exceed the following:

1) An Acute Aquatic Toxicity Criterion (AATC) validly derived and correctly applied ~~underpursuant to~~under procedures ~~set forth~~ in 35 Ill. Adm. ~~Code~~~~Sections~~Code 302.612 through 302.618 or in 35 Ill. Adm. ~~Code~~~~Section~~Code 302.621; or

2) A Chronic Aquatic Toxicity Criterion (CATC) validly derived and correctly applied ~~underpursuant to~~ under procedures ~~set forth~~ in 35 Ill. Adm. ~~Code~~~~Sections~~Code 302.627 or 302.630.

b) Any substance or combination of substances must~~ shall~~ be deemed to be toxic or harmful to wild or domestic animal life if present in concentrations that exceed any Wild and Domestic Animal Protection Criterion (WDAPC) validly derived and correctly applied ~~underpursuant to~~under 35 Ill. Adm. ~~Code~~~~Section~~Code 302.633.

c) Any substance or combination of substances must ~~shall~~ be deemed to be toxic or harmful to human health if present in concentrations that exceed criteria, validly derived and correctly applied, based on either of the following:

1) Disease or functional impairment due to a physiological mechanism for which there is a threshold dose below which no damage occurs calculated ~~underpursuant to~~under 35 Ill. Adm. ~~Code~~~~Sections~~Code 302.642 through 302.648 (Human Threshold Criterion); or

2) Disease or functional impairment due to a physiological mechanism for which any dose may cause some risk of damage calculated under 35 Ill. Adm. ~~Codepursuant to Sections~~Code 302.651 through 302.658 (Human Nonthreshold Criterion).

d) The most stringent criterion of subsections (a), (b), and (c) ~~appliesshall apply~~applies at all points outside of any waters within which, mixing is allowed under 35 Ill. Adm ~~Codepursuant to Section~~. Code 302.102. In addition, the AATC derived ~~underpursuant to~~under subsection (a)(1) applies ~~shall apply~~ in all waters except that it must ~~shall~~ not apply within a ZID that is prescribed in ~~complianceaccordance~~compliance with 35 Ill. Adm. ~~Code~~~~Section~~Code 302.102.

e) The procedures of Subpart F set forth minimum data requirements, appropriate test protocols and data assessment methods for establishing criteria under ~~pursuant to~~ subsections (a), (b), and (c). No other procedures may be used to establish such criteria unless approved by the Board in a rulemaking or adjusted standards proceeding under ~~pursuant to~~ Title VII of the Act. The validity and applicability of the Subpart F procedures may not be challenged in any proceeding brought under ~~pursuant to~~ Titles VIII or X of the Act, although the validity and correctness of application of the numeric criteria derived under ~~pursuant to~~ Subpart F may be challenged in such proceedings under ~~pursuant to~~ subsection (f).

f) Challenges to application of criteria

1) A permittee may challenge the validity and correctness of application of a criterion derived by the Agency under ~~pursuant to~~ this Section only at the time such criterion is first applied in an NPDES permit under ~~pursuant to~~ 35 Ill. Adm. Code 309.152 or in an action under ~~pursuant to~~ Title VIII of

the Act for violation of the toxicity water quality standard. Failure of a person to challenge the validity of a criterion at the time of its first application ~~willshall~~will constitute a waiver of such challenge in any subsequent proceeding involving application of the criterion to that person.

2) Consistent with subsection (f)(1), if a criterion is included as, or is used to derive, a condition of an NPDES discharge permit, a permittee may challenge the criterion in a permit appeal ~~underpursuant to~~under Section 40 of the Act and 35 Ill. Adm. Code 309.181. ~~In any such action, the Agency shall include in the record all information upon which it has relied in developing and applying the criterion, whether such information was developed by the Agency or submitted by the Petitioner. THE BURDEN OF PROOF SHALL BE ON THE PETITIONER TO DEMONSTRATE THAT THE CRITERION-BASED CONDITION IS NOT NECESSARY TO ACCOMPLISH THE PURPOSES OF SUBSECTION (a) (Section 40(a)(1) of the Act), but there is no presumption in favor of the general validity and correctness of the application of the criterion as reflected in the challenged condition.~~

3) Consistent with subsection (f)(1), in an action where alleged violation of the toxicity water quality standard is based on alleged excursion of a criterion, the person bringing such action ~~willshall~~will have the burdens of going forward with proof and of persuasion regarding the general validity and correctness of application of the criterion.

g) Subsections (a) through (e) do not apply to USEPA registered pesticides approved for aquatic application and applied ~~underpursuant to~~under the following conditions:

1) Application must ~~shall~~ be made in strict ~~complianceaccordance~~compliance with label directions;

2) Applicator must ~~shall~~ be properly certified under the provisions of the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 135 et seq. (1972));

3) Applications of aquatic pesticides must be in

~~compliance~~~~accordance~~compliance with the laws, regulations and guidelines of all state and federal agencies authorized by law to regulate, use or supervise pesticide applications~~, among which is included the Department of Energy and Natural Resources pursuant to Section 3 of "AN ACT in relation to natural resources, research, data collection and environmental studies", Ill. Rev. Stat. 1987 ch. 96 1/2, par. 7403~~.

4) Aquatic ~~No aquatic~~ pesticide must not ~~shall~~ be applied to waters affecting public or food processing water supplies unless a permit to apply the pesticide has been obtained from the Agency. All permits must ~~shall~~ be issued so as not to cause a violation of the Act or of any of the Board's rules or regulations. To aid applicators in determining their responsibilities under this subsection, a list of waters affecting public water supplies will be published and maintained by the Agency's Division of Public Water Supplies.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.211 Temperature

~~a) Temperature has STORET number (F°) 00011 and (C°) 00010.~~

a~~)b~~) There must not ~~shall~~ be ~~no~~ abnormal temperature changes that may adversely affect aquatic life unless caused by natural conditions.

b~~)c~~) The normal daily and seasonal temperature fluctuations which existed before the addition of heat due to other than natural causes ~~mustshall~~must be maintained.

c~~)d~~) The maximum temperature rise above natural temperatures must ~~shall~~ not exceed 2.8 ~~ºC~~°C (5 ºF)~~2.8° C (5° F)~~.

d~~)e~~) In addition, the water temperature at representative locations in the main river must ~~shall~~ not exceed the maximum limits in the following table during more than one percent of the hours in the 12-month period ending with any month. Moreover, ~~at no time shall~~ the water temperature at such locations must never exceed the maximum limits in the following table by more than 1.7 ºC (3 ºF)~~1.7° C (3° F)~~.

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	~~ºC~~	~~ºF~~		~~ºC~~	~~ºF~~
~~JAN.~~	~~16~~	~~60~~	~~JUL.~~	~~32~~	~~90~~
~~FEB.~~	~~16~~	~~60~~	~~AUG.~~	~~32~~	~~90~~
~~MAR.~~	~~16~~	~~60~~	~~SEPT.~~	~~32~~	~~90~~
~~APR.~~	~~32~~	~~90~~	~~OCT.~~	~~32~~	~~90~~
~~MAY~~	~~32~~	~~90~~	~~NOV.~~	~~32~~	~~90~~
~~JUNE~~	~~32~~	~~90~~	~~DEC.~~	~~16~~	~~60~~

	ºC	ºF		ºC	ºF
JAN	16	60	JUL.	32	90
FEB.	16	60	AUG.	32	90
MAR.	16	60	SEPT.	32	90
APR.	32	90	OCT.	32	90
MAY	32	90	NOV.	32	90
JUNE	32	90	DEC.	16	60

e~~)f~~) The owner or operator of a source of heated effluent which discharges 150 megawatts (0.5 billion British thermal units per hour) or more must ~~shall~~ demonstrate in a hearing before the ~~this Pollution Control Board (Board) not less than 5 nor more than 6 years after the effective date of these regulations or,~~Board in the case of new sources, after the commencement of operation, that discharges from that source have not caused and cannot be reasonably expected to cause significant ecological damage to the receiving waters. If the ~~demonstrationsuch proof~~demonstration is not made to the satisfaction of the Board, the Board must order appropriate corrective measures to be ~~implementedshall be ordered to be taken~~implemented within a reasonable time as determined by the Board.

f~~)g~~) Permits for heated effluent discharges, whether issued by the Board or the Illinois Environmental Protection Agency (Agency), can be revised if ~~shall be subject to revision in the event that~~ reasonable future development creates a need for reallocation of the assimilative capacity of the receiving stream as defined in the regulation above.

g~~)h~~) The owner or operator of a source of heated effluent must ~~shall~~ maintain ~~such~~ records and conduct ~~such~~ studies of the effluents from the ~~such~~ sources and of

their effects as may be required by the Agency or in any permit granted under the ~~Illinois Environmental Protection Act (Act)~~Act.

h~~i~~) Appropriate corrective measures will be required if, upon complaint filed in ~~compliance~~~~accordance~~compliance with Board rules, it is found at any time that any heated effluent causes significant ecological damage to the receiving stream.

i~~j~~) All effluents to an artificial cooling lake must comply with the applicable provisions of the thermal water quality standards ~~as set forth~~ in this Section and 35 Ill. Adm. Code 303, except when all of the following requirements are met:

1) All discharges from the artificial cooling lake to other waters of the State comply with the applicable provisions of subsections (~~ab~~a) through (~~de~~d).

2) The heated effluent discharged to the artificial cooling lake complies with all other applicable provisions of this Chapter, except subsections (~~ab~~a) through (~~de~~d).

3) At an adjudicative hearing the discharger must ~~shall~~ satisfactorily demonstrate to the Board that the artificial cooling lake receiving the heated effluent will be environmentally acceptable, and within the intent of the Act, including~~, but not limited to~~:

A) ~~providing~~~~provision of~~providing conditions capable of supporting shellfish, fish and wildlife, and recreational uses consistent with good management practices, and

B) ~~controlling~~~~control of~~controlling the thermal component of the discharger's effluent by a technologically feasible and economically reasonable method.

4) The required ~~demonstration~~~~showing~~demonstration in subsection (j)(3) may take the form of an acceptable final environmental impact statement or pertinent provisions of environmental assessments used in the preparation of the final environmental impact statement, or may take the form of a demonstration ~~under~~~~showing pursuant to~~under Section 316(a) of the Clean Water Act (CWA) (33 U.S.C. 1251 et seq.), which addresses the requirements of subsection (j)(3).

5) If the Board finds the demonstration to ~~be~~be adequate ~~showing~~ as provided in subsection (~~ij~~i)(3) ~~is found~~, the Board ~~mustshall~~must promulgate specific thermal standards to be applied to the discharge to that artificial cooling Lake.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.212 Total Ammonia Nitrogen

a) Total ammonia nitrogen ~~(as N: STORET Number 00610)~~ must in no case exceed 15 mg/L.

b) The total ammonia nitrogen ~~(as N: STORET Number 00610)~~ acute, chronic, and sub-chronic standards are determined by the equations given in subsections (b)(1) and (b)(2) ~~of this Section~~. Attainment of each standard must be determined by subsections (c) and (d) ~~of this Section~~ in mg/L.

1) The acute standard (AS) is calculated using the following equation:

~~$$AS = \frac{0.411}{1 + 10^{7.204 - pH}} + \frac{58.4}{1 + 10^{pH - 7.204}}$$~~

$$AS = \frac{0.411}{1 + 10^{7.204-pH}} + \frac{58.4}{1 + 10^{pH-7.204}}$$

2) The chronic standard (CS) is calculated using the following equations:

A) During the Early Life Stage Present period, as defined in subsection (e) ~~of this Section~~:

~~i)~~ i) When water temperature is less than or equal to 14.51~~°C~~ °C:

$$CS = \left\{ \frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right\} (2.85)$$

$$CS = \left\{ \frac{0.0577}{1 + 10^{7.688\text{-pH}}} + \frac{2.487}{1 + 10^{\text{pH-}7.688}} \right\} \quad (2.85)$$

~~ii)~~ ii) When water temperature is above 14.51~~°C~~ °C:

$$CS = \left\{ \frac{0.0577}{1+10^{7.688-\text{pH}}} + \frac{2.487}{1+10^{\text{pH}-7.688}} \right\} \left(1.45 * 10^{0.028*(25-T)}\right)$$

$$CS = \left\{ \frac{0.0577}{1 + 10^{7.688\text{-pH}}} + \frac{2.487}{1 + 10^{\text{pH-}7.688}} \right\} (1.45*10^{0.028*(25\text{-}T)})$$

Where T = Water Temperature, degrees Celsius

~~B)~~ B) During the Early Life Stage Absent period, as defined in subsection (e)~~ of this Section~~:

~~i)~~ i) When water temperature is less than or equal to 7~~°C~~ °C:

$$CS = \left\{ \frac{0.0577}{1+10^{7.688-\text{pH}}} + \frac{2.487}{1+10^{\text{pH}-7.688}} \right\} \left(1.45 * 10^{0.504}\right)$$

$$CS = \left\{ \frac{0.0577}{1 + 10^{7.688\text{-pH}}} + \frac{2.487}{1 + 10^{\text{pH-}7.688}} \right\} (1.45*10^{0.504})$$

~~ii)~~ ii) When water temperature is greater than 7~~°C~~ °C:

$$CS = \left\{ \frac{0.0577}{1+10^{7.688-\text{pH}}} + \frac{2.487}{1+10^{\text{pH}-7.688}} \right\} \left(1.45 * 10^{0.028(25-T)}\right)$$

$$CS = \left\{ \frac{0.0577}{1 + 10^{7.688\text{-pH}}} + \frac{2.487}{1 + 10^{\text{pH-}7.688}} \right\} (1.45*10^{0.028*(25\text{-}T)})$$

Where T = Water Temperature, degrees Celsius

3) The sub-chronic standard is equal to 2.5 times the chronic standard.

c) Attainment of the Total Ammonia Nitrogen Water Quality Standards

~~1)~~ 1) The acute standard of total ammonia nitrogen (in mg/L) must not be exceeded at any time except in those waters for which the Agency has approved a ZID under 35 Ill. Adm. ~~Code pursuant to Section~~Code 302.102.

~~2)~~ 2) The 30-day average concentration of total ammonia nitrogen (in mg/L~~)~~ must not exceed the chronic standard (CS) except in those waters in which mixing is allowed ~~underpursuant to~~under 35 Ill. Adm~~. Code Section~~. Code 302.102~~ of this Part~~. Attainment of the chronic standard (CS) is evaluated ~~underpursuant to~~under subsection (d)~~ of this Section~~ by averaging at least four samples collected at weekly intervals or at other sampling intervals that statistically represent a 30-day sampling period. The samples must be collected in a manner that assures a representative sampling period.

~~3)~~ 3) The 4-day average concentration of total ammonia nitrogen (in mg/L) must not exceed the sub-chronic standard except in those waters in which mixing is allowed under 35 Ill. Adm. ~~Code pursuant to Section~~Code 302.102. Attainment of the sub-chronic standard is evaluated pursuant to subsection (d) ~~of this Section~~ by averaging daily sample results collected over a period of four consecutive days within the 30-day averaging period. The samples must be collected in a manner that assures a representative sampling period.

d) The water quality standard for each water body must be calculated based on the temperature and pH of the water body measured at the time of each ammonia sample. The concentration of total ammonia in each sample must be divided by the calculated water quality standard for the sample to determine a quotient. The water quality standard is attained if the mean of the sample quotients is less than or equal to one for the duration of the averaging period.

e) The Early Life Stage Present period occurs from March through October. In

addition, during any other period when early life stages are present, and where the water quality standard does not provide adequate protection for these organisms, the water body must meet the Early Life Stage Present water quality standard. All other periods are subject to the Early Life Stage Absent period.

BOARD NOTE: Acute and chronic standard concentrations for total ammonia nitrogen (in mg/L) for different combinations of pH and temperature are shown in Appendix C.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

SUBPART C: PUBLIC AND FOOD PROCESSING WATER SUPPLY STANDARDS

Section 302.301 Scope and Applicability

Subpart C contains the public and food processing water supply standards. These are cumulative with the general use standards of Subpart B and must be met in all waters designated in Part 303 at any point at which water is withdrawn for treatment and distribution as a potable supply or for food processing. Waters of the State are generally designated for public and food processing use (35 Ill. Adm. ~~Code~~~~Section~~Code 303.202).

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.302 Algicide Permits

The water quality standards of Subparts B and C may be exceeded if ~~the~~~~such~~the occurrence results from ~~applying~~~~the application of~~applying an algicide ~~under~~~~in accordance with the terms of~~under an algicide permit issued by the Agency under 35 Ill. Adm. ~~Code~~~~pursuant to Part~~Code 602.

~~(Note: Prior to codification, Rules 203 and 204(d) of Ch 6: Public Water Supplies.)~~

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.303 Finished Water Standards

Water must ~~shall~~ be of such quality that with treatment consisting of coagulation, sedimentation, filtration, storage and chlorination, or other equivalent treatment processes, the treated water ~~meets~~~~shall meet in~~meets all ~~respects the~~ requirements of 35 Ill. Adm. ~~Code~~~~Part~~Code 611.

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~~(Note: Prior to codification, Table I, Rule 304 of Ch 6: Public Water Supplies)~~

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.304 Chemical Constituents

The following levels of chemical constituents must ~~shall~~ not be exceeded:

~~CONSTITUENT~~	~~CONCENTRATION (mg/L1)~~
~~Arsenic (total)~~	~~0.05~~
~~Barium (total)~~	~~1.0~~
~~Boron (total)~~	~~1.0~~
~~Cadmium (total)~~	~~0.010~~
~~Chloride (total)~~	~~250~~
~~Chromium~~	~~0.05~~
~~Fluoride (total)~~	~~1.4~~
~~Iron (dissolved)~~	~~0.3~~
~~Lead (total)~~	~~0.05~~
~~Manganese (total)~~	~~1.0~~
~~Nitrate Nitrogen~~	~~10~~
~~Oil (hexane solubles or equivalent)~~	~~0.1~~
~~Organics~~	
~~Pesticides~~	
~~Chlorinated Hydrocarbon Insecticides~~	
~~Aldrin~~	~~0.001~~
~~Chlordane~~	~~0.003~~
~~DDT~~	~~0.05~~
~~Dieldrin~~	~~0.001~~
~~Endrin~~	~~0.0002~~
~~Heptachlor~~	~~0.0001~~
~~Heptachlor Expoxide~~	~~0.0001~~
~~Lindane~~	~~0.004~~
~~Methoxychlor~~	~~0.1~~

~~Toxaphene 0.0005~~
~~Organophosphate~~
~~Insecticides~~
~~Parathion 0.1~~
~~Chlorophenoxy Herbicides~~
~~2,4-Dichlorophenoxy-~~
~~acetic acid (2,4-D) 0.1~~
~~2-(2,4,5-Trichloro-~~
~~phenoxy) propionic~~
~~acid (2,4,5-TP~~
~~or Silvex) 0.01~~
~~Phenols 0.001~~
~~Selenuim (total) 0.01~~
~~Sulphates 250~~
~~Total Dissolved Solids 500~~

CONSTITUENT	CONCENTRATION (mg/L)
Arsenic (total)	0.05
Barium (total)	1.0
Boron (total)	1.0
Cadmium (total)	0.010
Chloride (total)	250
Chromium	0.05
Fluoride (total)	1.4
Iron (dissolved)	0.3
Lead (total)	0.05
Manganese (total)	1.0
Nitrate-Nitrogen	10
Oil (hexane-solubles or equivalent)	0.1
Organics	
Pesticides	
Chlorinated Hydro-carbon Insecticides	
Aldrin	0.001
Chlordane	0.003

DDT	0.05
Dieldrin	0.001
Endrin	0.0002
Heptachlor	0.0001
Heptachlor Expoxide	0.0001
Lindane	0.004
Methoxychlor	0.1
Toxaphene	0.0005
Organophosphate Insecticides	
Parathion	0.1
Chlorophenoxy Herbicides	
2,4-Dichlorophenoxy-acetic acid (2,4-D)	0.1
2-(2,4,5-Trichloro-phenoxy)-propionic acid (2,4,5-TP or Silvex)	0.01
Phenols	0.001
Selenuim (total)	0.01
Sulphates	250
Total Dissolved Solids	500

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.305 Other Contaminants

Other contaminants which will not be adequately reduced by the treatment processes noted in 35 Ill. Adm. CodeSectionCode 302.303 mustshallmust not be present in concentrations hazardous to human health.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.306 Fecal Coliform

Notwithstanding the provisions of 35 Ill. Adm. CodeSectionCode 302.209, at no time shall the geometric mean, based on a minimum of five samples taken over not more than a 30 day period, of fecal coliform (STORET number 31616) exceed 2000 per 100 ml.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.307 Radium 226 and 228

Radium 226 and 228 ~~(STORET number 11503)~~ combined concentration must not exceed 5 picocuries per liter (pCi/L) at any time.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

SUBPART D: CHICAGO AREA WATERWAY SYSTEM AND LOWER DES PLAINES RIVER WATER QUALITY STANDARDS AND INDIGENOUS AQUATIC LIFE STANDARDS

Section 302.401 Scope and Applicability

a) Subpart D contains the standards that must be met only by the South Fork of the South Branch of the Chicago River (Bubbly Creek). The Subpart B general use and Subpart C public and food processing water supply standards ~~of this Part~~ do not apply to Bubbly Creek.

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 35 Ill. Adm. Code 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~~~~Section~~Code 302.209 ~~of this Part~~. 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~~~~Section~~Code 302.209 ~~of this Part~~.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.402 Purpose

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The Chicago Area Waterway System and Lower Des Plaines River standards ~~shall~~ protect primary contact, incidental contact or non-contact recreational uses (except when 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. 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 301 and designated in 35 Ill. Adm. Code 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 this Subpart D. However, the Chicago River is required to meet the general use standard, including the water quality standard for fecal coliform bacteria applicable to protected waters in 35 Ill. Adm. ~~Code Section~~ Code 302.209 ~~of this Part~~.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.403 Unnatural Sludge

Waters subject to this subpart must ~~shall~~ be free from unnatural sludge or bottom deposits, floating debris, visible oil, odor, unnatural plant or algal growth, or unnatural color or turbidity.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.404 pH

pH must ~~shall~~ be within the range of 6.5 to 9.0 except for natural causes, except for the South Fork of the South Branch of the Chicago River (Bubbly Creek) for which pH must ~~shall~~ be within the range of 6.0 to 9.0 except for natural causes.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.405 Dissolved Oxygen

Dissolved oxygen concentrations must ~~shall~~ not be less than the applicable values in subsections (a), (b), (c), and (d).

a) For the South Fork of the South Branch of the Chicago River (Bubbly Creek), dissolved oxygen concentrations must ~~shall~~ not be less than 4.0 mg/L at any time.

b) For the Upper Dresden Island Pool Aquatic Life Use waters listed in 35 Ill. Adm. Code 303.230:

1) during the period of March through July:

A) 6.0 mg/L as a daily mean averaged over 7 days; and

B) 5.0 mg/L at any time; and

2) during the period of August through February:

A) 5.5 mg/L as a daily mean averaged over 30 days;

B) 4.0 mg/L as a daily minimum averaged over 7 days; and

C) 3.5 mg/L at any time.

c) For the Chicago Area Waterway System Aquatic Life Use A waters listed in 35 Ill. Adm. Code 303.235:

1) during the period of March through July, 5.0 mg/L at any time; and

2) during the period of August through February:

A) 4.0 mg/L as a daily minimum averaged over 7 days; and

B) 3.5 mg/L at any time.

d) For the Chicago Area Waterway System and Brandon Pool Aquatic Life Use B waters listed in 35 Ill. Adm. ~~CodeSection~~Code 303.240:

1) 4.0 mg/L as a daily minimum averaged over 7 days; and

2) 3.5 mg/L at any time.

e) Assessing attainment of dissolved oxygen mean and minimum values.

1) Daily mean is the arithmetic mean of dissolved oxygen concentrations in 24 consecutive hours.

2) Daily minimum is the minimum dissolved oxygen concentration in 24 consecutive hours.

3) The measurements of dissolved oxygen used to determine attainment or lack of attainment with any of the dissolved oxygen standards in this Section must assure daily minima and daily means that represent the true daily minima and daily means.

4) The dissolved oxygen concentrations used to determine a daily mean or daily minimum should not exceed the air-equilibrated concentration.

5) "Daily minimum averaged over 7 days" means the arithmetic mean of daily minimum dissolved oxygen concentrations in 7 consecutive 24-hour periods.

6) "Daily mean averaged over 7 days" means the arithmetic mean of daily mean dissolved oxygen concentrations in 7 consecutive 24-hour periods.

7) "Daily mean averaged over 30 days" means the arithmetic mean of daily mean dissolved oxygen concentrations in 30 consecutive 24-hour periods.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.407 Chemical Constituents

a) The acute standard (AS) for the chemical constituents listed in subsection (e) must ~~shall~~ not be exceeded at any time except as provided in subsection (d).

b) The chronic standard (CS) for the chemical constituents listed in subsection (e) must ~~shall~~ not be exceeded by the arithmetic average of at least four consecutive samples collected over any period of four days, except as provided in subsection (d). The 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. For the chemical constituents that have water quality based standards dependent upon hardness, the chronic water quality standard will be calculated according to subsection (e) using the hardness of the water body at the time the sample was collected. To calculate attainment status of chronic standards, the concentration of the chemical constituent in each sample is divided by the calculated water quality standard for the sample to determine a quotient. The water quality standard is attained if the mean of the sample quotients is less than or equal to one for the duration of the averaging period.

c) The human health standard (HHS) for the chemical constituents listed in subsection (f) must ~~shall~~ not be exceeded, on a 12-month rolling average based on at least eight samples, collected in a manner representative of the sampling period, except as provided in subsection (d).

d) In waters where mixing is allowed under ~~pursuant to~~ 35 Ill. Adm. ~~Code~~~~Section~~Code 302.102 ~~of this Part~~, the following apply:

1) The AS must ~~shall~~ not be exceeded in any waters except for those waters for which a zone of initial dilution (ZID) applies under ~~pursuant to~~ 35 Ill. Adm. ~~Code~~~~Section~~Code 302.102 ~~of this Part~~.

2) The CS must ~~shall~~ not be exceeded outside of waters in which mixing is allowed under ~~pursuant to~~ 35 Ill. Adm. ~~Code~~~~Section~~Code 302.102 ~~of this Part~~.

3) The HHS must ~~shall~~ not be exceeded outside of waters in which mixing is allowed under ~~pursuant to~~ 35 Ill. Adm. ~~Code~~~~Section~~Code 302.102 ~~of this Part.~~.

e) Numeric Water Quality Standards for the Protection of Aquatic Organisms

Constituent	AS (µg/L)	CS (µg/L)
Arsenic (trivalent, dissolved)	340 X 1.0*=340	150 X 1.0*=150
Benzene	4200	860

Cadmium (dissolved)	$e^{A+B\ln(H)}$ X {1.138672-[(~~lnH~~ln(H))(0.041838)]}*, where A=-2.918 and B=1.128	$e^{A+B\ln(H)}$ X {1.101672-[(ln(H))(0.041838)]}*, where A= -3.490 and B=0.7852
Chromium (hexavalent, total)	16	11
Chromium (trivalent, dissolved)	$e^{A+B\ln(H)}$ X 0.316*, where A=3.7256 and B=0.8190	$e^{A+B\ln(H)}$ X 0.860*, where A=0.6848 and B=0.8190
Copper (dissolved)	$e^{A+B\ln(H)}$ X 0.960*, where A=-1.645 and B=0.9422	$e^{A+B\ln(H)}$ X 0.960*~~.~~, where A=-1.646 and B=0.8545
Cyanide**	22	10
Ethylbenzene	150	14
Fluoride (total)	$e^{A+B\ln(H)}$, where A = 6.7319 and B = 0.5394	$e^{A+B\ln(H)}$, but ~~mustshall~~must not exceed 4.0 mg/L, where A = 6.0445 and B = 0.5394
Lead (dissolved)	$e^{A+B\ln(H)}$ X {1.46203-[(ln(H))(0.145712)]}*, where A=-1.301 and B=1.273	$e^{A+B\ln(H)}$ X {1.46203-[(ln(H))(0.145712)]}*, where A=-2.863 and B=1.273
Manganese (dissolved)	$e^{A+B\ln(H)}$ X 0.9812*, where A=4.9187 and B=0.7467	$e^{A+B\ln(H)}$ X 0.9812*, where A=4.0635 and B=0.7467
Mercury (dissolved)	1.4 X 0.85*=1.2	0.77 X 0.85*=0.65
Nickel (dissolved)	$e^{A+B\ln(H)}$ X 0.998*, where A=0.5173 and B=0.8460	$e^{A+B\ln(H)}$ X 0.997*, where A=-2.286 and B=0.8460
Toluene	2000	600
TRC	19	11
Xylene(s)	920	360

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Zinc (dissolved)	$e^{A+B\ln(H)}$ X 0.978*, where A=0.9035 and B=0.8473	$e^{A+B\ln(H)}$ X 0.986*, where A =-0.4456 and B=0.8473

where:

~~µg/L = microgram per liter,~~

~~H = Hardness concentration of receiving water in mg/L as $CaCO_3$,~~

~~e^x = base of natural logarithms raised to the x- power,~~

~~ln(H) = natural logarithm of Hardness in mg/L as $CaCO_3$milligrams per liter,~~

~~* = conversion factor multiplier for dissolved metals, and~~

~~** = standard to be evaluated using either of the following USEPA approved methods, incorporated by reference at 35 Ill. Adm. Code 301.106: Method OIA-1677, DW: Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry, January 2004, Document Number EPA-821-R-04-001 or Cyanide Amenable to Chlorination, Standard Methods 4500-CN-G (40 CFR 136.3).~~

µg/L	=	microgram per liter
H	=	Hardness concentration of receiving water in mg/L as $CaCO_3$
e^x	=	base of natural logarithms raised to the x-power
ln(H)	=	natural logarithm of Hardness in mg/L as $CaCO_3$
*	=	conversion factor multiplier for dissolved metals
**	=	standard to be evaluated using either of the following USEPA approved methods, incorporated by reference at 35 Ill. Adm. Code 301.106: Method OIA-1677, DW: Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry, January 2004, Document Number EPA-821-R-04-001 or Cyanide Amenable to Chlorination, Standard Methods 4500-CN-G (40 CFR 136.3)

f) Numeric Water Quality Standard for the Protection of Human Health

~~Constituent HHS in micrograms per liter (µg/L)~~
~~Benzene 310~~
~~Mercury (total) 0.012~~
~~Phenols 860,000~~

Constituent	HHS (µg/L)
Benzene	310
Mercury (total)	0.012
Phenols	860,000

where:

~~µg/L = microgram per liter.~~

µg/L = microgram per liter

g) Numeric Water Quality Standards for Other Chemical Constituents

1) Concentrations of the following chemical constituents must ~~shall~~ not be exceeded except in waters for which mixing is allowed under ~~pursuant to~~ 35 Ill. Adm. ~~Code~~~~Section~~Code 302.102 ~~of this Part~~.

Constituent	Unit	Standard
Iron (dissolved)	mg/L	1.0
Selenium (total)	mg/L	1.0
Silver (dissolved)	µg/L	$e^{A+\text{~~Bln~~}B\ \ln(H)}$ X 0.85*, where A=-6.52 and B=1.72
Sulfate (where H is ≥ 100 but ≤ 500 and C is ≥ 25 but ≤ 500)	mg/L	[1276.7+5.508(H)-1.457(C)] X 0.65
Sulfate (where H is ≥ 100 but ≤ 500 and C is ≥ 5 but < 25)	mg/L	[-57.478 + 5.79(H) + 54.163(C)] X 0.65
Sulfate (where H > 500 and C ≥	mg/L	2,000

5)		

where:

mg/L = milligram per liter,

µg/L = microgram per liter,

H = Hardness concentration of receiving water in mg/L as $CaCO_3$,

C = Chloride concentration of receiving water in mg/L,

exp[*] = base of natural logarithms raised to the x-power,

ln(H) = natural logarithm of Hardness in milligrams per liter, and

* = conversion factor multiplier for dissolved metals

2) From July 1, 2015 until July 1, 2018, the following concentrations for Chloride and Total Dissolved Solids must shall not be exceeded except in waters for which mixing is allowed under pursuant to 35 Ill. Adm. CodeSection 302.102 of this Part.

Constituent	Unit	Standard
Chloride during the period of May 1 through November 30	mg/L	500
Total Dissolved Solids during the period of December 1 through April 30	mg/L	1,500

3)

mg/L	=	milligram per liter
µg/L	=	microgram per liter
H	=	Hardness concentration of receiving water in mg/L as

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		$CaCO_3$
C	=	Chloride concentration of receiving water in mg/L
e^x	=	base of natural logarithms raised to the x-power
ln(H)	=	natural logarithm of Hardness in milligrams per liter
*	=	conversion factor multiplier for dissolved metals

2)		

Beginning July 1, 2018, the ~~Chloride and Total Dissolved Solids standards in subsection (g)(2) of this Section are repealed and the~~ following concentration for Chloride must ~~shall~~ not be exceeded except in waters for which mixing is allowed under ~~pursuant to~~ 35 Ill. Adm. ~~Code~~Section Code 302.102 ~~of this Part~~:

Constituent	Unit	Standard
Chloride	mg/L	500

where:

~~mg/L = milligram per liter~~

mg/L	=	milligram per liter

h) Concentrations of other chemical constituents in the South Fork of the South Branch of the Chicago River (Bubbly Creek) must ~~shall~~ not exceed the following standards:

CONSTITUENT	~~STORET NUMBER~~	CONCENTRATION (mg/L)

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Ammonia Un-ionized (as N*)	~~00612~~	0.1
Arsenic (total)	~~01002~~	1.0
Barium (total)	~~01007~~	5.0
Cadmium (total)	~~01027~~	0.15
Chromium (total hexavalent)	~~01032~~	0.3
Chromium (total trivalent)	~~01033~~	1.0
Copper (total)	~~01042~~	1.0
Cyanide (total)	~~00720~~	0.10
Fluoride (total)	~~00951~~	15.0
Iron (total)	~~01045~~	2.0
Iron (dissolved)	~~01046~~	0.5
Lead (total)	~~01051~~	0.1
Manganese (total)	~~01055~~	1.0
Mercury (total)	~~71900~~	0.0005
Nickel (total)	~~01067~~	1.0
Oil, fats and grease	~~00550, 00556 or 00560~~	15.0**
Phenols	~~32730~~	0.3
Selenium (total)	~~01147~~	1.0
Silver	~~01077~~	1.1
Zinc (total)	~~01092~~	1.0
Total Dissolved Solids	~~70300~~	1500

* For purposes of this Section, the concentration of un-ionized ammonia ~~mustshall~~must be computed according to the following equation:

~~U = N / [0.94412(1 + 10^x) + 0.0559]~~

$$U = \frac{N}{\left[0.94412\left(1+10^{x}\right)+0.0559\right.}$$

where:

~~X = 0.09018 + 2729.92 - pH - pH~~
~~(T + 273.16)~~

~~U = Concentration of un-ionized ammonia as N in mg/L~~
~~N = Concentration of ammonia nitrogen as N in mg/L~~
~~T = Temperature in degrees Celsius~~

$$X = 0.09018 + \frac{2729.92 - pH}{(T + 273.16)}$$

U = Concentration of un-ionized ammonia as N in mg/L
N = Concentration of ammonia nitrogen as N in mg/L
T = Temperature in degrees Celsius

** Oil ~~mustshall~~must be analytically separated into polar and non-polar components if the total concentration exceeds 15 mg/L. In no case shall either of the components exceed 15 mg/L (i.e., 15 mg/L polar materials and 15 mg/L non-polar materials).

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.408 Temperature

a) For the South Fork of the South Branch of the Chicago River (Bubbly Creek), temperature ~~(STORET number (°F) 00011 and (°C) 00010) mustshall~~must not exceed 34 ºC (93 ºF)~~34° C(93° F)~~ more than 5% of the time, or 37.8 ºC ~~(100 ºF)37.8° C~~ (100~~° F~~ ºF) at any time.

b) The temperature standards in subsections (c) through (i) will become applicable beginning July 1, 2018. Starting July 1, 2015, the waters designated at 35 Ill. Adm. Code 303 as Chicago Area Waterway System Aquatic Life Use A, Chicago Area Waterway System and Brandon Pool Aquatic Life Use B, and Upper Dresden Island Pool Aquatic Life Use ~~mustwill~~must not exceed temperature ~~(STORET number (°F) 00011 and (°C) 00010)~~ of 34 ~~ºC~~°C (93 ~~ºF)34°C (93°F~~°F) more than 5% of the time, or 37.8 ~~ºC (100 ºF)37.8°~~ °C (100° °F) at any time.

c) There must not ~~shall~~ be ~~no~~ abnormal temperature changes that may adversely affect aquatic life unless caused by natural conditions.

d) The normal daily and seasonal temperature fluctuations that existed before the addition of heat due to other than natural causes ~~mustshall~~must be maintained.

e) The maximum temperature rise above natural temperatures must never ~~shall not~~ exceed 2.8 ~~ºC (5 ºF)~~2.8~~º~~ °C (5~~º~~ °F).

f) Water temperature at representative locations in the main river must never ~~shall not~~ exceed the maximum limits in the applicable table in subsections (g), (h) and (i), during more than one percent of the hours in the 12-month period ending with any month. ~~Moreover, at no time shall the~~ The water temperature must not exceed the maximum limits in the applicable table that follows by more than 1.7 ~~ºC (3.0 ºF).~~1.7~~º~~ °C (3.0~~º~~ °F).

g) Water temperature in the Chicago Area Waterway System Aquatic Life Use A waters listed in 35 Ill. Adm. Code 303.235 ~~mustshall~~must not exceed the limits in the following table in ~~complainceaccordance~~compliance with subsection (f):

~~Months Daily Maximum~~
~~(º C) (º F)(ºF)~~

~~January 16 60~~
~~February 16 60~~
~~March 16 60~~
~~April 32 90~~
~~May 32 90~~
~~June 32 90~~
~~July 32 90~~
~~August 32 90~~
~~September 32 90~~
~~October 32 90~~
~~November 32 90~~
~~December 16 60~~

Months	Daily Maximum	
	(° C)	(º F)
January	16	60
February	16	60
March	16	60

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April	32	90
May	32	90
June	32	90
July	32	90
August	32	90
September	32	90
October	32	90
November	32	90
December	16	60

h) Water temperature in the Chicago Area Waterway System and Brandon Pool Aquatic Life Use B waters listed in 35 Ill. Adm. Code 303.240~~, mustshall~~ must not exceed the limits in the following table in ~~complianceaccordance~~compliance with subsection (f):

~~Months Daily Maximum~~
~~(º C) (º F)(ºF)~~

~~January 16 60~~
~~February 16 60~~
~~March 16 60~~
~~April 32 90~~
~~May 32 90~~
~~June 32 90~~
~~July 32 90~~
~~August 32 90~~
~~September 32 90~~
~~October 32 90~~
~~November 32 90~~
~~December 16 60~~

Months	Daily Maximum	
	(° C)	(º F)
January	16	60
February	16	60
March	16	60

April	32	90
May	32	90
June	32	90
July	32	90
August	32	90
September	32	90
October	32	90
November	32	90
December	16	60

i) Water temperature for the Upper Dresden Island Pool Aquatic Life Use waters, as defined in 35 Ill. Adm. Code 303.230, ~~mustshall~~must not exceed the limits in the following table in ~~complianceaccordance~~compliance with subsection (f):

~~Months Daily Maximum~~
~~(º C) (º F)(ºF)~~

~~January 16 60~~
~~February 16 60~~
~~March 16 60~~
~~April 32 90~~
~~May 32 90~~
~~June 32 90~~
~~July 32 90~~
~~August 32 90~~
~~September 32 90~~
~~October 32 90~~
~~November 32 90~~
~~December 16 60~~

Months	Daily Maximum	
	(° C)	(º F)
January	16	60
February	16	60
March	16	60
April	32	90

~~POLLUTION CONTROL BOARD~~

~~NOTICE OF PROPOSED AMENDMENTS~~

May	32	90
June	32	90
July	32	90
August	32	90
September	32	90
October	32	90
November	32	90
December	16	60

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.409 Cyanide for the South Fork of the South Branch of the Chicago River (Bubbly Creek)

Cyanide (total) must ~~shall~~ not exceed 0.10 mg/L in the South Fork of the South Branch of the Chicago River (Bubbly Creek).

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.410 Other Toxic Substances

Any substance or combination of substances toxic to aquatic life not listed in Section 302.407 must ~~shall~~ not exceed one-half of the 96-hour median tolerance limit (96-hour TL_m) 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 35 Ill. Adm. Code 303 must ~~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.

a) Any substance or combination of substances will ~~shall~~ be deemed to be toxic or harmful to aquatic life if present in concentrations that exceed the following:

1) An Acute Aquatic Toxicity Criterion (AATC) validly derived and correctly applied ~~underpursuant to~~under procedures ~~set forth~~ in 35 Ill. Adm. ~~Code~~~~Sections~~Code 302.612 through 302.618 ~~of this Part~~ or in 35 Ill. Adm. ~~Code~~~~Section~~Code 302.621 ~~of this Part~~; or

2) A Chronic Aquatic Toxicity Criterion (CATC) validly derived and correctly applied ~~underpursuant to~~under procedures ~~set forth~~ in 35 Ill. Adm. Code ~~Section~~302.627 or 302.630 ~~of this Part~~.

b) Any substance or combination of substances will ~~shall~~ be deemed to be toxic or harmful to wild or domestic animal life if present in concentrations that exceed any Wild and Domestic Animal Protection Criterion (WDAPC) validly derived and correctly applied under ~~pursuant to~~ 35 Ill. Adm. ~~Code~~~~Section~~Code 302.633 ~~of this Part~~.

c) Any substance or combination of substances will ~~shall~~ be deemed to be toxic or harmful to human health if present in concentrations that exceed criteria, validly derived and correctly applied, based on either of the following:

1) Disease or functional impairment due to a physiological mechanism for which there is a threshold dose below which no damage occurs calculated under ~~pursuant to~~ 35 Ill. Adm. ~~Code~~~~Sections~~Code 302.642 through 302.648 (Human Threshold Criterion) ~~of this Part~~; or

2) Disease or functional impairment due to a physiological mechanism for which any dose may cause some risk of damage calculated under ~~pursuant to~~ 35 Ill. Adm. ~~Code~~~~Sections~~Code 302.651 through 302.658 (Human Nonthreshold Criterion) ~~of this Part~~.

d) The most stringent criterion of subsections (a), (b) and (c) applies ~~shall apply~~ at all points outside of any waters within which, mixing is allowed under ~~pursuant to~~ 35 Ill. Adm. ~~Code~~~~Section~~Code 302.102 ~~of this Part~~. In addition, the AATC derived under ~~pursuant to~~ subsection (a)(1) applies ~~shall apply~~ in all waters except that it must ~~shall~~ not apply within a ZID that is prescribed in ~~compliance~~~~accordance~~compliance with 35 Ill. Adm. ~~Code~~~~Section~~Code 302.102 ~~of this Part~~.

e) The procedures of Subpart F set forth minimum data requirements, appropriate test protocols, and data assessment methods for establishing criteria under ~~pursuant to~~ subsections (a), (b) and (c). No other procedures may be used to establish such criteria unless approved by the Board in a rulemaking or adjusted standard proceeding under ~~pursuant to~~ Title VII of the Act. The validity and applicability of the Subpart F procedures may not be challenged in any proceeding

brought under ~~pursuant to~~ Title VIII or X of the Act, although the validity and correctness of application of the numeric criteria derived under ~~pursuant to~~ Subpart F may be challenged in the proceedings under ~~pursuant to~~ subsection (f).

f) Agency derived criteria may be challenged as follows:

1) A permittee may challenge the validity and correctness of application of a criterion derived by the Agency under ~~pursuant to~~ this Section only at the time the criterion is first applied in an NPDES permit under ~~pursuant to~~ 35 Ill. Adm. Code 309.152 or in an action under ~~pursuant to~~ Title VIII of the Act for violation of the toxicity water quality standard. Failure of a person to challenge the validity of a criterion at the time of its first application constitutes ~~shall constitute~~ a waiver of the challenge in any subsequent proceeding involving application of the criterion to that person.

2) Consistent with subsection (f)(1), if a criterion is included as, or is used to derive, a condition of an NPDES discharge permit, a permittee may challenge the criterion in a permit appeal under ~~pursuant to~~ Section 40 of the Act and 35 Ill. Adm. Code 309.181. In any such action, the Agency must ~~shall~~ include in the record all information upon which it has relied in developing and applying the criterion, whether that information was developed by the Agency or submitted by the Petitioner. The burden of proof is ~~shall be~~ on the ~~petitioner~~Petitioner to demonstrate that the criterion-based condition is not necessary to accomplish the purposes of subsection (f)(1) (see Section 40(a)(1) of the Act), but there is no presumption in favor of the general validity and correctness of the application of the criterion as reflected in the challenged condition.

3) Consistent with subsection (f)(1), in an action in which alleged violation of the toxicity water quality standard is based on alleged excursion of a criterion, the person bringing the action has ~~shall have~~ the burdens of going forward with proof and of persuasion regarding the general validity and correctness of application of the criterion.

g) Subsections (a) through (e) do not apply to USEPA registered pesticides approved for aquatic application and applied ~~underpursuant to~~under the following conditions:

1) Application must ~~shall~~ be made in strict ~~compliance~~~~accordance~~compliance with label directions;

2) Applicator must ~~shall~~ be properly certified under the provisions of the Federal Insecticide, Fungicide, and Rodenticide Act (7 ~~USC~~U.S.C. 135 et seq. (1972)); and

3) Applications of aquatic pesticides must ~~comply~~~~be in accordance~~comply with the laws, regulations and guidelines of all state and federal agencies authorized by law to regulate, use or supervise pesticide applications.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.412 Total Ammonia Nitrogen

a) This Section does not apply to the South Fork of the South Branch of the Chicago River (Bubbly Creek).

b) For the Chicago Area Waterway System and the Lower Des Plaines River described in 35 Ill. Adm. Code 303.204 and listed in 35 Ill. Adm. Code 303.220 through 303.240, total ammonia nitrogen must in no case exceed 15 mg/L.

c) The total ammonia nitrogen acute, chronic, and sub-chronic standards are determined in ~~compliance~~~~accordance~~compliance with the equations in subsections (c)(1) and (c)(2). Attainment of each standard must be determined in ~~compliance~~~~accordance~~compliance with subsections (d) and (e) in mg/L.

1) The acute standard (AS) is calculated using the following equation:

~~$AS = \frac{0.411}{1 + 10^{7.204 - pH}} + \frac{58.4}{1 + 10^{pH - 7.204}}$~~

$$AS = \frac{0.411}{1+10^{7.204-pH}} + \frac{58.4}{1+10^{pH-7.204}}$$

2) The chronic standard (CS) is calculated using the following equations:

A) During the Early Life Stage Present period, as defined in subsection (f):

i) When water temperature is less than or equal to 14.51 ºC:

$$CS = \left\{ \frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right\} (2.85)$$

ii) When water temperature is above 14.51 ºC:

$$CS = \left\{ \frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right\} \left(1.45 * 10^{0.028*(25-T)}\right)$$

where:

~~T = Water Temperature, degrees Celsius~~

T = Water Temperature, degrees Celsius

B) During the Early Life Stage Absent period, as defined in subsection (f) ~~of this Section~~:

i) When water temperature is less than or equal to 7 ºC:

$$CS = \left\{ \frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right\} \left(1.45 * 10^{0.504}\right)$$

ii) When water temperature is greater than 7 ºC:

$$CS = \left\{ \frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right\} \left(1.45 * 10^{0.028(25-T)}\right)$$

Where:

~~T = Water Temperature, degrees Celsius~~

T = Water Temperature, degrees Celsius

3) The sub-chronic standard is equal to 2.5 times the chronic standard.

d) Attainment of the Total Ammonia Nitrogen Water Quality Standards~~.~~

1) The acute standard for total ammonia nitrogen (in mg/L) must not be exceeded at any time except in those waters for which the Agency has approved a ZID under 35 Ill. Adm. ~~Code~~pursuant to SectionCode 302.102 ~~of this Part~~.

2) The 30-day average concentration of total ammonia nitrogen (in mg/L) must not exceed the chronic standard (CS) except in those waters in which mixing is allowed under 35 Ill. Adm. ~~Code~~pursuant to SectionCode 302.102~~ of this Part~~. Attainment of the chronic standard (CS) is determined in ~~compliance~~accordancecompliance with subsection (e)~~ of this Section~~ by averaging at least four samples collected at weekly intervals or at other sampling intervals that statistically represent a 30-day sampling period. The samples must be collected in a manner that assures a representative sampling period.

3) The 4-day average concentration of total ammonia nitrogen (in mg/L) must not exceed the sub-chronic standard~~ is~~ except in those waters in which mixing is allowed under 35 Ill. Adm. ~~Code~~pursuant to SectionCode 302.102~~ of this Part~~. Attainment of the sub-chronic standard is determined in ~~compliance~~accordancecompliance with subsection (e) by averaging daily sample results collected over a period of four consecutive days within the 30-day averaging period. The samples must be collected in a manner that assures a representative sampling period.

e) The water quality standard for each water body must be calculated based on the temperature and pH of the water body measured at the time of each ammonia sample. The concentration of total ammonia in each sample must be divided by the calculated water quality standard for the sample to determine a quotient. The water quality standard is attained if the mean of the sample quotients is less than or equal to one for the duration of the averaging period.

f) The Early Life Stage Present period occurs from March through October. All other periods are subject to the Early Life Stage Absent period, except that waters listed in 35 Ill. Adm. Code 303.240 are not subject to Early Life Stage Present ammonia limits at any time.

BOARD NOTE: Acute and chronic standard concentrations for total ammonia nitrogen (in mg/L) for different combinations of pH and temperature are shown in Appendix C.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

SUBPART E: LAKE MICHIGAN BASIN WATER QUALITY STANDARDS

Section 302.501 Scope, Applicability, and Definitions

a) Subpart E contains the Lake Michigan Basin water quality standards. These must be met in the waters of the Lake Michigan Basin as designated in 35 Ill. Adm. Code 303.443.

b) In addition to the definitions provided at 35 Ill. Adm. Code 301.200 through 301.444, and in place of conflicting definitions at 35 Ill. Adm. ~~CodeSection~~Code 302.100, the following terms have the meanings specified for the Lake Michigan Basin:

"~~"~~

"Acceptable daily exposure"~~"~~ or "~~"~~"ADE"~~"~~ means an estimate of the maximum daily dose of a substance that is not expected to result in adverse noncancer effects to the general human population, including sensitive subgroups.

"~~"~~Acceptable endpoints"~~"~~, for the purpose of deriving wildlife criteria ~~derivation~~, means acceptable subchronic and chronic endpoints that affect reproductive or developmental success, organismal viability or growth, or any other endpoint that is, or is directly related to, parameters that influence population dynamics.

"~~"~~Acute to chronic ratio"~~"~~ or "~~"~~ACR"~~"~~ is the standard measure of the acute toxicity of a material divided by an appropriate measure of the

chronic toxicity of the same material under comparable conditions.

"~~"~~Acute toxicity"~~"~~ means adverse effects that result from an exposure period that is a small portion of the life span of the organism.

"~~"~~Adverse effect"~~"~~ means any deleterious effect to organisms due to exposure to a substance. This includes effects that are or may become debilitating, harmful or toxic to the normal functions of the organism, but does not include non~~-~~-harmful effects such as tissue discoloration alone or the induction of enzymes involved in the metabolism of the substance.

"~~"~~Baseline BAF"~~"~~ for organic chemicals, means a BAF that is based on the concentration of freely dissolved chemical in the ambient water and takes into account the partitioning of the chemical within the organism; for inorganic chemicals, a BAF is based on the wet weight of the tissue.

"~~"~~Baseline BCF"~~"~~ for organic chemicals, means a BCF that is based on the concentration of freely dissolved chemical in the ambient water and takes into account the partitioning of the chemical within the organism; for inorganic chemicals, a BAF is based on the wet weight of the tissue.

"~~"~~Bioaccumulative chemical of concern"~~"~~ or "~~"~~BCC"~~"~~ is any chemical that has the potential to cause adverse effects and that, upon entering the surface waters, by itself or as its toxic transformation product, accumulates in aquatic organisms by a human health bioaccumulation factor greater than 1,000, after considering metabolism and other physiochemical properties that might enhance or inhibit bioaccumulation, in ~~compliance~~~~accordance~~compliance with the methodology in 35 Ill. Adm. ~~Code~~~~Section~~Code 302.570. In addition, the half life of the chemical in the water column, sediment or biota must be greater than eight weeks. BCCs include~~, but are not limited to,~~ the following substances:

Chlordane

4,4~~'~~'-DDD; p,p~~'~~'-DDD; 4,4~~'~~'-TDE; p,p~~'~~'-TDE

4,4~~'~~'-DDE; p,p~~'~~'-DDE

4,4'-DDT; p,p'-DDT

Dieldrin

Hexachlorobenzene

Hexachlorobutadiene; Hexachloro-1,3-butadiene

Hexachlorocyclohexanes; BHCs

alpha- Hexachlorocyclohexane; alpha-BHC

beta- Hexachlorocyclohexane; beta-BHC

delta- Hexachlorocyclohexane; delta-BHC

Lindane; gamma- Hexachlorocyclohexane; gamma-BHC

Mercury

Mirex

Octachlorostyrene

PCBs; polychlorinated biphenyls

Pentachlorobenzene

Photomirex

2,3,7,8-TCDD; Dioxin

1,2,3,4-Tetrachlorobenzene

1,2,4,5-Tetrachlorobenzene

Toxaphene

"~~"~~Bioaccumulation"~~"~~ is the net accumulation of a substance by an organism as a result of uptake from all environmental sources.

"~~"~~Bioaccumulation factor"~~"~~ or "~~"~~BAF"~~"~~ is the ratio (in L/kg) of a substance's concentration in the tissue of an aquatic organism to its concentration in the ambient water, in situations where both the organism and its food are exposed and the ratio does not change substantially over time.

"~~"~~Bioconcentration"~~"~~ means the net accumulation of a substance by an aquatic organism as a result of uptake directly from the ambient water through gill membranes or other external body surfaces.

"~~"~~Bioconcentration Factor"~~"~~ or "~~"~~BCF"~~"~~ is the ratio (in L/kg) of a substance~~'~~'s concentration in the tissue of an aquatic organism to its concentration in the ambient water, in situations where the organism is exposed through the water only and the ratio does not change substantially over time.

"~~"~~Biota-sediment accumulation factor"~~"~~ or "~~"~~BSAF"~~"~~ means the ratio (in kg of organic carbon/kg of lipid) of a substance~~'~~'s lipid-normalized concentration in the tissue of an aquatic organism to its organic carbon-normalized concentration in surface sediment, in situations where the ratio does not change substantially over time, both the organism and its food are exposed, and the surface sediment is representative of average surface sediment in the vicinity of the organism.

"~~"~~Carcinogen"~~"~~ means a substance that causes an increased incidence of benign or malignant neoplasms, or substantially decreases the time to develop neoplasms, in animals or humans. The classification of carcinogens is determined by the procedures in Section II.A of Appendix C to 40 CFR 132, ~~(1996)~~ incorporated by reference in 35 Ill. Adm. Code 301.106. ~~Section 302.510.~~

"~~"~~Chronic effect"~~"~~ means an adverse effect that is measured by assessing an acceptable endpoint, and results from continual exposure over several generations, or at least over a significant part of the test species' projected life span or life stage.

"~~"~~Chronic toxicity"~~"~~ means adverse effects that result from an exposure period that is a large portion of the life span of the organism.

"~~"~~Dissolved organic carbon"~~"~~ or "~~"~~DOC"~~"~~ means organic carbon that passes through a 1 ~~um~~µm pore size filter.

"~~"~~Dissolved metal"~~"~~ means the concentration of a metal that will pass through a 0.45 ~~um~~µm pore size filter.

"~~"~~Food chain"~~"~~ means the energy stored by plants is passed along through the ecosystem through trophic levels in a series of steps of eating and being eaten, also known as a food web.

"~~"~~Food chain multiplier"~~"~~ or "~~"~~FCM"~~"~~ means the ratio of a BAF to an appropriate BCF.

"~~"~~Linearized multi-stage model"~~"~~ means a mathematical model for cancer risk assessment. This model fits linear dose-response curves to low doses. It is consistent with a no-threshold model of carcinogenesis.

"~~"~~Lowest observed adverse effect level"~~"~~ or "~~"~~LOAEL"~~"~~ means the lowest tested dose or concentration of a substance that results in an observed adverse effect in exposed test organisms when all higher doses or concentrations result in the same or more severe effects.

"~~"~~No observed adverse effect level"~~"~~ or "~~"~~NOAEL"~~"~~ means the highest tested dose or concentration of a substance that results in no observed adverse effect in exposed test organisms where higher doses or concentrations result in an adverse effect.

"~~"~~Octanol water partition coefficient"~~"~~ or "~~"~~Kow"~~"~~ is the ratio of the

concentration of a substance in the n-octanol phase to its concentration in the aqueous phase in an equilibrated two-phase octanol water system. For log Kow, the log of the octanol water partition coefficient is a base 10 logarithm.

"~~"~~Open Waters of Lake Michigan"~~"~~ means all of the waters within Lake Michigan in Illinois jurisdiction lakeward from a line drawn across the mouth of tributaries to Lake Michigan, but not including waters enclosed by constructed breakwaters.

"~~"~~Particulate organic carbon"~~"~~ or "~~"~~POC"~~"~~ means organic carbon that is retained by a 1 ~~um~~µm pore size filter.

"~~"~~Relative source contribution"~~"~~ or "~~"~~RSC"~~"~~ means the percent of total exposure that can be attributed to surface water through water intake and fish consumption.

"~~"~~Resident or indigenous species"~~"~~ means species that currently live a substantial portion of their life cycle, or reproduce, in a given body of water, or that are native species whose historical range includes a given body of water.

"~~"~~Risk associated dose"~~"~~ or ~~"~~"RAD"~~"~~ means a dose of a known or presumed carcinogenic substance in mg/kg/day which, over a lifetime of exposure, is estimated to be associated with a plausible upper bound incremental cancer risk equal to one in 100,000.

"~~"~~Slope factor"~~"~~ or "~~"~~q_1*"~~"~~ is the incremental rate of cancer development calculated through use of a linearized multistage model or other appropriate model. It is expressed in mg/kg/day of exposure to the chemical in question.

"~~"~~Standard Methods" means "Standard Methods for the Examination of Water and Wastewater", available from the American Public Health Association.

"~~"~~Subchronic effect"~~"~~ means an adverse effect, measured by assessing an acceptable endpoint, resulting from continual exposure for a period of

time less than that deemed necessary for a chronic test.

"~~"~~Target species"~~"~~ is a species to be protected by the criterion.

"~~"~~Target species value"~~"~~ is the criterion value for the target species.

"~~"~~Test species"~~"~~ is a species that has test data available to derive a criterion.

"~~"~~Test dose"~~"~~ or "~~"~~TD"~~"~~ is a LOAEL or NOAEL for the test species.

"~~"~~Tier I criteria"~~"~~ are numeric values derived by use of the Tier I methodologies that either have been adopted as numeric criteria into a water quality standard or are used to implement narrative water quality criteria.

"~~"~~Tier II values"~~"~~ are numeric values derived by use of the Tier II methodologies that are used to implement narrative water quality criteria. They are applied as criteria, have the same effect, and subject to the same appeal rights as criteria.

"~~"~~Trophic level"~~"~~ means a functional classification of taxa within a community that is based on feeding relationships. For example, aquatic green plants and herbivores comprise the first and second trophic levels in a food chain.

"~~"~~Toxic unit acute"~~"~~ or "~~"~~~~TU~~$_a$ TU_a"~~"~~ is the reciprocal of the effluent concentration that causes 50 percent of the test organisms to die by the end of the acute exposure period, which is 48 hours for invertebrates and 96 hours for vertebrates.

"~~"~~Toxic unit chronic"~~"~~ or "~~"~~~~TU~~$_c$ TU_c"~~"~~ is the reciprocal of the effluent concentration that causes no observable effect on the test organisms by the end of the chronic exposure period, which is at least seven days for Ceriodaphnia, fathead minnow and rainbow trout.

"~~"~~Uncertainty factor"~~"~~ or "~~"~~UF"~~"~~ is one of several numeric factors used in

deriving criteria from experimental data to account for the quality or quantity of the available data.

"~~"~~USEPA"~~"~~ means United States Environmental Protection Agency.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.502 Dissolved Oxygen

Dissolved oxygen ~~(STORET number 00300)~~ must not be less than 90% of saturation, except due to natural causes, in the Open Waters of Lake Michigan as defined at 35 Ill. Adm. ~~Code~~Section Code 302.501. The other waters of the Lake Michigan Basin must not be less than 6.0 mg/L during at least 16 hours of any 24 hour period, nor less than 5.0 mg/L at any time.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.503 pH

pH ~~(STORET number 00400)~~ must be within the range of 7.0 to 9.0, except for natural causes, in the Open Waters of Lake Michigan as defined at 35 Ill. Adm. ~~Code~~Section Code 302.501. Other waters of the Basin must be within the range of 6.5 to 9.0, except for natural causes.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.504 Chemical Constituents

The following concentrations of chemical constituents must not be exceeded, except as provided in 35 Ill. Adm. ~~Code~~Sections Code 302.102 and 302.530:

a) The following standards must be met in all waters of the Lake Michigan Basin. Acute aquatic life standards (AS) must not be exceeded at any time except for those waters for which the Agency has approved a zone of initial dilution (ZID) under 35 Ill. Adm. ~~Code~~pursuant to Sections Code 302.102 and 302.530. Chronic aquatic life standards (CS) and human health standards (HHS) must not be exceeded outside of waters in which mixing is allowed under 35 Ill. Adm. ~~Code~~pursuant to Sections Code 302.102 and 302.530 by the arithmetic average of at least four consecutive samples collected over a period of at least four days. The samples used to demonstrate compliance with the CS or HHS must be collected in

a manner which assures an average representation of the sampling period.

Constituent	Unit	AS	CS	HHS
Arsenic (Trivalent, dissolved)	µg/L	340 × 1.0* = 340	~~340 × 1.0* = 148~~ 148 x 1.0* = 148	NA
Boron (total)	mg/L	40.1	7.6	NA
Cadmium (dissolved)	µg/L	~~exp[$A + B\ln(H)$]× {1.138672 − [(ln H)~~ exp[$A + B\ln(H)$]× {1.138672 − [(ln$H$)~~ (0.041838)]}* where A = -3.6867 and B = 1.128	~~exp[$A + B\ln(H)$]× {1.101672 − [(ln H)~~ exp[$A + B\ln(H)$]× {1.101672 − [(ln$H$)~~ (0.041838)]}* where A = -2.715 and B = 0.7852	NA
Chromium (Hexavalent, total)	µg/L	16	11	NA
Chromium (Trivalent, dissolved)	µg/L	~~exp[$A + B\ln(H)$]×~~ exp[$A + B\ln(H)$]× 0.316* where A = 3.7256 and B = 0.819	~~exp[$A + B\ln(H)$]×~~ exp[$A + B\ln(H)$]× 0.860* where A = 0.6848 and B = 0.819	NA
Copper (dissolved)	µg/L	~~exp[$A + B\ln(H)$]×~~ exp[$A + B\ln(H)$]× 0.960* where A = -1.700 and B = 0.9422	~~exp[$A + B\ln(H)$]×~~ exp[$A + B\ln(H)$]× 0.960* where A = -1.702 and B = 0.8545	NA
Cyanide**	µg/L	22	5.2	NA
Fluoride (total)	µg/L	~~exp[$A + B\ln(H)$]~~	~~exp[$A + B\ln(H)$]~~	NA

		exp[A + B ln(H)] where A = 6.7319 and B = 0.5394	exp[A + B ln(H)], but ~~mustshall~~must not exceed 4.0 mg/L where A = 6.0445 and B = 0.5394	
Lead (dissolved)	µg/L	exp[A + B ln(H)]× {1.46203 – [(ln H) exp[A + B ln(H)]× {1.46203 – [(ln H) (0.145712)]}* where A = -1.055 and B =1.273	exp[A + B ln(H)]× {1.46203 – [(ln H) exp[A + B ln(H)]× {1.46203 – [(ln H) (0.145712)]}* where A = -4.003 and B = 1.273	NA
Manganese (dissolved)	µg/L	exp[A + B ln(H)]× 0.9812* exp[A + B ln(H)]× 0.9812* where A = 4.9187 and B = 0.7467	exp[A + B ln(H)]× 0.9812* exp[A + B ln(H)]× 0.9812* where A = 4.0635 and B = 0.7467	NA
Nickel (dissolved)	µg/L	exp[A + B ln(H)]× exp[A + B ln(H)]× 0.998* where A = 2.255 and B = 0.846	exp[A + B ln(H)]× exp[A + B ln(H)]× 0.997* where A = 0.0584 and B = 0.846	NA
Selenium (dissolved)	µg/L	NA	5.0	NA
TRC	µg/L	19	11	NA
Zinc (dissolved)	µg/L	exp[A + B ln(H)]× exp[A + B ln(H)]×	exp[A + B ln(H)]× exp[A + B ln(H)]×	NA

		0.978* where A = 0.884 and B = 0.8473	0.986* where A = 0.884 and B = 0.8473	
Benzene	µg/L	3900	800	310
Chlorobenzene	mg/L	NA	NA	3.2
2.4-Dimethylphenol	mg/L	NA	NA	8.7
2,4-Dinitrophenol	mg/L	NA	NA	2.8
Endrin	µg/L	0.086	0.036	NA
Ethylbenzene	µg/L	150	14	NA
Hexachloroethane	µg/L	NA	NA	6.7
Methylene chloride	mg/L	NA	NA	2.6
Parathion	µg/L	0.065	0.013	NA
Pentachlorophenol	µg/L	$\exp B([pH]+A)$ where A = -4.869 and B = 1.005	$\exp B([pH]+A)$ where A = -5.134 and B = 1.005	NA
Toluene	µg/L	2000	610	51.0
Trichloroethylene	µg/L	NA	NA	370
Xylene(s)	µg/L	1200	490	NA

2290

where:

NA = Not Applied

exp[x] = base of natural logarithms raised to the x-power

ln(H) = natural logarithm of Hardness in mg/L as $CaCO_3$

* = conversion factor multiplier for dissolved metals

** = standard to be evaluated using either of the following USEPA approved methods, incorporated by reference at 35 Ill. Adm. Code 301.106~~ 302.510~~: Method OIA-1677, DW: Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry, January 2004, Document Number EPA-821-R-04-001 or Cyanide Amenable to Chlorination, Standard Methods 4500-CN-G (40 CFR 136.3).

b) The following water quality standards must not be exceeded at any time in any waters of the Lake Michigan Basin, unless a different standard is specified under subsection (c)~~ of this Section~~.

Constituent		Unit	Water Quality Standard
Barium (total)	01007	mg/L	5.0
Chloride (total)		mg/L	500
Iron (dissolved)		mg/L	1.0
Phenols		mg/L	0.1
Sulfate		mg/L	500
Total Dissolved Solids		mg/L	1000

c) In addition to the standards specified in subsections (a) and (b)~~ of this Section~~, the following standards must not be exceeded at any time in the Open Waters of Lake Michigan as defined in Section 302.501.

Constituent	Unit	Water Quality Standard
Arsenic (total)	µg/L	50.0

Boron (total)	mg/L	1.0
Barium (total)	mg/L	1.0
Chloride (total)	mg/L	12.0
Fluoride (total)	mg/L	1.4
Iron (dissolved)	mg/L	0.30
Lead (total)	µg/L	50.0
Manganese (total)	mg/L	0.15
Nitrate-Nitrogen	mg/L	10.0
Phosphorus	µg/L	7.0
Selenium (total)	µg/L	10.0
Sulfate	mg/L	24.0
Total Dissolved Solids	mg/L	180.0
Oil (hexane solubles or equivalent)	mg/L	0.10
Phenols	µg/L	1.0

d) In addition to the standards specified in subsections (a), (b) and (c) ~~of this Section~~, the following human health standards (HHS) must not be exceeded in the Open Waters of Lake Michigan as defined in Section 302.501 by the arithmetic average of at least four consecutive samples collected over a period of at least four days. The samples used to demonstrate compliance with the HHS must be collected in a manner which assures an average representation of the sampling period.

Constituent	Unit	Water Quality Standard
Benzene	µg/L	12.0
Chlorobenzene	µg/L	470.0

2,4-Dimethylphenol	µg/L	450.0
2,4-Dinitrophenol	µg/L	55.0
Hexachloroethane (total)	µg/L	5.30
Lindane	µg/L	0.47
Methylene chloride	µg/L	47.0
Trichloroethylene	µg/L	29.0

e) For the following bioaccumulative chemicals of concern (BCCs), acute aquatic life standards (AS) must not be exceeded at any time in any waters of the Lake Michigan Basin and chronic aquatic life standards (CS), human health standards (HHS), and wildlife standards (WS) must not be exceeded in any waters of the Lake Michigan Basin by the arithmetic average of at least four consecutive samples collected over a period of at least four days subject to the limitations of 35 Ill. Adm. ~~CodeSections~~Code 302.520 and 302.530. The samples used to demonstrate compliance with the HHS and WS must be collected in a manner that assures an average representation of the sampling period.

Constituent	Unit	AS	CS	HHS	WS
Mercury (total)	ng/L	1,700	910	3.1	1.3
Chlordane	ng/L	NA	NA	0.25	NA
DDT and metabolites	pg/L	NA	NA	150	11.0
Dieldrin	ng/L	240	56	0.0065	NA
Hexachlorobenzene	ng/L	NA	NA	0.45	NA
Lindane	µg/L	0.95	NA	0.5	NA
PCBs (class)	pg/L	NA	NA	26	120
2,3,7,8-TCDD	fg/L	NA	NA	8.6	3.1
Toxaphene	pg/L	NA	NA	68	NA

where:

mg/L = milligrams per liter (10^{-3} grams per liter)

µg/L = micrograms per liter (10^{-6} grams per liter)

ng/L = nanograms per liter (10^{-9} grams per liter)

pg/L = picograms per liter (10^{-12} grams per liter)

fg/L = femtograms per liter (10^{-15} grams per liter)

NA = Not Applied

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.505 Fecal Coliform

Based on a minimum of five samples taken over not more than a 30-day period, fecal coliform ~~(STORET number 31616)~~ must not exceed a geometric mean of 20 per 100 ml in the Open Waters of Lake Michigan as defined in 35 Ill. Adm. ~~Code~~~~Section~~Code 302.501. The remaining waters of the Lake Michigan Basin must not exceed a geometric mean of 200 per 100 ml, nor shall more than 10% of the samples during any 30 day period exceed 400 per 100 ml.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.506 Temperature

~~a) STORET numbers for temperature are (°F) 00011 and (°C) 00010.~~

a~~)b~~) The owner or operator of a source of heated effluent ~~mustshall~~must maintain such records and conduct such studies of the effluents from ~~the~~~~such~~the source and ~~its~~~~of their~~its effects as may be required by the Agency or in any permit granted under the Act.

b~~)c~~) Backfitting of alternative cooling facilities will be required if, upon complaint filed in ~~compliance~~~~accordance~~compliance with Board rules, it is found at any time that any heated effluent causes significant ecological damage to the Lake.

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(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.507 Thermal Standards for Existing Sources on January 1, 1971

All sources of heated effluents in existence as of January 1, 1971, ~~mustshall~~must meet the following restrictions outside of a mixing zone which ~~mustshall~~must be no greater than a circle with a radius of 305 m (1000 feet) or an equal fixed area of simple form.

a) There must ~~shall~~ be no abnormal temperature changes that may affect aquatic life.

b) The normal daily and seasonal temperature fluctuations that existed before the addition of heat must ~~shall~~ be maintained.

c) The maximum temperature rise at any time above natural temperatures must ~~shall~~ not exceed 1.7 ºC (3 ºF)~~1.7°C (3° F~~). In addition, the water temperature must ~~shall~~ not exceed the maximum limits indicated in the following table:

~~| | ° C°C | ° F°F | | ° C°C | ° F°F |~~
~~| JAN. | 7 | 45 | JUL. | 27 | 80 |~~
~~| FEB. | 7 | 45 | AUG. | 27 | 80 |~~
~~| MAR. | 7 | 45 | SEPT. | 27 | 80 |~~
~~| APR. | 13 | 55 | OCT. | 18 | 65 |~~
~~| MAY | 16 | 60 | NOV. | 16 | 60 |~~
~~| JUN. | 21 | 70 | DEC. | 10 | 50 |~~

	° C	° F		° C	° F
JAN.	7	45	JUL.	27	80
FEB.	7	45	AUG.	27	80
MAR.	7	45	SEPT.	27	80
APR.	13	55	OCT.	18	65
MAY	16	60	NOV.	16	60
JUN.	21	70	DEC.	10	50

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.508 Thermal Standards for Sources Under Construction But Not In Operation on January 1, 1971

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Any effluent source under construction but not in operation on January 1, 1971 must meet all the requirements of 35 Ill. Adm. ~~Code~~~~Section~~Code 302.507 and in addition must meet the following restrictions:

a) The ~~Neither the~~ bottom, the shore, the hypolimnion, and ~~nor~~ the thermocline must not ~~shall~~ be affected by any heated effluent.

b) Heated ~~No heated~~ effluent must not ~~shall~~ affect spawning grounds or fish migration routes.

c) Discharge structures must ~~shall~~ be ~~so~~ designed ~~as~~ to maximize short-term mixing and thus to reduce the area significantly raised in temperature.

d) Discharge ~~No discharge~~ must not ~~shall~~ exceed ambient temperatures by more than 11 ºC (20 ºF)~~11°C (20°F)~~.

e) Heated effluents from more than one source must ~~shall~~ not interact.

f) All reasonable steps must ~~shall~~ be taken to reduce the number of organisms drawn into or against the intakes.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.509 Other Sources

a) A ~~No~~ source of heated effluent which was not in operation or under construction as of January 1, 1971, must not ~~shall~~ discharge more than a daily average of 29 megawatts (0.1 billion British thermal units per hour).

b) Sources of heated effluents which discharge less than a daily average of 29 megawatts (0.1 billion British ~~Thermal Units~~thermal units per hour) not in operation or under construction as of January 1, 1971, must ~~shall~~ meet all requirements of 35 Ill. Adm. ~~Code~~~~sections~~Code 302.507 and 302.508.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.510 Incorporations by Reference (Repealed)

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~~a) The Board incorporates the following publications by reference:~~

~~American Public Health Association et al., Standard Methods for the Examination of Water and Wastewater, 21st Edition, 2005. Available from the American Public Health Association, 800 I Street, NW, Washington, D.C. 20001-3710, (202)777-2742.~~

~~USEPA. United States Environmental Protection Agency, Office of Health and Environmental Assessment, Washington, D.C. 20460, Method OIA-1677, DW: Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry, January 2004, Document Number EPA-821-R-04-001.~~

~~b) The Board incorporates the following federal regulations by reference. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, (202) 783-3238:~~

~~40 CFR 136 (1996)~~

~~40 CFR 141 (1988)~~

~~40 CFR 302.4 (1988)~~

~~The Sections of 40 CFR 132 (1996) listed below:~~

~~Appendix A~~

~~Section I A~~

~~Section II~~

~~Section III C~~

~~Section IV D, E, F, G, H, and I~~

~~Section V C~~

~~Section VI A, B, C, D, E, and F~~

~~Section VIII~~

~~Section XI~~

~~Section XVII~~

~~Appendix B~~

~~Section III~~

~~Section VII B and C~~

~~Section VIII~~

~~Appendix C~~

~~Section II~~

~~Section III A (1 through 6 and 8), B (1 and 2)~~

~~Appendix D~~

~~Section III C, D, and E~~

~~Section IV~~

~~c) This Section incorporates no future editions or amendments.~~

(Source: Repealed at 46 Ill. Reg. _____, effective _____)

Section 302.515 Offensive Conditions

Waters of the Lake Michigan Basin must be free from sludge or bottom deposits, floating debris, visible oil, odor, plant or algal growth, color or turbidity of other than natural origin. The allowed mixing provisions of 35 Ill. Adm. ~~Code~~~~Section~~Code 302.102 must ~~shall~~ not be used to comply with the provisions of this Section.

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(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.520 Regulation and Designation of Bioaccumulative Chemicals of Concern (BCCs)

a) For ~~the purposes of~~ regulating BCCs in ~~compliance~~accordance~~compliance~~ with 35 Ill. Adm. ~~Code~~Sections~~Code~~ 302.521 and 302.530 ~~of this Part~~, the following chemicals must ~~shall~~ be considered as BCCs:

1) any chemical or class of chemicals listed as a BCC in 35 Ill. Adm. ~~Code~~Section~~Code~~ 302.501; and

2) any chemical or class of chemicals that the Agency has determined meets the characteristics of a BCC as defined in 35 Ill. Adm. ~~Code~~Section~~Code~~ 302.501 as indicated by:

A) publication in the Illinois Register; or

B) notification to a permittee or applicant; or

C) filing a petition with the Board to verify that the chemical must ~~shall~~ be designated a BCC.

b) Notwithstanding subsections (a)(2)(A) and (B) ~~of this Section~~, a chemical must ~~shall~~ not be regulated as a BCC if the Agency has not filed a petition, within 60 days after such publication or notification, with the Board in ~~compliance~~accordance~~compliance~~ with Section 28.2 of the Act to verify that the chemical must ~~shall~~ be designated a BCC.

c) Under ~~Pursuant to~~ subsection (b) ~~of this Section~~ and 35 Ill. Adm. ~~Code~~Section~~Code~~ 302.570 ~~of this Part~~, if the Board verifies that a chemical has a human health bioaccumulation factor greater than 1,000 and is consistent with the definition of a BCC in 35 Ill. Adm. Code 302.501~~Section 302.105~~, the Board must ~~shall~~ designate the chemical as a BCC and list the chemical in 35 Ill. Adm. ~~Code~~Section~~Code~~ 302.501. If the Board fails to verify the chemical as a BCC in its final action on the verification petition, the chemical ~~mustshall~~must not be listed as a BCC and ~~mustshall~~must not be regulated as a BCC in ~~compliance~~accordance~~compliance~~ with 35 Ill. Adm. ~~Code~~Sections~~Code~~ 302.521

and 302.530~~ of this Part~~.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.521 Supplemental Antidegradation Provisions for BCCs

a) Notwithstanding the provisions of 35 Ill. Adm. ~~Code~~~~Section~~Code 302.105, waters within the Lake Michigan Basin must not be lowered in quality due to new or increased loading of substances defined as ~~bioaccumulative chemicals of concern (~~BCCs~~)~~ in 35 Ill. Adm. ~~Code~~~~Section~~Code 302.501 from any source or activity subject to the NPDES permitting, Section 401 water quality certification provisions of the Clean Water Act (P.L. 92-100, as amended), or joint permits from the Agency and the Illinois Department of Natural Resources under Section 39(n) of the Act [415 ILCS 5/39(n)] until and unless it can be affirmatively demonstrated that such change is necessary to accommodate important economic or social development.

1) Where ambient concentrations of a BCC are equal to or exceed an applicable water quality criterion, no increase in loading of that BCC is allowed.

2) Where ambient concentrations of a BCC are below the applicable water quality criterion, a demonstration to justify increased loading of that BCC must include the following:

A) Pollution Prevention Alternatives Analysis. Identify any cost-effective reasonably available pollution prevention alternatives and techniques that would eliminate or significantly reduce the extent of increased loading of the BCC.

B) Alternative or Enhanced Treatment Analysis. Identify alternative or enhanced treatment techniques that are cost effective and reasonably available to the entity that would eliminate or significantly reduce the extent of increased loading of the BCC.

C) Important Social or Economic Development Analysis. Identify the social or economic development and the benefits that would be forgone if the increased loading of the BCC is not allowed.

3) In no case ~~willshall~~will increased loading of BCCs result in ~~exceedingexceedence of~~exceeding applicable water quality criteria or concentrations exceeding the level of water quality necessary to protect existing uses.

4) Changes in loadings of any BCC within the existing capacity and processes of an existing NPDES authorized discharge, certified activity under ~~pursuant to~~ Section 401 of the Clean Water Act, or joint permits from the Agency and the Illinois Department of Natural Resources under Section 39(n) of the Act are not subject to the antidegradation review of subsection (a) ~~of this Section~~. These changes include ~~but are not limited to~~:

A) normal operational variability, including~~, but not limited to,~~ intermittent increased discharges due to wet weather conditions;

B) changes in intake water pollutants;

C) increasing the production hours of the facility; or

D) increasing the rate of production.

5) Any determination to allow increased loading of a BCC based ~~onpursuant to~~on a demonstration of important economic or social development need ~~mustshall~~must satisfy the public participation requirements of 40 CFR 25 prior to final issuance of the NPDES permit, Section 401 water quality certification, or joint permits from the Agency and the Illinois Department of Natural Resources under Section 39(n) of the Act.

b) The following actions are not subject to the provisions of subsection (a) ~~of this Section~~, unless the Agency determines the circumstances of an individual situation warrant application of those provisions to adequately protect water quality:

1) Short-term, temporary (i.e., weeks or months) lowering of water quality;

2) Bypasses that are not prohibited at 40 CFR 122.41 (m), incorporated by

reference in 35 Ill. Adm. Code 301.106; or

3) Response actions ~~underpursuant to~~under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, or similar federal or State authority, undertaken to alleviate a release into the environment of hazardous substances, pollutants or contaminants that pose danger to public health or welfare.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.525 Radioactivity

Except as provided in 35 Ill. Adm. ~~Code~~~~Section~~Code 302.102, all waters of the Lake Michigan Basin must meet the following concentrations:

a) Gross beta ~~(STORET number 03501)~~ concentrations must not exceed 100 picocuries per liter (pCi/L).

~~b)~~ b) Strontium 90 ~~(STORET number 13501)~~ concentration must ~~shall~~ not exceed 2 picocuries per liter (pCi/L).

c) The annual average radium 226 and 228 ~~(STORET number 11503)~~ combined concentration must not exceed 3.75 picocuries per liter (pCi/L).

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.530 Supplemental Mixing Provisions for Bioaccumulative Chemicals of Concern (BCCs)

The Allowed Mixing, Mixing Zones, and ZIDs ~~provisions~~~~General Provisions~~provisions of 35 Ill. Adm. ~~Code~~~~Section~~Code 302.102 ~~(Allowed Mixing, Mixing Zones and ZIDs)~~ apply within the Lake Michigan Basin except as otherwise provided ~~herein~~ for substances defined as BCCs in 35 Ill. Adm. ~~Code~~~~Section~~Code 302.501:

a) Mixing is ~~not~~~~No mixing shall be~~not allowed for BCCs for new discharges commencing on or after December 24, 1997.

b) Discharges of BCCs existing as of December 24, 1997 are eligible for mixing

allowance consistent with 35 Ill. Adm. ~~Code~~~~Section~~Code 302.102 until March 23, 2007. After March 23, 2007 mixing for BCCs will not be allowed except as provided in subsections (c) and (d)~~ of this Section~~.

c) Mixing allowance for a source in existence on December 24, 1997 may continue beyond March 23, 2007 where it can be demonstrated on a case by case basis that continuation of mixing allowance is necessary to achieve water conservation measures that result in overall reduction of BCC mass loading to the Lake Michigan Basin.

d) Mixing allowance for a source in existence on December 24, 1997 ~~will~~~~shall~~will only continue if necessitated by technical and economic factors. Any mixing allowance continued beyond March 23, 2007 based on technical and economic factors ~~must~~~~shall~~must be limited to not more than one NPDES permit term, and ~~must~~~~shall~~must reflect the maximum achievable BCC loading reduction within the identified technical and economic considerations necessitating the exception. ~~The~~~~Such~~The continued mixing allowance ~~must~~~~shall~~must not be renewed beyond that permit term unless a new determination of technical and economic necessity is made.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.535 Ammonia Nitrogen

The Open Waters of Lake Michigan as defined in 35 Ill. Adm. ~~Code~~~~Section~~Code 302.501 must not exceed 0.02 mg/L total ammonia~~ (as N: STORET Number 00610)~~. The remaining waters of the Lake Michigan Basin ~~are~~~~shall be~~are subject to the following:

a) Total ammonia nitrogen~~ (as N: STORET Number 00610)~~ must in no case exceed 15 mg/L.

b) Un-ionized ammonia nitrogen~~ (as N: STORET Number 00612)~~ must not exceed the acute and chronic standards given below subject to the provisions of 35 Ill. Adm. ~~Code~~~~Sections~~Code 302.208(a) and (b)~~ of this Part~~:

1) From April through October, the Acute Standard (AS) must~~ shall~~ be 0.33 mg/L and the chronic standard (CS) must ~~shall~~ be 0.057 mg/L.

2) From November through March, the AS ~~mustshall~~must be 0.14 mg/L and the CS ~~mustshall~~must be 0.025 mg/L.

c) For ~~purposes of~~ this Section, the concentration of un-ionized ammonia nitrogen as N and total ammonia as N must ~~shall~~ be computed according to the following equations:

~~U= N~~
~~[0.94412(1 + 10^x) + 0.0559]~~

$$U = \frac{N}{[0.94412(1 + 10^{x}) + 0.0559]}$$

and $N = U[0.94412(1 + 10^{x}) + 0.0559]$

Where: ~~X = 0.09018 + 2729.92 - pH~~
~~(T + 273.16)~~

~~U = Concentration of un-ionized ammonia as N in mg/L~~
~~N = Concentration of ammonia nitrogen as N in mg/L~~
~~T = Temperature in degrees Celsius.~~

$$X = 0.09018 + \frac{2729.92}{(T + 273.16)} - pH$$

U = Concentration of un-ionized ammonia as N in mg/L

N = Concentration of ammonia nitrogen as N in mg/L

T = Temperature in degrees Celsius.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.540 Other Toxic Substances

Waters of the Lake Michigan Basin must be free from any substance or any combination of substances in concentrations toxic or harmful to human health, or to animal, plant or aquatic life. The numeric standards protective of particular uses specified for individual chemical substances

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in 35 Ill. Adm. CodeSectionCode 302.504 are not subject to recalculation by this Section, however, where no standard applies tois applied forto a category, a numeric value may be calculated herein.

a) Any substance willshallwill be deemed toxic or harmful to aquatic life if present in concentrations that exceed the following:

1) A Tier I Lake Michigan Basin Acute Aquatic Life Toxicity Criterion (LMAATC) or Tier II Lake Michigan Basin Acute Aquatic Life Toxicity Value (LMAATV) derived underpursuant tounder procedures set forth in 35 Ill. Adm. CodeSectionsCode 302.555, 302.560 or 302.563 at any time; or

2) A Tier I Lake Michigan Basin Chronic Aquatic Life Toxicity Criterion (LMCATC) or Tier II Lake Michigan Basin Chronic Aquatic Life Toxicity Value (LMCATV) derived underpursuant tounder procedures set forth in 35 Ill. Adm. CodeSectionCode 302.565 as an average of four samples collected on four different days.

b) Any combination of substances, including effluents, willshallwill be deemed toxic to aquatic life if present in concentrations that exceed either subsection (b)(1) or (2) of this Section:

1) A No sample of water from the Lake Michigan Basin collected outside of a designated zone of initial dilution must not shall exceed 0.3 TU_a as determined for the most sensitive species tested using acute toxicity testing methods.

2) A No sample of water from the Lake Michigan Basin collected outside a designated mixing zone must not shall exceed 1.0 TU_c as determined for the most sensitive species tested using chronic toxicity testing methods.

3) To demonstrate compliance with subsections (1) and (2) of this subsection (b), at least two resident or indigenous species mustwillmust be tested. The rainbow trout mustwillmust be used to represent fishes for the Open Waters of Lake Michigan and the fathead minnow mustwillmust represent fishes for the other waters of the Lake Michigan Basin. Ceriodaphnia mustwillmust represent invertebrates for all waters of the Lake Michigan

Basin. Other common species ~~mayshall~~may be used if listed in Table I (a)~~A~~ of 40 CFR 136, incorporated by reference at 35 Ill. Adm. Code 301.106~~ Section 302.510~~, and approved by the Agency.

c) Any substance must~~ shall~~ be deemed toxic or harmful to wildlife if present in concentrations that exceed a Tier I Lake Michigan Basin Wildlife Criterion (LMWLC) derived ~~underpursuant to~~under procedures~~ set forth~~ in 35 Ill. Adm. ~~CodeSection~~Code 302.575 as an arithmetic average of four samples collected over four different days.

d) For any substance that is a threat to human health through drinking water exposure only, the resulting criterion or value must ~~applyshall be applicable~~apply to only the Open Waters of Lake Michigan. For any substance that is determined to be a BCC, the resulting criterion ~~mustshall~~must apply in the entire Lake Michigan Basin. These substances ~~mustshall~~must be deemed toxic or harmful to human health if present in concentrations that exceed either of the following:

1) A Tier I Lake Michigan Basin Human Health Threshold Criterion (LMHHTC) or Tier II Lake Michigan Basin Human Health Threshold Value (LMHHTV) based on disease or functional impairment due to a physiological mechanism for which there is a threshold dose below which no damage occurs as derived ~~underpursuant to~~under procedures ~~set forth~~ in 35 Ill. Adm. ~~CodeSection~~Code 302.585 as an arithmetic average of four samples collected over four different days; or

2) A Tier I Lake Michigan Basin Human Health Nonthreshold Criterion (LMHHNC) or Tier II Lake Michigan Basin Human Health Nonthreshold Value (LMHHNV) based on disease or functional impairment due to a physiological mechanism for which any dose may cause some risk of damage as derived ~~underpursuant to~~under procedures ~~set forth~~ in 35 Ill. Adm. ~~CodeSection~~Code 302.590 as an arithmetic average of four samples collected over four different days.

e) The derived criteria and values apply at all points outside of any waters in which mixing is allowed under 35 Ill. Adm. ~~Codepursuant to Section~~Code 302.102 or ~~Section~~ 302.530.

f) The procedures of this Subpart E set forth minimum data requirements,

appropriate test protocols and data assessment methods for establishing criteria or values underpursuant tounder subsections (b), (c), and (d) of this Section. No other procedures may be used to establish such criteria or values unless approved by the Board in a rulemaking or adjusted standards proceeding underpursuant tounder Title VII of the Act. The validity and applicability of these procedures may not be challenged in any proceeding brought underpursuant tounder Title VIII or X of the Act, although the validity and correctness of application of the numeric criteria or values derived under pursuant to this Subpart may be challenged in such proceedings underpursuant tounder subsection (g) of this Section.

g) Challenges to application of criteria and values.

1) A permittee may challenge the validity and correctness of application of a criterion or value derived by the Agency under pursuant to this Section only at the time such criterion or value is first applied in its NPDES permit under pursuant to 35 Ill. Adm. Code 309.152 or in an action underpursuant tounder Title VIII of the Act for violation of the toxicity water quality standard. Failure of a person to challenge the validity of a criterion or value at the time of its first application to that person's facility constitutes shall constitute a waiver of a such challenge in any subsequent proceeding involving application of the criterion or value to that person.

2) Consistent with subsection (g)(1) of this Section, if a criterion or value is included as, or is used to derive, a condition of an NPDES discharge permit, a permittee may challenge the criterion or value in a permit appeal underpursuant tounder 35 Ill. Adm. Code 309.181. In any such action, the Agency shall include in the record all information upon which it has relied in developing and applying the criterion or value, and whether such information was developed by the Agency or submitted by the petitioner. THE BURDEN OF PROOF SHALL BE ON THE PETITIONER pursuant to Section 40(a)(1) of the Act.

3) Consistent with subsection (g)(1) of this Section, in an action where alleged violation of the toxicity water quality standard is based on alleged excursion of a criterion or value, the person bringing the such action hasshall havehas the burdens of going forward with proof and persuasion regarding the general validity and correctness of application of the

criterion or value.

h) Subsections (a) through (e) ~~of this Section~~ do not apply to USEPA registered pesticides approved for aquatic application and applied under ~~pursuant to~~ the following conditions:

1) Application must ~~shall~~ be made in strict ~~compliance~~ ~~accordance~~ compliance with label directions;

2) Applicator must ~~shall~~ be properly certified under the provisions of the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 135 et seq. (1972));

3) Applications of aquatic pesticides must ~~comply~~ ~~be in accordance~~ comply with the laws, regulations and guidelines of all State and federal agencies authorized by law to regulate, use or supervise pesticide applications;

4) Aquatic ~~No aquatic~~ pesticide must not ~~shall~~ be applied to waters affecting public or food processing water supplies unless a permit to apply the pesticide has been obtained from the Agency. All permits must ~~shall~~ be issued so as not to cause a violation of the Act or of any of the Board's rules ~~or regulations~~. To aid applicators in determining their responsibilities under this subsection (h), a list of waters affecting public water supplies will be published and maintained by the Agency's Division of Public Water Supplies.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.545 Data Requirements

The Agency ~~must~~ ~~shall~~ must review, for validity, applicability and completeness the data used in calculating criteria or values. To the extent available, and to the extent not otherwise specified, testing procedures, selection of test species and other aspects of data acquisition must be according to methods published by USEPA or nationally recognized standards of organizations, including ~~, but not limited to,~~ those methods found in Standard Methods, incorporated by reference in 35 Ill. Adm. Code 301.106 ~~Section 302.510~~, or recommended in 40 CFR 132, ~~and~~ incorporated by reference in 35 Ill. Adm. Code 301.106 ~~Section 302.510~~.

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(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.550 Analytical Testing

All methods of sample collection, preservation, and analysis used in applying any of the requirements of this Subpart must ~~shall~~ be consistent with the methods published by USEPA or nationally recognized standards of organizations, including ~~but not limited to~~ those methods found in Standard Methods, incorporated by reference in 35 Ill. Adm. Code 301.106 ~~Section 302.510~~, or recommended in 40 CFR 132 and incorporated by reference in 35 Ill. Adm. Code 301.106 ~~Section 302.510~~.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.553 Determining the Lake Michigan Aquatic Toxicity Criteria or Values ~~-~~ General Procedures

The Lake Michigan Aquatic Life Criteria and Values are those concentrations or levels of a substance at which aquatic life is protected from adverse effects resulting from short or long term exposure in water.

a) Tier I criteria and Tier II values to protect against acute effects in aquatic organisms will be calculated according to procedures listed at 35 Ill. Adm. ~~Code Sections~~Code 302.555, 302.560 and 302.563. The procedures of 35 Ill. Adm. ~~Code Section~~Code 302.560 ~~mustshall~~must be used as necessary to allow for interactions with other water quality characteristics such as hardness, pH, temperature, etc. Tier I criteria and Tier II values to protect against chronic effects in aquatic organisms ~~mustshall~~must be calculated according to the procedures listed at 35 Ill. Adm. ~~Code Section~~Code 302.565.

b) Minimum data requirements. In order to derive a Tier I acute or chronic criterion, data must be available for at least one species of freshwater animal in at least eight different families such that the following taxa are included:

1) The family Salmonidae in the class Osteichthyes;

2) One other family in the class Osteichthyes;

3) A third family in the phylum Chordata;

4) A planktonic crustacean;

5) A benthic crustacean;

6) An insect;

7) A family in a phylum other than Arthropoda or Chordata; and

8) A family from any order of insect or any phylum not already represented.

c) Data for tests with plants, if available, must be included in the data set.

d) If data for acute effects are not available for all the eight families listed above, but are available for the family Daphnidae, a Tier II value ~~mustshall~~must be derived according to procedures in 35 Ill. Adm. ~~CodeSection~~Code 302.563. If data for chronic effects are not available for all the eight families, but there are acute and chronic data available according to 35 Ill. Adm. ~~CodeSection~~Code 302.565(b) so that three acute to chronic ratios (ACRs) can be calculated, then a Tier I chronic criterion can be derived according to procedures in 35 Ill. Adm. ~~CodeSection~~Code 302.565. If three ACRs are not available, then a Tier II chronic value can be derived according to procedures in 35 Ill. Adm. ~~CodeSection~~Code 302.565(b).

e) Data must be obtained from species that have reproducing wild populations in North America except that data from salt water species can be used in the derivation of an ACR.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.555 Determining the Tier I Lake Michigan Acute Aquatic Toxicity Criterion (LMAATC): Independent of Water Chemistry

If the acute toxicity of the chemical has not been shown to be related to a water quality characteristic, including~~, but not limited to,~~ hardness, pH, or temperature, the Tier I LMAATC is calculated using the procedures below.

a) For each species for which more than one acute value is available, the Species Mean Acute Value (SMAV) is calculated as the geometric mean of the acute

values from all tests.

b) For each genus for which one or more SMAVs are available, the Genus Mean Acute Value (GMAV) is calculated as the geometric mean of the SMAVs available for the genus.

c) The GMAVs are ordered from high to low in numerical order.

d) Ranks (R) are assigned to the GMAVs from "1" for the lowest to "N" for the highest. If two or more GMAVs are identical, successive ranks are arbitrarily assigned.

e) The cumulative probability, P, is calculated for each GMAV as R/(N+1).

f) The GMAVs to be used in the calculations of subsection (g) ~~of this Section~~ must be those with cumulative probabilities closest to 0.05. If there are fewer than 59 GMAVs in the total data set, the values utilized must be the lowest four obtained through the ranking procedures of subsections (c) and (d) ~~of this Section~~.

g) Using the GMAVs identified under ~~pursuant to~~ subsection (f) ~~of this Section~~ and the Ps calculated under ~~pursuant to~~ subsection (e) ~~of this Section~~, the Final Acute Value (FAV) and the LMAATC are calculated as:

FAV = exp(A) and
LMAATC = FAV/2

Where:

~~A = L + 0.2236 S~~

~~L = [Σ(lnGMAV) - S(Σ($P^{0.5}$))]/4~~

~~S = [[Σ((lnGMAV)^2) - ((Σ(lnGMAV))^2)/4]/[Σ(P) - ((Σ($P^{0.5}$))^2)/4]]$^{0.5}$~~

A = L + 0.2236 S

L = [Σ(lnGMAV) – S(Σ(P(0.5)))]/4

S = [[Σ((lnGMAV)^2) - ((Σ(lnGMAV))^2)/4] / [Σ(P) - ((Σ($P^{0.5}$))^2)/4]]$^{0.5}$

h) If a resident or indigenous species, whose presence is necessary to sustain commercial or recreational activities, will not be protected by the calculated FAV, then the SMAV for that species is used as the FAV.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.560 Determining the Tier I Lake Michigan Basin Acute Aquatic Life Toxicity Criterion (LMAATC): Dependent on Water Chemistry

If data are available to show that a relationship exists between a water quality characteristic (WQC) and acute toxicity to two or more species, a Tier I LMAATC must be calculated using procedures in this Section. Although the relationship between hardness and acute toxicity is typically non-linear, it can be linearized by a logarithmic transformation (i.e., for any variable, K, f(K) = logarithm of K) of the variables and plotting the logarithm of hardness against the logarithm of acute toxicity. Similarly, relationships between acute toxicity and other water quality characteristics, such as pH or temperature, may require a transformation, including no transformation (i.e., for any variable, K, f(K) = K) for one or both variables to obtain least squares linear regression of the transformed acute toxicity values on the transformed values of the water quality characteristic. An LMAATC is calculated using the following procedures.

a) For each species for which acute toxicity values are available at two or more different values of the water quality characteristic, a linear least squares regression of the transformed acute toxicity (TAT) values on the transformed water quality characteristic (TWQC) values is performed to obtain the slope of the line describing the relationship.

b) Each of the slopes determined ~~underpursuant to~~under subsection (a) ~~of this Section~~ is evaluated as to whether it is statistically valid, ~~consideringtaking into account~~considering the range and number of tested values of the water quality characteristic and the degree of agreement within and between species. If slopes are not available for at least one fish and one invertebrate species, or if the available slopes are too dissimilar or if too few data are available to define the relationship between acute toxicity and the water quality characteristic, then the LMAATC must be calculated using the procedures in 35 Ill. Adm. ~~CodeSection~~Code 302.555.

c) Normalize the TAT values for each species by subtracting W, the arithmetic mean

of the TAT values of a species, from each of the TAT values used in the determination of the mean, such that the arithmetic mean of the normalized TAT values for each species individually or for any combination of species is zero (0.0).

d) Normalize the TWQC values for each species using X, the arithmetic mean of the TWQC values of a species, in the same manner as in subsection (c) of this Section.

e) Group all the normalized data by treating them as if they were from a single species and perform a least squares linear regression of all the normalized TAT values on the corresponding normalized TWQC values to obtain the pooled acute slope, V.

f) For each species, the graphical intercept representing the species TAT intercept, f(Y), at a specific selected value, Z, of the WQC is calculated using the equation:

$$f(Y) = W - V(X - g(Z))$$

Where:

f() is the transformation used to convert acute toxicity values to TAT values

Y is the species acute toxicity intercept or species acute intercept

W is the arithmetic mean of the TAT values as specified in subsection (c) of this Section

V is the pooled acute slope as specified in subsection (e) of this Section

X is the arithmetic mean of the TWQC values as specified in subsection (c) of this Section

g() is the transformation used to convert the WQC values to TWQC values

Z is a selected value of the WQC

f() is the transformation used to convert acute toxicity values to TAT

	values
Y	is the species acute toxicity intercept or species acute intercept
W	is the arithmetic mean of the TAT values as specified in subsection (c)
V	is the pooled acute slope as specified in subsection (e)
X	is the arithmetic mean of the TWQC values as specified in subsection (c)
g()	is the transformation used to convert the WQC values to TWQC values
Z	is a selected value of the WQC

g) For each species, determine the species acute intercept, Y, by carrying out an inverse transformation of the species TAT value, f(Y). For example, in the case of a logarithmic transformation, Y = antilogarithm of (f(Y)); or in the case where no transformation is used, Y = f(Y).

h) The Final Acute Intercept (FAI) is derived by using the species acute intercepts, obtained from subsection (f)~~ of this Section~~, in ~~compliance~~~~accordance~~compliance with the procedures described in 35 Ill. Adm. ~~Code~~~~Section~~Code 302.555 (b) through (g), with the word "value" replaced by the word "intercept". Note that in this procedure geometric means and natural logarithms are always used.

i) The Aquatic Acute Intercept (AAI) is obtained by dividing the FAI by two. If, for a commercially or recreationally important species, the geometric mean of the acute values at Z is lower than the FAV at Z, then the geometric mean of that species must be used as the FAV.

j) The LMAATC at any value of the WQC, denoted by WQCx, is calculated using the terms defined in subsection (f)~~ of this Section~~ and the equation:

$$LMAATC = \exp[V(g(WQCx) - g(Z)) + f(AAI)]$$

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.563 Determining the Tier II Lake Michigan Basin Acute Aquatic Life Toxicity Value (LMAATV)

If all eight minimum data requirements for calculating a FAV using Tier I procedures are not met, a Tier II LMAATV must be calculated for a substance as follows:

a) The lowest GMAV in the database is divided by the Secondary Acute Factor (SAF) corresponding to the number of satisfied minimum data requirements listed in the Tier I methodology (35 Ill. Adm. CodeSectionCode 302.553). In order to calculate a Tier II LMAATV, the data base must contain, at a minimum, a GMAV for one of the following three genera in the family Daphnidae – *Ceriodaphnia* sp., *Daphnia* sp., or *Simocephalus* sp. The Secondary Acute Factors are:

Number of Minimum data requirements satisfied (required taxa)	Secondary Acute Factor
1	43.8
2	26.0
3	16.0
4	14.0
5	12.2
6	10.4
7	8.6

b) If dependent on a water quality characteristic, the Tier II LMAATV must be calculated according to 35 Ill. Adm. CodeSectionCode 302.560.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.565 Determining the Lake Michigan Basin Chronic Aquatic Life Toxicity Criterion (LMCATC) or the Lake Michigan Basin Chronic Aquatic Life Toxicity Value (LMCATV)

a) Determining Tier I LMCATC

1) When chronic toxicity data are available for at least eight resident or indigenous species from eight different North American genera of freshwater organisms as specified in 35 Ill. Adm. ~~Code~~~~Section~~Code 302.553, a Tier I LMCATC is derived in the same manner as the FAV in 35 Ill. Adm. ~~Code~~~~Section~~Code 302.555 or 302.560 by substituting LMCATC for FAV or FAI, chronic for acute, SMCV (Species Mean Chronic Value) for SMAV, and GMCV (Genus Mean Chronic Value) for GMAV.

2) If data are not available to meet the requirements of subsection (a) ~~of this Section~~, a Tier I LMCATC is calculated by dividing the FAV by the geometric mean of the acute-chronic ratios (ACRs) obtained from at least one species of aquatic animal from at least three different families provided that of the three species:

A) At least one is a fish;

B) At least one is an invertebrate; and

C) At least one species is an acutely sensitive freshwater species if the other two are saltwater species.

3) The acute-chronic ratio (ACR) for a species equals the acute toxicity concentration from data considered under 35 Ill. Adm. ~~Code~~~~Section~~Code 302.555 or 302.560, divided by the chronic toxicity concentration.

4) If a resident or indigenous species whose presence is necessary to sustain commercial or recreational activities will not be protected by the calculated LMCATC, then the SMCV for that species is used as the CATC.

b) Determining the Tier II LMCATV

1) If all eight minimum data requirements for calculating a FCV using Tier I procedures are not met, or if there are not enough data for all three ACRs, a Tier II Lake Michigan Chronic Aquatic Life Toxicity Value

~~must~~~~shall~~must be calculated using a secondary acute chronic ratio (SACR) determined as follows:

A) If fewer than three valid experimentally determined ACRs are available:

i) Use sufficient ACRs of 18 so that the total number of ACRs equals three; and

ii) Calculate the Secondary Acute-Chronic Ratio as the geometric mean of the three ACRs; or

B) If no experimentally determined ACRs are available, the SACR is 18.

2) Calculate the Tier II LMCATV using one of the following equations:

A) Tier II LMCATV = FAV / SACR

B) Tier II LMCATV = SAV / FACR

C) Tier II LMCATV = SAV / SACR

Where:

the SAV equals 2 times the value of the Tier II LMAATV calculated in 35 Ill. Adm. ~~Code~~~~Section~~Code 302.563

3) If, for a commercially or recreationally important species, the SMCV is lower than the calculated Tier II LMCATV, then the SMCV must be used as the Tier II LMCATV.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.570 Procedures for Deriving Bioaccumulation Factors for the Lake Michigan Basin

A bioaccumulation factor (BAF) is used to relate the concentration of a substance in an aquatic

organism to the concentration of the substance in the waters in which the organism resides when all routes of exposure (ambient water and food) are included. A BAF is used in the derivation of water quality criteria to protect wildlife and criteria and values to protect human health.

a) Selection of data. BAFs can be obtained or developed from one of the following methods, listed in order of preference.

1) Field-measured BAF.

2) Field-measured biota-sediment accumulation factor (BSAF).

3) Laboratory-measured bioconcentration factor (BCF).
The concentration of particulate organic carbon (POC) and dissolved organic carbon (DOC) in the test solution must ~~shall~~ be either measured or reliably estimated.

4) Predicted BCF.

Predicted baseline BCF = Kow.

b) Calculation of baseline BAFs for organic chemicals.
The most preferred BAF or BCF from above is used to calculate a baseline BAF which in turn is utilized to derive a human health or wildlife specific BAF.

1) Procedures for determining the necessary elements of baseline calculation.

A) Lipid normalization. The lipid-normalized concentration, $C_{~~i~~l}$, of a chemical in tissue is defined using the following equation:

$$C_{~~i~~l} = C_b / f_{~~i~~l}$$

Where:

~~C_b = concentration of the organic chemical in the tissue of aquatic biota (either whole organism or specified tissue) (µg/g)~~
~~f_i = fraction of the tissue that is lipid~~

C_b = concentration of the organic chemical in the tissue of

aquatic biota (either whole organism or specified tissue) (µg/g)
f_l = fraction of the tissue that is lipid

B) Bioavailability.
The fraction of the total chemical in the ambient water that is freely dissolved, f_{fd}, must ~~shall~~ be calculated using the following equation:

$$f_{fd} = 1 / \{ 1 + [(DOC)(Kow)/10] + [(POC)(Kow)] \}$$

Where:

~~DOC = concentration of dissolved organic carbon, kg of dissolved organic carbon/L of water~~
~~Kow = octanol-water partition coefficient of the chemical~~
~~POC = concentration of particulate organic carbon, kg of particulate organic carbon/L of water~~

DOC = concentration of dissolved organic carbon, kg of dissolved organic carbon/L of water
Kow = octanol-water partition coefficient of the chemical
POC = concentration of particulate organic carbon, kg of particulate organic carbon/L of water

C) Food Chain Multiplier (FCM). For an organic chemical, the FCM used must ~~shall~~ be taken from Table B-1 in Appendix B of 40 CFR 132~~, Appendix B (1996)~~ incorporated by reference at 35 Ill. Adm. Code 301.106 ~~Section 302.510~~.

2) Calculation of baseline BAFs.

A) From field-measured BAFs:

Baseline BAF = $\{ [\text{measured } BAF_{tT} / f_{fd}] - 1 \} \{ 1 / f_l \}$

Where:

~~BAF_{tT} = BAF based on total concentration in tissue and water of study organism and site~~
~~f_l = fraction of the tissue of study organism that is lipid~~
~~f_{fd} = fraction of the total chemical that is freely dissolved in the ambient water~~

BAF_{tT} = BAF based on total concentration in tissue and water of study organism and site
f_l = fraction of the tissue of study organism that is lipid
f_{fd} = fraction of the total chemical that is freely dissolved in the ambient water

B) From a field measured biota-sediment accumulation factor (BSAF):

$$(\text{Baseline BAF})_i = (\text{baseline BAF})_r\ (\text{BSAF})_i\ (\text{Kow})_i\ /\ (\text{BSAF})_r\ (\text{Kow})_r$$

Where:

~~$(BSAF)_i$ = BSAF for chemical "i"~~
~~$(BSAF)_r$ = BSAF for the reference chemical "r"~~
~~$(Kow)_i$ = octanol-water partition coefficient for chemical "i"~~
~~$(Kow)_r$ = octanol-water partition coefficient for the reference chemical "r"~~

$(BSAF)_i$ = BSAF for chemical "i"
$(BSAF)_r$ = BSAF for the reference chemical "r"
$(KOW)_i$ = octanol-water partition coefficient for chemical "i"
$(KOW)r$ = octanol-water partition coefficient for the reference chemical "r"

i) A BSAF must ~~shall~~ be calculated using the following equation:

$$BSAF = C_{~~l~~1} / C_{soc}$$

Where:

~~C_l = the lipid-normalized concentration of the chemical in tissue~~
~~C_{soc} = the organic carbon-normalized concentration of the chemical in sediment~~

C_1 = the lipid-normalized concentration of the chemical in tissue
C_{soc} = the organic carbon-normalized concentration of the chemical in sediment

ii) The organic carbon-normalized concentration of a chemical in sediment, C_{soc}, must ~~shall~~ be calculated using the following equation:

$$C_{soc} = C_s / f_{oc}$$

Where:

~~C_s = concentration of chemical in sediment (µg/g sediment)~~
~~f_{oc} = fraction of the sediment that is organic carbon~~

C_s = concentration of chemical in sediment (µg/g sediment)
f_{oc} = fraction of the sediment that is organic carbon

C) From a laboratory-measured BCF:

$$\text{baseline BAF} = (FCM) \{ [\text{measured } BCF_{tT} / f_{fd}] - 1 \} \{ 1 / f_{~~l~~1} \}$$

Where:

~~BCF_{tT} = BCF based on total concentration in tissue and water.~~
~~f_l = fraction of the tissue that is lipid~~

~~f_{fd} = fraction of the total chemical in the test water that is freely dissolved~~
~~FCM = the food-chain multiplier obtained from Table B-1 in Appendix B of 40 CFR 132, Appendix B, incorporated by reference at 35 Ill. Adm. Code 310.106 Section 302.510, by linear interpolation for trophic level 3 or 4, as necessary~~

BCF_{fT} = BCF based on total concentration in tissue and water.
f_l = fraction of the tissue that is lipid
f_{fd} = fraction of the total chemical in the test water that is freely dissolved
FCM = the food-chain multiplier obtained from Table B-1 in Appendix B of 40 CFR 132, incorporated by reference at 35 Ill. Adm. Code 301.106, by linear interpolation for trophic level 3 or 4, as necessary

D) From a predicted BCF:

baseline BAF = (FCM) (predicted baseline BCF) = (FCM)(Kow)

Where:

~~FCM = the food-chain multiplier obtained from Table B-1 in Appendix B of 40 CFR 132, Appendix 5, incorporated by reference at 35 Ill. Adm. Code 301.106 Section 302.510, by linear interpolation for trophic level 3 or 4, as necessary~~
~~Kow = octanol-water partition coefficient~~

FCM = the food-chain multiplier obtained from Table B-1 in Appendix B of 40 CFR 132, incorporated by reference at 35 Ill. Adm. Code 301.106 302.510, by linear interpolation for trophic level 3 or 4, as necessary
Kow = octanol-water partition coefficient

c) Human health and wildlife BAFs for organic chemicals:

1) Fraction freely dissolved (f_{fd}). By using the equation in subsection (b)(1)(B) ~~of this Section~~, the f_{fd} to be used to calculate human health and wildlife BAFs for an organic chemical must ~~shall~~ be calculated using a standard POC concentration of 0.00000004 kg/L and a standard DOC concentration of 0.000002 kg/L:

$$f_{fd} = 1 / [1+ (0.00000024 \text{ kg/L})(Kow)]$$

2) Human health BAF. The human health BAFs for an organic chemical must ~~shall~~ be calculated using the following equations:

A) For trophic level 3:

$$\text{Human Health BAF}_{HHTL3} = [(\text{baseline BAF})(0.0182) + 1] (f_{fd})$$

B) For trophic level 4:

$$\text{Human Health BAF}_{HHTL4} = [(\text{baseline BAF}) (0.0310) + 1] (f_{fd})$$

Where:

0.0182 and 0.0310 are the standardized fraction lipid values for trophic levels 3 and 4, respectively, that are used to derive human health criteria and values

3) Wildlife BAF. The wildlife BAFs for an organic chemical must ~~shall~~ be calculated using the following equations:

A) For trophic level 3:

$$\text{Wildlife BAF}_{WLTL3} = [(\text{baseline BAF})(0.0646) +1] (f_{fd})$$

B) For trophic level 4:

$$\text{Wildlife BAF}_{WLTL4} = [(\text{baseline BAF})(0.1031) + 1] (f_{fd})$$

Where:

0.0646 and 0.1031 are the standardized fraction lipid values for trophic levels 3 and 4, respectively, that are used to derive wildlife criteria

d) Human health and wildlife BAFs for inorganic chemicals. For inorganic chemicals the baseline BAFs for trophic levels 3 and 4 are both assumed to equal the BCF determined for the chemical with fish.

1) Human health. Measured BAFs and BCFs used to determine human health BAFs for inorganic chemicals must ~~shall~~ be based on concentration in edible tissue (e.g., muscle) of freshwater fish.

2) Wildlife. Measured BAFs and BCFs used to determine wildlife BAFs for inorganic chemicals must ~~shall~~ be based on concentration in the whole body of freshwater fish and invertebrates.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.575 Procedures for Deriving Tier I Water Quality Criteria and Values in the Lake Michigan Basin to Protect Wildlife

The Lake Michigan Basin Wildlife Criterion (LMWC) is the concentration of a substance which if not exceeded protects Illinois wild mammal and bird populations from adverse effects resulting from ingestion of surface waters of the Lake Michigan Basin and from ingestion of aquatic prey organisms taken from surface waters of the Lake Michigan Basin. Wildlife criteria calculated under this Section protect against long-term effects and are therefore considered chronic criteria. The methodology involves utilization of data from test animals to derive criteria to protect representative or target species: bald eagle, herring gull, belted kingfisher, mink and river otter. The lower of the geometric mean of species specific criteria for bird species or mammal species is chosen as the LMWC to protect a broad range of species.

a) This method must ~~shall~~ also be used for non-BCCs when appropriately modified to consider the following factors:

1) Selection of scientifically justified target species;

2) Relevant routes of chemical exposure;

3) Pertinent toxicity endpoints.

b) Minimum data requirements:

1) Test dose (TD). In order to calculate a LMWC the following minimal data base is required:

A) There must be at least one data set showing dose-response for oral, subchronic, or chronic exposure of 28 days for one bird species; and

B) There must be at least one data set showing dose-response for oral, subchronic, or chronic exposure of 90 days for one mammal species.

2) Bioaccumulation Factor (BAF) data requirements:

A) For any chemical with a BAF of less than 125 the BAF may be obtained by any method; and

B) For chemicals with a BAF of greater than 125 the BAF must come from a field measured BAF or Biota-Sediment Accumulation Factor (BSAF).

c) Principles for development of criteria

1) Dose standardization. The data for the test species must be expressed as, or converted to, the form mg/kg/d utilizing the guidelines for drinking and feeding rates and other procedures in 40 CFR 132, incorporated by reference in 35 Ill. Adm. Code 301.106~~ at Section 302.510~~.

2) Uncertainty factors (UF) for utilizing test dose data in the calculation of the target species value (TSV);

A) Correction for intermittent exposure. If the animals used in a study were not exposed to the toxicant each day of the test period, the no observed adverse effect level (NOAEL) must be multiplied by the ratio of days of exposure to the total days in the test period.

B) Correction from the lowest observed adverse effect level (LOAEL) to NOAEL ($UF_{~~l~~l}$). For those substances for which a LOAEL has been derived, the UF_l ~~mustshall~~must not be less than one and should not exceed 10.

C) Correction for subchronic to chronic extrapolation (UF_s). In instances where only subchronic data are available, the TD may be derived from subchronic data. The value of the UF_s ~~mustshall~~must not be less than one and should not exceed 10.

D) Correction for interspecies extrapolations (UF_a). For the derivation of criteria, a UF_a must ~~shall~~ not be less than one and should not exceed 100. The UF_a must ~~shall~~ be used only for extrapolating toxicity data across species within a taxonomic class. A species specific UF_a must ~~shall~~ be selected and applied to each target species, consistent with the equation in subsection (d).

d) Calculation of TSV. The TSV, measured in milligrams per liter (mg/L), is calculated according to the equation:

$$TSV = \{ [TD \times Wt] / [UF_a \times UF_s \times UF_{~~l~~l}] \} / \{ W + ~~\Sigma[F_{TLi}~~\Sigma[F_{TLi} \times BAF_{WLTLi}] \}$$

~~Where:~~

~~TSV = target species value in milligrams of substance per liter (mg/L).~~
~~TD = test dose that is toxic to the test species, either NOAEL or LOAEL.~~

~~UF_a = the uncertainty factor for extrapolating toxicity data across species (unitless). A species-specific UF_a mustshall be selected and applied to each target species, consistent with the equation.~~

~~UF_s = the uncertainty factor for extrapolating from subchronic to chronic exposures (unitless).~~

~~UF_l = the uncertainty factor for extrapolation from LOAEL to NOAEL (unitless)~~

~~Wt = average weight in kilograms (kg) of the target species.~~

~~W = average daily volume of water in liters consumed per day (L/d) by the target species.~~

~~F_{TLi} = average daily amount of food consumed by the target species in kilograms (kg/d) for trophic level i.~~

~~BAF_{WLTLi} = aquatic life bioaccumulation factor with units of liter per kilogram (L/kg), as derived from 35 Ill. Adm. Code Section 302.570 for trophic level i.~~

~~e)~~

Where:

TSV	=	target species value in milligrams of substance per liter (mg/L).
TD	=	test dose that is toxic to the test species, either NOAEL or LOAEL.
UF_a	=	the uncertainty factor for extrapolating toxicity data across species (unitless). A species-specific UF_a must be selected and applied to each target species, consistent with the equation.
Uf_s	=	the uncertainty factor for extrapolating from subchronic to chronic exposures (unitless).
Uf_l	=	the uncertainty factor for extrapolation from LOAEL to NOAEL (unitless).
Wt	=	average weight in kilograms (kg) of the target species.
W	=	average daily volume of water in liters consumed per day (L/d) by the target species.
F_{TLi}	=	average daily amount of food consumed by the target species in kilograms (kg/d) for trophic level i.
BAF_{WLTLi}	=	aquatic life bioaccumulation factor with units of liter per kilogram (L/kg), as derived from 35 Ill. Adm. Code 302.570 for trophic level i.

e) Calculation of the Lake Michigan Basin Wildlife Criterion. TSVs are obtained for each target species. The geometric mean TSVs of all mammal species is

calculated and also of all bird species. The LMWC is the lower of the bird or mammal geometric mean TSV.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.580 Procedures for Deriving Water Quality Criteria and Values in the Lake Michigan Basin to Protect Human Health - General

a) The Lake Michigan Basin human health criteria or values for a substance are those concentrations at which humans are protected from adverse effects resulting from incidental exposure to, or ingestion of, the waters of Lake Michigan and from ingestion of aquatic organisms taken from the waters of Lake Michigan. A Lake Michigan Human Health Threshold Criterion (LMHHTC) or Lake Michigan Human Health Threshold Value (LMHHTV) will be calculated for all substances according to 35 Ill. Adm. ~~Code~~~~Section~~Code 302.585, if data is available. Water quality criteria or values for substances which are, or may be, carcinogenic to humans will also be calculated according to procedures for the Lake Michigan Human Health Nonthreshold Criterion (LMHHNC) or the Lake Michigan Human Health Nonthreshold Value (LMHHNV) in 35 Ill. Adm. ~~Code~~~~Section~~Code 302.590.

b) Minimum data requirements for BAFs for Lake Michigan Basin human health criteria:

1) Tier I.

A) For all organic chemicals, either a field-measured BAF or a BAF derived using the BSAF methodology is required unless the chemical has a BAF less than 125, then a BAF derived by any methodology is required; and

B) For all inorganic chemicals, including organometals such as mercury, either a field-measured BAF or a laboratory-measured BCF is required.

2) Tier II. Any bioaccumulation factor method in 35 Ill. Adm. ~~Code~~~~Section~~Code 302.570(a) may be used to derive a Tier II criterion.

~~POLLUTION CONTROL BOARD~~

~~NOTICE OF PROPOSED AMENDMENTS~~

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.585 Procedures for Determining the Lake Michigan Basin Human Health Threshold Criterion (LMHHTC) and the Lake Michigan Basin Human Health Threshold Value (LMHHTV)

The LMHHTC or LMHHTV is derived for all toxic substances from the most sensitive end point for which there exists a dosage or concentration below which no adverse effect or response is likely to occur.

a) Minimum data requirements:

1) Tier I. The minimum data set sufficient to derive a Tier I LMHHTC ~~mustshall~~must include at least one epidemiological study or one animal study of greater than 90 days duration; or

2) Tier II. When the minimum data for deriving Tier I criteria are not available, a more limited database consisting of an animal study of greater than 28 days duration ~~mustshall~~must be used.

b) Principles for development of Tier I criteria and Tier II values:

1) The experimental exposure level representing the highest level tested at which no adverse effects were demonstrated (NOAEL) ~~mustshall~~must be used for calculation of a criterion or value. In the absence of a NOAEL, a LOAEL ~~mustshall~~must be used if it is based on relatively mild and reversible effects;

2) Uncertainty factors (UFs) must ~~shall~~ be used to account for the uncertainties in predicting acceptable dose levels for the general human population based upon experimental animal data or limited human data:

A) A UF of 10 must ~~shall~~ be used when extrapolating from experimental results of studies on prolonged exposure to average healthy humans;

B) A UF of 100 must ~~shall~~ be used when extrapolating from results of long-term studies on experimental animals;

C) A UF of up to 1000 must ~~shall~~ be used when extrapolating from animal studies for which the exposure duration is less than chronic, but greater than subchronic;

D) A UF of up to 3000 must ~~shall~~ be used when extrapolating from animal studies for which the exposure duration is less than subchronic;

E) An additional UF of between one and ten must ~~shall~~ be used when deriving a criterion from a LOAEL. The level of additional uncertainty applied ~~willshall~~will depend upon the severity and the incidence of the observed adverse effect;

F) An additional UF of between one and ten must ~~shall~~ be applied when there are limited effects data or incomplete sub-acute or chronic toxicity data;

3) The total uncertainty (~~Σ~~∑ of the uncertainty factors) must ~~shall~~ not exceed 10,000 for Tier I criterion and 30,000 for Tier II value; and

4) All study results must ~~shall~~ be converted to the standard unit for acceptable daily exposure of milligrams of toxicant per kilogram of body weight per day (mg/kg/day). Doses must ~~shall~~ be adjusted for continuous exposure.

c) Tier I criteria and Tier II value derivation.

1) Determining the Acceptable Daily Exposure (ADE)

ADE = test value / ~~Σ~~∑ of the UFs from subsection (b)(2) ~~of this Section~~

Where:

acceptable daily exposure is in milligrams toxicant per kilogram body weight per day (mg/kg/day)

2) Determining the Lake Michigan Basin Human Health Threshold Criterion

(LMHHTC) or the Lake Michigan Basin Human Health Threshold Value (LMHHTV)

LMHHTC or LMHHTV =

$$\{ ADE \times BW \times RSC \} /$$

$$\{ WC + [(FC_{TL3} \times BAF_{HHTL3}) + (FC_{TL4} \times BAF_{HHTL4})] \}$$

Where:

~~LMHHTC or LMHHTV is in milligrams per liter (mg/L)~~

~~ADE = acceptable daily intake in milligrams toxicant per kilogram body weight per day (mg/kg/day)~~

~~RSC = relative source contribution factor of 0.8~~

~~BW = weight of an average human (BW = 70 kg)~~

~~WC = per capita water consumption (both drinking and incidental exposure) for surface waters classified as public water supplies = two liters/day; or per capita incidental daily water ingestion for surface waters not used as human drinking water sources = 0.01 liters/day~~

~~FC_{TL3} = mean consumption of trophic level 3 fish by regional sport fishers of regionally caught freshwater fish = 0.0036 kg/day~~

~~FC_{TL4} = mean consumption of trophic level 4 fish by regional sport fishers of regionally caught freshwater fish = 0.0114 kg/day~~

~~BAF_{HHTL3} = human health bioaccumulation factor for edible portion of trophic level 3 fish, as derived using the BAF methodology in 35 Ill. Adm. Code~~Section 302.570

~~BAF_{HHTL4} = human health bioaccumulation factor for edible portion of trophic level 4 fish, as derived using the BAF methodology in 35 Ill. Adm. Code~~Section 302.570

LMHHTC or LMHHTV is in milligrams per liter (mg/L)		
ADE	=	acceptable daily intake in milligrams toxicant per kilogram body weight per day (mg/kg/day)
RSC	=	relative source contribution factor of 0.8
BW	=	weight of an average human (BW = 70 kg)
WC	=	per capita water consumption (both drinking and incidental exposure) for surface waters classified as public water supplies = two liters/day; or per capita incidental daily water ingestion for surface waters not used as human drinking water sources = 0.01 liters/day
FC_{TL3}	=	mean consumption of trophic level 3 fish by regional sport fishers of regionally caught freshwater fish = 0.0036 kg/day
FC_{TL4}	=	mean consumption of trophic level 4 fish by regional sport fishers of regionally caught freshwater fish = 0.0114 kg/day
BAF_{HHTL3}	=	human health bioaccumulation factor for edible portion of trophic level 3 fish, as derived using the BAF methodology in 35 Ill. Adm. Code 302.570
BAF_{HHTL4}	=	human health bioaccumulation factor for edible portion of trophic level 4 fish, as derived using the BAF methodology in 35 Ill. Adm. Code 302.570

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.590 Procedures for Determining the Lake Michigan Basin Human Health Nonthreshold Criterion (LMHHNC) or the Lake Michigan Basin Human Health Nonthreshold Value (LMHHNV)

A LMHHNC or LMHHNV must ~~shall~~ be derived for those toxic substances for which any exposure, regardless of extent, carries some risk of damage from cancer or a nonthreshold toxic mechanism. For single or combinations of substances, a risk level of 1 in 100,000 (or 10^{-5}) must ~~shall~~ be used for the purpose of determination of a LMHHNC or LMHHNV.

a) Minimum data requirements. Minimal experimental or epidemiological data requirements are incorporated in the cancer classification determined by USEPA at Appendix C II A to 40 CFR 132, incorporated by reference at 35 Ill. Adm. Code 301.106~~ Section 302.510~~.

b) Principles for development of criteria or values:

1) Animal data are fitted to a linearized multistage computer model (Global 1986 in ~~"~~"Mutagenicity and Carcinogenicity Assessment for 1, 3-Butadiene~~"~~" September 1985 EPA/600/8-85/004A, incorporated by reference at 35 Ill. Adm. ~~Code~~~~Section~~Code 301.106 or scientifically justified equivalents). The upper-bound 95 percent confidence limit on risk at the 1 in 100,000 risk level ~~must~~~~shall~~must be used to calculate a risk associated dose (RAD); and

2) A species scaling factor must~~ shall~~ be used to account for differences between test species and humans. Milligrams per surface area per day is an equivalent dose between species. All doses presented in mg/kg bodyweight will be converted to an equivalent surface area dose by raising the mg/kg dose to the 3/4 power.

c) Determining the risk associated dose (RAD). The RAD must~~ shall~~ be calculated using the following equation:

$$RAD = 0.00001 / q_1^*$$

Where:

~~RAD = risk associated dose in milligrams of toxicant or combinations of toxicants per kilogram body weight per day (mg/kg/day)~~

~~$0.00001 (1 X 10^{-5})$ = incremental risk of developing cancer equal to 1 in 100,000~~

~~q_1^* = slope factor $(mg/kg/day)^{-1}$~~

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RAD	=	risk associated dose in milligrams of toxicant or combinations of toxicants per kilogram body weight per day (mg/kg/day)
0.00001 (1 X 10^{-5})	=	incremental risk of developing cancer equal to 1 in 100,000
q_1*	=	slope factor $(mg/kg/day)^{-1}$
RAD	=	risk associated dose in milligrams of toxicant or combinations of toxicants per kilogram body weight per day (mg/kg/day)
0.00001 (1 X 10(-5))	=	incremental risk of developing cancer equal to 1 in 100,000
q_1*	=	slope factor $(mg/kg/day)^{-1}$

d) Determining the Lake Michigan Basin Human Health Nonthreshold Criterion (LMHHNC) or the Lake Michigan Basin Human Health Nonthreshold Value (LMHHNV):

LMHHNC or LMHHNV =

$$\{ RAD \times BW \} / \{ WC + [(FC_{TL3} \times BAF_{HHTL3}) + (FC_{TL4} \times BAF_{HHTL4})] \}$$

Where:

~~LMHHNC or LMHHNV is in milligrams per liter (mg/L)~~

~~RAD = risk associated dose of a substance or combination of substances in milligrams per day (mg/d) which is associated with a lifetime cancer risk level equal to a ratio of 1 to 100,000~~

~~BW = weight of an average human (BW = 70 kg)~~

~~WC = per capita water consumption for surface waters classified as public water supplies = 2 liters/day, or per capita incidental daily water ingestion for surface waters not used as human drinking water sources = 0.01 liters/day~~

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~~FC_{TL3} = mean consumption of trophic level 3 of regionally caught freshwater fish = 0.0036 kg/day~~

~~FC_{TL4} = mean consumption of trophic level 4 of regionally caught freshwater fish = 0.0114 kg/day~~

~~BAF_{HHTL3}, BAF_{HHTL4} = bioaccumulation factor for trophic levels 3 and 4 as derived in 35 Ill. Adm. Code Section 302.570~~

LMHHNC or LMHHNV is in milligrams per liter (mg/L)

RAD	=	risk associated dose of a substance or combination of substances in milligrams per day (mg/d) which is associated with a lifetime cancer risk level equal to a ratio of 1 to 100,000
BW	=	weight of an average human (BW = 70 kg)
WC	=	per capita water consumption for surface waters classified as public water supplies = two liters/day, or per capita incidental daily water ingestion for surface waters not used as human drinking water sources = 0.01 liters/day
FC_{TL3}	=	mean consumption of trophic level 3 of regionally caught freshwater fish = 0.0036 kg/day
FC_{TL4}	=	mean consumption of trophic level 4 of regionally caught freshwater fish = 0.0114 kg/day
BAF_{HHTL3}, BAF_{HHTL4}	=	bioaccumulation factor for trophic levels 3 and 4 as derived in 35 Ill. Adm. Code 302.570

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.595 Listing of Bioaccumulative Chemicals of Concern, Derived Criteria and Values

a) The Agency must ~~shall~~ maintain a listing of toxicity criteria and values derived ~~underpursuant to~~under this Subpart. This list must ~~shall~~ be made available to the public and updated whenever a new criterion or value is derived and must ~~shall~~ be

published when updated in the Illinois Register.

b) A criterion or value published ~~underpursuant to~~under subsection (a) ~~of this Section~~ may be proposed to the Board for adoption as a numeric water quality standard.

c) The Agency must~~ shall~~ maintain for inspection all information including~~, but not limited to~~, assumptions, toxicity data and calculations used in the derivation of any toxicity criterion or value listed pursuant to subsection (a)~~ of this Section~~ until adopted by the Board as a numeric water quality standard.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

SUBPART F: PROCEDURES FOR DETERMINING WATER QUALITY CRITERIA

Section 302.601 Scope and Applicability

This Subpart contains the procedures for determining the water quality criteria~~ set forth~~ in 35 Ill. Adm. ~~Code~~~~Sections~~Code 302.210(a), (b) and (c) and 302.410(a), (b) and (c).

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.603 Definitions

As used in this Subpart, the following terms~~ shall~~ have the meanings specified.

"Bioconcentration" means an increase in concentration of a chemical and its metabolites in an organism (or its specified tissues~~ thereof~~) relative to the concentration of the chemical in the ambient water acquired through contact with the water alone.

"Carcinogen" means a chemical which causes an increased incidence of benign or malignant neoplasms, or a statistically significant decrease in the latency period between exposure and onset of neoplasms in at least one mammalian species or man through epidemiological or clinical studies.

"EC-50" means the concentration of a substance or effluent which causes a given effect to 50% of the exposed organisms in a given time period.

"LC-50" means the concentration of a toxic substance or effluent which is lethal to 50% of the exposed organisms in a given time period.

"LOAEL" or "Lowest Observable Adverse Effect Level" means the lowest tested concentration of a chemical or substance which produces a statistically significant increase in frequency or severity of non-overt adverse effects between the exposed population and its appropriate control.

"MATC" or "Maximum Acceptable Toxicant Concentration" means the value obtained by calculating the geometric mean of the lower and upper chronic limits from a chronic test. A lower chronic limit is the highest tested concentration which did not cause the occurrence of a specified adverse effect. An upper chronic limit is the lowest tested concentration which did cause the occurrence of a specified adverse effect and above which all tested concentrations caused such an occurrence.

"NOAEL" or "No Observable Adverse Effect Level" means the highest tested concentration of a chemical or substance which does not produce a statistically significant increase in frequency or severity of non-overt adverse effects between the exposed population and its appropriate control.

"Resident or Indigenous Species" means species which currently live a substantial portion of their lifecycle or reproduce in a given body of water, or which are native species whose historical range includes a given body of water.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.604 Mathematical Abbreviations

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This Subpart uses ~~the~~~~The~~the following mathematical abbreviations ~~have been used in this Subpart~~:

~~exp x — base of the natural logarithm, e, raised to x-power~~
~~ln x — natural logarithm of x~~
~~log x — logarithm to the base 10 of x~~
~~A**B — A raised to the B-power~~
~~SUM(x) — summation of the values of x~~

exp x	base of the natural logarithm, e, raised to x-power
ln x	natural logarithm of x
log x	logarithm to the base 10 of x
A**B	A raised to the B-power
SUM(x)	summation of the values of x

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.606 Data Requirements

The Agency must ~~shall~~ review, for validity, applicability and completeness, data used in calculating criteria. To the extent available, and to the extent not otherwise specified, testing procedures, selection of test species and other aspects of data acquisition must be according to methods published by USEPA or nationally recognized standards organizations, including ~~but not limited to those~~ methods found in "Standard Methods", ~~as~~ incorporated by reference in 35 Ill. Adm. ~~Code 301.106, or approved by the American Society for Testing and Materials as incorporated by reference in 35 Ill. Adm.~~ Code 301.106.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.612 Determining the Acute Aquatic Toxicity Criterion for an Individual Substance - General Procedures

a) A chemical specific Acute Aquatic Toxicity Criterion (AATC) is calculated using procedures specified in 35 Ill. Adm. ~~Code~~~~Sections~~Code 302.615 and ~~302.618~~~~302.681~~302.618 if acute toxicity data are available for at least five ~~(5)~~ resident or indigenous species from five ~~(5)~~ different North American genera of freshwater organisms including representatives of the following taxa:

1) Representatives of two families in the Class Osteichthyes (Bony Fishes).

2) The family Daphnidae.

3) A benthic aquatic macroinvertebrate.

4) A vascular aquatic plant or a third family in the Phylum Chordata which may be from the Class Osteichthyes.

b) If data are not available for resident or indigenous species, data for non-resident species may be used if the non-resident species is of the same family or genus and has a similar habitat and environmental tolerance. The procedures of 35 Ill. Adm. ~~Code~~~~Section~~Code 302.615 must be used to obtain an AATC for individual substances whose toxicity is unaffected by ambient water quality characteristics. The procedures of 35 Ill. Adm. ~~Code~~~~Section~~Code 302.618 must be used if the toxicity of a substance is dependent upon some other water quality characteristic.

c) If data are not available that meet the requirements of subsection (a), an AATC is calculated by obtaining at least one EC-50 or LC-50 value from both a daphnid species and either fathead minnow or bluegill. If there are data available for any other North American freshwater species, they must also be included. An AATC is calculated by dividing the lowest Species Mean Acute Value (SMAV), as determined according to 35 Ill. Adm. ~~Code~~~~Section~~Code 302.615, by 10.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.615 Determining the Acute Aquatic Toxicity Criterion ~~-~~ Toxicity Independent of Water Chemistry

If the acute toxicity of the chemical has not been shown to be related to a water quality characteristic, including ~~but not limited to,~~ hardness, pH, temperature, etc., the AATC is calculated by using the procedures below.

a) For each species for which more than one acute value is available, the Species Mean Acute Value (SMAV) is calculated as the geometric mean of the acute values from all tests.

b) For each genus for which one or more SMAVs are available, the Genus Mean

Acute Value (GMAV) is calculated as the geometric mean of the SMAVs available for the genus.

c) The GMAVs are ordered from high to low.

d) Ranks (R) are assigned to the GMAVs from "~~1~~1" for the lowest to "N" for the highest. If two or more GMAVs are identical, successive ranks are arbitrarily assigned.

e) The cumulative probability, P, is calculated for each GMAV as R/(N + ~~1~~1).

f) The GMAVs to be used in the calculations of subsection (g) must be those with cumulative probabilities closest to 0.05. If there are less than 59 GMAVs in the total data set, the values utilized must be the lowest obtained through the ranking procedures of subsections (c) and (d). "T" is the number of GMAV's which are to be used in the calculations of subsection (g). T is equal to 4 when the data set includes at least one representative from each of the five taxa in 35 Ill. Adm. ~~Code~~~~Section~~Code 302.612 and a representative from each of the three taxa listed below. T is equal to 3 when the data includes at least one representative from each of the five taxa in 35 Ill. Adm. ~~Code~~~~Section~~Code 302.612 and from one or two of the taxa listed below. T is equal to 2 when the data set meets the minimum requirements of 35 Ill. Adm. ~~Code~~~~Section~~Code 302.612 but does not include representatives from any of the three taxa listed below. When toxicity data on any of the three taxa listed below are available, they must be used along with the minimum data required pursuant to 35 Ill. Adm. ~~Code~~~~Section~~Code 302.612.

1) A benthic crustacean, unless ~~onesuch~~one was used under ~~pursuant to~~ 35 Ill. Adm. ~~Code~~~~Section~~Code 302.612(a)(3), in which case an insect must be ~~used~~~~utilized~~used.

2) A member of a phylum not used in subsections (a), (b) or (f)(1).

3) An insect from an order not already represented.

g) Using the GMAVs and T-value identified under ~~pursuant to~~ subsection (f) and the Ps calculated ~~under~~~~pursuant to~~under subsection (e), the Final Acute Value (FAV) and the AATC are calculated as:

~~FAV = exp(A) and~~
~~AATC = FAV/2~~

FAV	=	exp(A) and
AATC	=	FAV/2

Where:

~~A = L + 0.2236 S;~~

~~L = [SUM(1n GMAV) - S(SUM(P**0.5))]/T; and~~

~~S = [[SUM((1n GMAV)**2) - ((SUM(1n GMAV))**2)/T]/[SUM(P) - ((SUM(P**0.5))**2)/T]]**0.5.~~

A	=	L + 0.2236 S;
L	=	[SUM(1n GMAV) - S(SUM(P**0.5))]/T; and
S	=	[[SUM((1n GMAV)**2) - ((SUM(1n GMAV))**2)/T]/[SUM(P) - ((SUM(P**0.5))**2)/T]]**0.5

h) If a resident or indigenous species, whose presence is necessary to sustain commercial or recreational activities, or prevent disruptions of the waterbody's ecosystem, including ~~but not limited to~~ loss of species diversity or a shift to a biotic community dominated by pollution-tolerant species, will not be protected by the calculated FAV, then the EC-50 or LC-50 for that species is used as the FAV.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.618 Determining the Acute Aquatic Toxicity Criterion - Toxicity Dependent on Water Chemistry

If data are available to show that a relationship exists between a water quality characteristic (WQC) and acute toxicity to two or more species, an Acute Aquatic Toxicity Criterion (AATC) may be calculated. The best documented relationship is that between the water quality characteristic, hardness and acute toxicity of metals. Although this relationship between hardness and acute toxicity is typically non-linear, it can be linearized by a logarithmic

transformation (i.e. for any variable, K, f(K) = logarithm of K) of the variables and plotting the logarithm of hardness against the logarithm of acute toxicity. Similarly, relationships between acute toxicity and other water quality characteristics, such as pH or temperature, may require a transformation, including no transformation (i.e. for any variable, K, f(K) = K) for one or both variables to obtain least squares linear regression of the transformed acute toxicity values on the transformed values of the water quality characteristic. An AATC is calculated using the following procedures:

a) For each species for which acute toxicity values are available at two or more different values of the water quality characteristic, a linear least squares regression of the transformed acute toxicity (TAT) values on the transformed water quality characteristic (TWQC) values is performed to obtain the slope of the line describing the relationship.

b) Each of the slopes determined pursuant to subsection (a) is evaluated as to whether or not it is statistically valid, taking into account the range and number of tested values of the water quality characteristic and the degree of agreement within and between species. If slopes are not available for at least one fish and one invertebrate species, or if the available slopes are too dissimilar, or if too few data are available to define the relationship between acute toxicity and the water quality characteristic, then the AATC must be calculated using the procedures in 35 Ill. Adm. ~~CodeSection~~Code 302.615.

c) Normalize the TAT values for each species by subtracting W, the arithmetic mean of the TAT values of a species from each of the TAT values used in the determination of the mean, such that the arithmetic mean of the normalized TAT values for each species individually or for any combination of species is zero (0.0).

d) Normalize the TWQC values for each species using X, the arithmetic mean of the TWQC values of a species, in the same manner as in subsection (c).

e) Group all the normalized data by treating them as if they were from a single species and perform at least squares linear regression of all the normalized TAT values on the corresponding normalized TWQC values to obtain the pooled acute slope, V.

f) For each species, the graphical intercept representing the species TAT intercept,

f(Y), at a specific selected value, Z, of the WQC is calculated using the equation:

$$f(Y) = W - V(X - g(Z))$$

Where:

f ( ) is the transformation used to convert acute toxicity values to TAT values;

Y is the species acute toxicity intercept or species acute intercept;

W is the arithmetic mean of the TAT values as specified in subsection (c);

V is the pooled acute slope as specified in subsection (e);

X is the arithmetic mean of the TWQC values as specified in subsection (d);

g ( ) is the transformation used to convert the WQC values to TWQC values; and

Z is a selected value of the WQC.

g) For each species, determine the species acute intercept, Y, by carrying out an inverse transformation of the species TAT value, f(Y). For example, in the case of a logarithmic transformation, Y = antilogarithm of (f (Y)); or in the case where no transformation is used, Y = f (Y).

h) The Final Acute Intercept (FAI) is derived by using the species acute intercepts, obtained from subsection (g), in ~~compliance~~~~accordance~~compliance with the procedures described in 35 Ill. Adm. ~~Code~~~~Section~~Code 302.615(b) through (g), with the word "value" replaced by the word "intercept". Note that in this procedure geometric means and natural logarithms are always used.

i) The Aquatic Acute Intercept (AAI) is obtained by dividing the FAI by two.

j) The AATC at any value of the WQC, denoted by WQCx, is calculated using the

terms defined in subsection (f) and the equation:

AATC = exp[V (g(WQCx) - g(Z)) + f (AAI)].

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.621 Determining the Acute Aquatic Toxicity Criterion - Procedure for Combinations of Substances

An AATC for any combination of substances (including effluent mixtures) must be determined by the following toxicity testing procedures:

a) Not more than 50% of test organisms from the most ~~sensitivesentitive~~sensitive species tested may exhibit mortality or immobility after a 48-hour test for invertebrate or a 96-hour test for fishes.

b) Three resident or indigenous species of ecologically diverse taxa must be tested initially. If resident or indigenous species are not available for testing, non-resident species may be used if the non-resident species is of the same family or genus and has a similar habitat and environmental tolerance.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.627 Determining the Chronic Aquatic Toxicity Criterion for an Individual Substance - General Procedures

a) A chemical-specific Chronic Aquatic Toxicity Criterion (CATC) is calculated using procedures specified in subsection (b) when chronic toxicity data are available for at least five species from five different North American genera of freshwater organisms, including representatives from the following taxa:

1) Representatives of two families in the Class Osteichthyes (Bony Fishes).

2) The family Daphnidae.

3) A benthic aquatic macroinvertebrate.

4) An alga (96-hour test) or a vascular aquatic plant.

b) A CATC is derived in the same manner as the FAV in 35 Ill. Adm. ~~Code~~~~Sections~~Code 302.615 or 302.618 by substituting CATC for FAV or FAI, chronic for acute, MATC for LC-50, SMCV (Species Mean Chronic Value) for SMAV, and GMCV (Genus Mean Chronic Value) for GMAV.

c) If data are not available to meet the requirements of subsection (a), a CATC is calculated by dividing the FAV by the highest acute-chronic ratio obtained from at least one fish and one invertebrate species. The acute-chronic ratio for a species equals the acute toxicity concentration from data considered under 35 Ill. Adm. ~~Code~~~~Sections~~Code 302.612 through 302.618, divided by the chronic toxicity concentration from data calculated under subsections (a) and (b) subject to the following conditions:

1) If the toxicity of a substance is related to any water quality characteristic (WQC), the acute-chronic ratio must be based on acute and chronic toxicity data obtained from organisms exposed to test water with WQC values that are representative of the WQC values of the waterbody under consideration. Preference under this subsection must be given to data from acute and chronic tests done by the same author or in the same reference in order to increase the likelihood of comparable test conditions.

2) If the toxicity of a substance is unrelated to water quality parameters, the acute-chronic ratio may be derived from any acute and chronic test on a species regardless of the similarity in values of those water quality parameters. Preference under this subsection must be given to data from acute and chronic tests done on the same organisms or their descendants.

3) If there is more than one acute-chronic ratio for a species, a geometric mean of the ratio is calculated, corrected for the relationship of toxicity to water quality parameters.

4) If the acute and chronic toxicity data indicate that the acute-chronic ratio varies with changes in water quality parameters, the acute-chronic ratio used over specified values of the water quality parameters must be based on the ratios at water quality parameter values closest to those specified.

5) If acute and chronic toxicity data are unavailable to determine an

acute-chronic ratio for at least two North American freshwater species, a ratio of 25 ~~mustshall~~must be used.

d) If a resident or indigenous species whose presence is necessary to sustain commercial or recreational activities, or prevent disruptions of the waterbody's ecosystem, including but not limited to loss of species diversity or a shift to a biotic community dominated by pollution-tolerant species, will not be protected by the calculated CATC, then the MATC for that species is used as the CATC.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.630 Determining the Chronic Aquatic Toxicity Criterion - Procedure for Combinations of Substances

A CATC for any combination of substances (including effluent mixtures) may be determined by toxicity testing procedures pursuant to the following:

a) A ~~No~~ combination of substances must not ~~may~~ exceed concentrations greater than a NOAEL as determined for the most sensitive of the species tested.

b) Three resident or indigenous species of ecologically diverse taxa must be tested initially. If resident or indigenous species are not available for testing, non-resident species may be used if the non-resident species is of the same family or genus and has a similar habitat and environmental tolerance.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.633 The Wild and Domestic Animal Protection Criterion

The Wild and Domestic Animal Protection Criterion (WDAPC) is the concentration of a substance which if not exceeded protects Illinois wild and domestic animals from adverse effects, such as functional impairment or pathological lesions, resulting from ingestion of surface waters of the State and from ingestion of aquatic organisms taken from surface waters of the State.

a) For those substances for which a NOAEL has been derived from studies of mammalian or avian species exposed to the substance via oral routes including

gavage, the lowest NOAEL among species must be used in calculating the WDAPC. Additional considerations in selecting NOAEL include:

1) If the NOAEL is given in milligrams of toxicant per liter of water consumed (mg/L), prior to calculating the WDAPC, the NOAEL must be multiplied by the daily average volume of water consumed by the test animals in liters per day (L/d) and divided by the average weight of the test animals in kilograms (kg).

2) If the NOAEL is given in milligrams of toxicant per kilogram of food consumed (mg/kg), prior to calculating the WDAPC, the NOAEL must be multiplied by the average amount of food in kilograms consumed daily by the test animals (kg/d) and divided by the average weight of the test animals in kilograms (kg).

3) If the animals used in a study were not exposed to the toxicant each day of the test period, the NOAEL must be multiplied by the ratio of days of exposure to the total days in the test period.

4) If more than one NOAEL is available for the same animal species, the geometric mean of the NOAELs must be used to calculate the WDAPC.

b) For those substances for which a NOAEL is not available but the lowest observed adverse effect level (LOAEL) has been derived from studies of animal species exposed to the substance via oral routes including gavage, one-tenth of the LOAEL ~~mustshall~~must be substituted for the NOAEL.

c) The LOAEL must be selected in the same manner as that specified for the NOAEL in subsection (a).

d) The WDAPC, measured in milligrams per liter (mg/L), is calculated according to the equation:

$$WDAPC = [0.1\ NOAEL \times Wt]/[W + (F \times BCF)]$$

Where:

~~NOAEL is derived from mammalian or avian studies as specified in subsections (a) and (b), and is measured in units of milligrams of substance per kilogram of body weight per day (mg/kg-d);~~

~~Wt = Average weight in kilograms (kg) of the test animals;~~

~~W = Average daily volume of water in liters consumed per day (L/d) by the test animals;~~

~~F = Average daily amount of food consumed by the test animals in kilograms (kg/d);~~

~~BCF = Aquatic life Bioconcentration Factor with units of liter per kilogram (L/kg), as derived in 35 Ill. Adm. Code Sections 302.660 through 302.666; and~~

~~The 0.1 represents an uncertainty factor to account for species variability.~~

NOAEL is derived from mammalian or avian studies as specified in subsections (a) and (b), and is measured in units of milligrams of substance per kilogram of body weight per day (mg/kg-d);

Wt = Average weight in kilograms (kg) of the test animals;

W = Average daily volume of water in liters consumed per day (l/d) by the test animals;

F = Average daily amount of food consumed by the test animals in kilograms (kg/d);

BCF = Aquatic life Bioconcentration Factor with units of liter per kilogram (L/kg), as derived in 35 Ill. Adm. Code 302.660 through 302.666; and

The 0.1 represents an uncertainty factor to account for species variability.

e) If no studies pertaining to the toxic substance in question can be found by the Agency, no criterion can be determined.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.645 Determining the Acceptable Daily Intake

The Acceptable Daily Intake (ADI) is the maximum amount of a substance which, if ingested daily for a lifetime, results in no adverse effects to humans. Subsections (a) through (e) list, in the order of preference, methods for determining the acceptable daily intake.

a) The lowest of the following ADI values:

1) For ~~those~~ substances ~~which are~~ listed with a maximum contaminant level in 40 CFR 141, incorporated by reference in 35 Ill. Adm. Code 301.106, or in 35 Ill. Adm. Code 611, the ADI equals the product of multiplying the maximum contaminant level given in milligrams per liter (mg/L) by 2 liters per day (L/d).

2) For ~~those~~ substances which are listed with a maximum allowable concentration standard in 35 Ill. Adm. Code~~:~~ Subtitle F, the acceptable daily intake equals the product of multiplying the public health enforcement standard given in milligrams per liter (mg/L) by 2 liters per day (L/d).

b) For ~~those~~ substances for which a no observed adverse effect level (NOAEL-H) for humans exposed to the substance in drinking water has been derived, the acceptable daily intake equals the product of multiplying one-tenth of the NOAEL-H given in milligrams of toxicant per liter of water consumed (mg/L), by 2 liters per day (L/d). The lowest NOAEL-H must be used in the calculation of the acceptable daily intake.

c) For ~~those~~ substances for which the lowest observed adverse effect level (LOAEL-H) for humans exposed to the substance in drinking water has been derived, one-hundredth of the LOAEL-H may be substituted for the NOAEL-H in subsection (b).

d) For ~~those~~ substances for which a no observed adverse effect level (NOAEL-A) has been derived from studies of mammalian test species exposed to the substance via oral routes including gavage, the acceptable daily intake equals the product of multiplying 1/100 of the NOAEL-A given in milligrams toxicant per day per kilogram of test species weight (mg/kg-d) by the average weight of an

adult human of 70 kilograms (kg). The lowest NOAEL-A among animal species must be used in the calculation of the acceptable daily intake. Additional considerations in selecting the NOAEL-A include:

1) If the NOAEL-A is given in milligrams of toxicant per liter of water consumed (mg/L) then, prior to calculating the acceptable daily intake, the NOAEL-A must be multiplied by the daily average volume of water consumed by the mammalian test species in liters per day (L/d) and divided by the average weight of the mammalian test species in kilograms (kg).

2) If the NOAEL-A is given in milligrams of toxicant per kilogram of food consumed (mg/kg), prior to calculating the acceptable daily intake the NOAEL-A must be multiplied by the average amount in kilograms of food consumed daily by the mammalian test species (kg/d) and divided by the average weight of the mammalian test species in kilograms (kg).

3) If the mammalian test species were not exposed to the toxicant each day of the test period, the NOAEL-A must be multiplied by the ratio of days of exposure to the total days of the test period.

4) If more than one NOAEL-A is available for the same mammalian test species, the geometric mean of the NOAEL-As must be used.

e) For ~~those~~ substances for which a NOAEL-A is not available but the lowest observed adverse effect level (LOAEL-A) has been derived from studies of mammalian test species exposed to the substance via oral routes including gavage, one-tenth of the LOAEL-A may be substituted for the NOAEL-A in subsection (d). The LOAEL-A must be selected in the same manner as that specified for the NOAEL-A in subsection (d).

f) If no studies pertaining to the toxic substance in question can be found by the Agency, no criterion can be determined.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.648 Determining the Human Threshold Criterion

The HTC is calculated according to the equation:

HTC = ADI/[W + (F x BCF)]

where:

~~HTC = Human health protection criterion in milligrams per liter (mg/L);~~

~~ADI = Acceptable daily intake of substance in milligrams per day (mg/d) as specified in 35 Ill. Adm. Code Section 302.645;~~

~~W = Per capita daily water consumption equal to 2 liters per day (L/d) for surface waters at the point of intake of a public or food processing water supply, or equal to 0.01 liters per day (L/d) which represents incidental exposure through contact or ingestion of small volumes of water while swimming or during other recreational activities for areas which are determined to be public access areas under 35 Ill. Adm. Code pursuant to Section 302.102 (b)(3), or 0.001 liters per day (L/d) for other waters;~~

~~F = Assumed daily fish consumption in the United States equal to 0.020 kilograms per day (kg/d); and~~

~~BCF = Aquatic organism Bioconcentration Factor with units of liter per kilogram (L/kg) as derived in 35 Ill. Adm. Code Sections 302.660 through 302.666.~~

HTC = Human health protection criterion in milligrams per liter (mg/L);

ADI = Acceptable daily intake of substance in milligrams per day (mg/d) as specified in 35 Ill. Adm. Code 302.645;

W = Per capita daily water consumption equal to 2 liters per day (L/d) for surface waters at the point of intake of a public or food processing water supply, or equal to 0.01 liters per day (L/d) which represents incidental exposure through contact or ingestion of small volumes of water while swimming or during other recreational activities

for areas which are determined to be public access areas under 35 Ill. Adm. Code Section 302.102 (b)(3), or 0.001 liters per day (L/d) for other waters;

F = Assumed daily fish consumption in the United States equal to 0.020 kilograms per day (kg/d); and

BCF = Aquatic organism Bioconcentration Factor with units of liter per kilogram (L/kg) as derived in 35 Ill. Adm. Code 302.660 through 302.666.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.651 The Human Nonthreshold Criterion

The Human Nonthreshold Criterion (HNC) of a substance is that concentration or level of a substance at which humans are protected from an unreasonable risk of disease caused by a nonthreshold toxic mechanism as a result of incidental exposure to or ingestion of surface waters of the State and from ingestion of aquatic organisms taken from surface waters of the State. HNCs are derived for those toxic substances for which any exposure, regardless of extent, carries some risk of damage as specified in subsections (a) and (b).

a) For single substances, a risk level of one in one million (1 in 1,000,000) ~~mustshall~~must be allowed (i.e, considered acceptable) for the purposes of ~~determiningdetermination of~~determining an HNC.

b) For mixtures of substances, an additive risk level of one in one hundred thousand (1 in 100,000) ~~mustshall~~must be allowed (i.e, considered acceptable) for the purposes of ~~determiningdetermination of~~determining an HNC.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.654 Determining the Risk Associated Intake

The Risk Associated Intake (RAI) is the maximum amount of a substance which if ingested daily for a lifetime is expected to result in the risk of one additional case of human cancer in a population of one million. Where more than one carcinogenic chemical is present, the RAI ~~mustshall~~must be based on an allowed additive risk of one additional case of cancer in a population of one hundred thousand. The RAI must be derived as specified in subsections (a) through (c).

a) For those substances for which a human epidemiologic study has been performed, the RAI equals the product of the dose from exposure in units of milligrams toxicant per kilogram body weight per day (mg/kg-d) that results in a 70-year lifetime cancer probability of one in one million, times the average weight of an adult human of 70 kilograms (kg). The resulting RAI is expressed in milligrams toxicant per day (mg/d). If more than one human epidemiologic study is available, the lowest exposure level resulting in a 70-year lifetime probability of cancer equal to a ratio of one in one hundred thousand must be used in calculating the RAI.

b) In the absence of an epidemiologic study, for those toxic substances for which a carcinogenic potency factor (CPF) has been derived from studies of mammalian test species the risk associated intake is calculated from the equation:

RAI = K/CPF

Where:

~~RAI = Risk associated intake in milligrams per day (mg/d);~~

~~K = A constant consisting of the product of the average weight of an adult human, assumed to be 70 kg, and the allowed cancer risk level of one in one million (1/1,000,000); and~~

~~CPF = Carcinogenic Potency Factor is the risk of one additional cancer per unit dose from exposure. The CPF is expressed in units of inverse milligrams per kilogram-day (1/mg/kg-d) as derived in subsections (b)(1) through (b)(7).~~

RAI = Risk associated intake in milligrams per day (mg/d);

K = A constant consisting of the product of the average weight of an adult human, assumed to be 70 kg, and the allowed cancer risk level of one in one million (1/1,000,000); and

CPF = Carcinogenic Potency Factor is the risk of one additional cancer per unit dose from exposure. The CPF is expressed in units of inverse milligrams per kilogram - day (l/mg/kg-d) as derived in

subsections (b)(1) through (b)(7).

1) Only those studies which fulfill the data requirement criteria of 35 Ill. Adm. ~~Code~~~~Section~~Code 302.606 ~~must~~~~shall~~must be used in calculating the CPF.

2) The linear non-threshold dose-response relationship developed in the same manner as in the USEPA document "Mutagenicity and Carcinogenicity Assessment of 1,3-butadiene", incorporated by reference in 35 Ill. Adm. Code 301.106, must ~~shall~~ be used in obtaining the unit risk, defined as the 95th percentile upper bound risk of one additional cancer resulting from a life time exposure to a unit concentration of the substance being considered. The CPF ~~must~~~~shall~~must be estimated from the unit risk in ~~compliance~~~~accordance~~compliance with subsection (b)(7). In calculating a CPF, the Agency must review alternate scientifically valid protocols if so requested.

3) If in a study of a single species more than one type of tumor is induced by exposure to the toxic substance, the highest of the CPFs is used.

4) If two or more studies vary in either species, strain or sex of the test animal, or in tumor type, the highest CPF is used.

5) If more than one tumor of the same type is found in some of the test animals, these should be pooled so that the dose response relationship is dose versus number of tumors per animal. The potency estimate for this dose response relationship is used if it is higher than estimates resulting from other methods.

6) If two or more studies are identical regarding species, strain and sex of the test animal, and tumor type, the highest of the CPFs is used.

7) Calculation of an equivalent dose between animal species and humans using a surface area conversion, and conversion of units of exposure to dose in milligrams of toxicant per kilogram of body weight per day (mg/kg-d) must be performed as specified in the USEPA document "Mutagenicity and Carcinogenicity Assessment of 1,3-butadiene", incorporated by reference in 35 Ill. Adm. Code 301.106.

c) If both a human epidemiologic study and a study of mammalian test species are available for use in subsections (a) and (b), the risk associated intake is determined as follows:

1) When the human epidemiologic study provides evidence of a carcinogenic effect on humans, the RAI is calculated from the human epidemiology study as specified in subsection (a).

2) When the mammalian study provides evidence a carcinogenic effect on humans, but the human epidemiologic study does not, a cancer risk to humans is assumed and the risk associated intake is calculated as specified in subsection (b).

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.657 Determining the Human Nonthreshold Criterion

The HNC is calculated according to the equation:

$$HNC = RAI/[W + (F \times BCF)]$$

where:

~~HNC = Human Nonthreshold Protection Criterion in milligrams per liter (mg/L);~~

~~RAI = Risk Associated Intake of a substance in milligrams per day (mg/d) which is associated with a lifetime cancer risk level equal to a ratio of one to 1,000,000 as derived in 35 Ill. Adm. Code Section 302.654;~~

~~W = Per capita daily water consumption equal to 2 liters per day (L/d) for surface waters at the point of intake of a public or food processing water supply, or equal to 0.01 liters per day (L/d) which represents incidental exposure through contact or ingestion of small volumes of water while swimming or during other recreational activities for areas which are determined to be public access areas under 35 Ill. Adm.~~

~~Code~~pursuant to ~~Section 302.102(b)(3), or 0.001 liters per day (L/d) for other waters;~~

~~F = Assumed daily fish consumption in the United States equal to 0.020 kilograms per day (kg/d); and~~

~~BCF = Aquatic Life Bioconcentration Factor with units of liter per kilogram (L/kg) as derived in 35 Ill. Adm. Code~~Section ~~302.663.~~

HNC = Human Nonthreshold Protection Criterion in milligrams per liter (mg/L);

RAI = Risk Associated Intake of a substance in milligrams per day (mg/d) which is associated with a lifetime cancer risk level equal to a ratio of one to 1,000,000 as derived in 35 Ill. Adm. Code 302.654;

W = Per capita daily water consumption equal to 2 liters per day (L/d) for surface waters at the point of intake of a public or food processing water supply, or equal to 0.01 liters per day (L/d) which represents incidental exposure through contact or ingestion of small volumes of water while swimming or during other recreational activities for areas which are determined to be public access areas under 35 Ill. Adm. Code 302.102(b)(3), or 0.001 liters per day (L/d) for other waters;

F = Assumed daily fish consumption in the United States equal to 0.020 kilograms per day (kg/d); and

BCF = Aquatic Life Bioconcentration Factor with units of liter per kilogram (L/kg) as derived in 35 Ill. Adm. Code 302.663.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.658 Stream Flow for Application of Human Nonthreshold Criterion

The HNC applies ~~shall apply~~ at all times except during periods when flows are less than the harmonic mean flow (Qhm), as determined by:

Qhm = N / SUM(1/Qi)

Where:

~~Qhm = harmonic mean flow,~~

~~N = number of daily values for stream flows, and~~

~~Qi = daily streamflow value on day i.~~

Qhm = harmonic mean flow,
N = number of daily values for stream flows, and
Qi = daily streamflow value on day i.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.663 Determination of Bioconcentration Factors

A Bioconcentration Factor equals the concentration of a substance in all or part of an aquatic organism in milligrams per kilogram of wet tissue weight (mg/kg), divided by the concentration of the substance in the water to which the organism is exposed in milligrams of the substance per liter of water (mg/L).

a) The Bioconcentration Factor is calculated from a field study if the following conditions are met:

1) Data are available to show that the concentration of the substance in the water to which the organism was exposed remained constant over the range of territory inhabited by the organism and for a period of time exceeding 28 days;

2) Competing mechanisms for removal of the substance from solution did not affect the bioavailability of the substance; and

3) The concentration of the substance to which the organism was exposed is less than the lowest concentration causing any adverse effects on the organism.

b) In the absence of a field-derived Bioconcentration Factor, the Bioconcentration Factor is calculated from a laboratory test if the following conditions are met:

1) The Bioconcentration Factor was calculated from measured concentrations of the toxic substance in the test solution;

2) The laboratory test was of sufficient duration to have reached steady-state which is defined as a less than 10 percent change in the calculated Bioconcentration Factor over a 2-day period or 16 percent of the test duration whichever is longer. In the absence of a laboratory test which has reached steady-state, the Bioconcentration Factor may be calculated from a laboratory test with a duration greater than 28 days if more than one test is available for the same species of organism;

3) The concentration of the toxic substance to which the test organism was exposed is less than the lowest concentration causing any adverse effects on the organism;

4) If more than one Bioconcentration Factor for the same species is available, the geometric mean of the Bioconcentration Factors is used; and

5) The Bioconcentration Factor is calculated on a wet tissue weight basis. A Bioconcentration Factor calculated using dry tissue weight must ~~shall~~ be converted to a wet tissue weight basis by multiplying the dry weight bioconcentration value by 0.1 for plankton and by 0.2 for individual species of fishes and invertebrates.

c) In the absence of any Bioconcentration Factors measured from field studies as specified in subsection (a) or laboratory studies which have reached steady-state as specified in subsection (b), the Bioconcentration Factor is calculated according to the equation:

$$\log BCF = A + B \log Kow$$

Where:

BCF = Bioconcentration Factor;

Kow = The octanol/water partition coefficient measured as specified in ASTM E 1147, incorporated by reference in 35 Ill. Adm. Code 301.106 (If the Kow is not available from laboratory testing, it ~~mustshall~~must be calculated from structure-activity relationships or available regression equations.); and

The constants A = -0.23 and B = 0.76 ~~mustshall~~must be used unless a change in the value of the constants is requested (The Agency ~~mustshall~~must honor requests for changes only if such changes are accompanied by scientifically valid supporting data.).

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.666 Utilizing the Bioconcentration Factor

The Bioconcentration Factor derived in 35 Ill. Adm. ~~Code~~~~Section~~Code 302.663 is used to calculate water quality criteria for a substance as specified below:

a) When calculating a WDAPC as described in 35 Ill. Adm. ~~Code~~~~Section~~ Code 302.633, the geometric mean of all available steady-state whole body Bioconcentration Factors for fish and shellfish species which constitutes or represents a portion of the diet of indigenous wild and domestic animal species is used. Additional considerations in deriving a Bioconcentration Factor include:

1) An edible portion Bioconcentration Factor is converted to a whole body Bioconcentration Factor for a fish or shellfish species by multiplying the edible portion Bioconcentration Factor by the ratio of the percent lipid in the whole body to the percent lipid in the edible portion of the same species.

2) A Bioconcentration Factor calculated as described in 35 Ill. Adm. ~~Code~~~~Section~~Code 302.663(c) is converted to a whole body Bioconcentration Factor by multiplying the calculated Bioconcentration Factor by the ratio of the percent lipid in the whole body to 7.6.

b) When calculating either a human threshold criterion or a human nonthreshold criterion as described in 35 Ill. Adm. ~~Code~~~~Sections~~Code 302.642 through 302.648 and 35 Ill. Adm. ~~Code~~~~Sections~~Code 302.651 through 302.657, respectively, the

geometric mean of all available edible portion Bioconcentration Factors for fish and shellfish species consumed by humans is used. Additional considerations in deriving a Bioconcentration Factor include:

1) Edible portions include:

A) Decapods ~~--~~ muscle tissue.

B) Bivalve molluscs ~~--~~ total living tissue.

C) Scaled fishes ~~--~~ boneless, scaleless filets including skin except for bloater chubs in which the edible portion is the whole body excluding head, scales and ~~visceravisera~~viscera.

D) Smooth-skinned fishes ~~--~~ boneless, skinless filets.

2) A whole body Bioconcentration Factor is converted to an edible portion Bioconcentration Factor by multiplying the whole body Bioconcentration Factor of a species by the ratio of the percent lipid in the edible portion to the percent lipid in the whole body of the same species.

3) A Bioconcentration Factor calculated as described in 35 Ill. Adm. ~~CodeSection~~ Code 302.663 is converted to an edible portion Bioconcentration Factor by multiplying the calculated Bioconcentration Factor by the ratio of the percent lipid in the edible portion to 7.6.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 302.669 Listing of Derived Criteria

a) The Agency must ~~shall~~ develop and maintain a listing of toxicity criteria pursuant to this Subpart. This list must ~~shall~~ be made available to the public and updated whenever a new criterion is derived and must ~~shall~~ be published when updated in the Illinois Register.

b) A criterion published pursuant to subsection (a) may be proposed to the Board for adoption as a numeric water quality standard.

c) The Agency must~~ shall~~ maintain for inspection all information including~~, but not limited to,~~ assumptions, toxicity data and calculations used to ~~derive~~in the ~~derivation of~~derive any toxicity criterion listed pursuant to subsection (a) until adopted by the Board as a water quality standard.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

~~POLLUTION CONTROL BOARD~~

~~NOTICE OF PROPOSED AMENDMENTS~~

Section 302.APPENDIX A References to Previous Rules (Repealed)

~~The following table is provided to aid in referencing old Board rule numbers to section numbers pursuant to codification.~~

~~Chapter 3: Water Pollution Part II, Water Quality Standards~~	~~35 Ill. Admin. Code Parts 302 and 303~~
~~Unnumbered Preamble~~	~~Section 302.101~~
~~Rule 201~~	~~Section 302.102~~
~~Rule 202~~	~~Section 302.103~~
~~Rule 203~~	~~Section 302.201,~~ ~~Section 302.202,~~ ~~Section 303.201~~
~~Rule 203(a)~~	~~Section 302.203~~
~~Rule 203(b)~~	~~Section 302.204~~
~~Rule 203(c)~~	~~Section 302.205~~
~~Rule 203(d)~~	~~Section 302.206~~
~~Rule 203(e)~~	~~Section 302.207~~
~~Rule 203(f)~~	~~Section 302.208~~
~~Rule 203(g)~~	~~Section 302.209~~
~~Rule 203(h)~~	~~Section 302.210~~
~~Rule 203(i)~~	~~Section 302.211(a)~~
~~Rule 203(i)(1)~~	~~Section 302.211(b)~~
~~Rule 203(i)(2)~~	~~Section 302.211(c)~~
~~Rule 203(i)(3)~~	~~Section 302.211(d)~~
~~Rule 204(i)(4)~~	~~Section 302.211(e)~~ ~~Section 303.311~~ ~~Section 303.321~~ ~~Section 303.331~~ ~~Section 303.341~~ ~~Section 303.351~~ ~~Section 303.361~~
~~Rule 203(i) (Unnumbered Paragraph)~~	~~Section 302.104~~
~~Rule 203(i)(5)~~	~~Section 302.211(f)~~
~~Rule 203(i)(6)~~	~~Section 302.211(g)~~
~~Rule 203(i)(7)~~	~~Section 302.211(h)~~
~~Rule 203(i)(8)~~	~~Section 302.211(i)~~
~~Rule 203(i)(9)~~	~~Deleted~~

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~~Rule 203(i)(10)~~	~~Section 302.211(j), 303.500~~
~~Rule 203(i)(11)(bb)~~	~~Section 303.502~~
~~Rule 203.1(a)~~	~~Section 303.312~~
~~Rule 203.1(b)~~	~~Section 303.352~~
~~Rule 204~~	~~Section 302.301~~
	~~Section 302.302~~
	~~Section 303.202~~
~~Rule 204(a)~~	~~Section 302.303~~
~~Rule 204(b)~~	~~Section 302.304~~
~~Rule 204(c)~~	~~Section 302.305~~
~~Rule 205~~	~~Section 302.401~~
~~Rule 205(a)~~	~~Section 302.403~~
~~Rule 205(b)~~	~~Section 302.404~~
~~Rule 205(c)~~	~~Section 302.405~~
~~Rule 205(d)~~	~~Section 302.406~~
~~Rule 205(e)~~	~~Section 302.407~~
~~Rule 205(f)~~	~~Section 302.408~~
~~Rule 205(g)~~	~~Section 302.409~~
~~Rule 205(h)~~	~~Section 302.410~~
~~Rule 206~~	~~Section 302.501~~
~~Rule 206(a)~~	~~Section 302.502~~
~~Rule 206(b)~~	~~Section 302.503~~
~~Rule 206(c)~~	~~Section 302.504~~
~~Rule 206(d)~~	~~Section 302.505~~
~~Rule 206(e)~~	~~Section 302.506(a)~~
~~Rule 206(e)(1)(A)~~	~~Section 302.507(a)~~
~~Rule 206(e)(1)(B)~~	~~Section 302.507(b)~~
~~Rule 206(e)(1)(C)~~	~~Section 302.506(b)~~
~~Rule 206(e)(1)(D)~~	~~Section 302.506(c)~~
~~Rule 206(e)(2)~~	~~Section 302.508~~
~~Rule 206(e)(3)~~	~~Section 302.509~~
~~Rule 207~~	~~Section 303.203~~
~~Rule 208~~	~~Section 302.105~~

(Source: Repealed at 46 Ill. Reg. _____, effective _____)

POLLUTION CONTROL BOARD

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Section 302.APPENDIX B Sources of Codified Sections (Repealed)

35 Ill. Adm. Code Parts 302 and 303	Chapter 3: Water Pollution Part II, Water Quality Standards Part III, Water Use Designations
Section	
302.101	General, Unnumbered preamble to Part II
302.102(a)	Rule 201(a)
302.102(b)	Rule 201(a)
302.102(c)	Rule 201(b)
302.103	Rule 202
302.104	Rule 203(i)
302.105	Rule 208
302.201	General, Rule 203
302.202	Rule 203
302.203	Rule 203(a)
302.204	Rule 203(b)
302.205	Rule 203(c)
302.206	Rule 203(d)
302.207	Rule 203(e)
302.208	Rule 203(f)
302.209	Rule 203(g)
302.210	Rule 203(h)
302.211(a)	Rule 203(i)
302.211(b)	Rule 203(i)(1)
302.211(c)	Rule 203(i)(2)
302.211(d)	Rule 203(i)(3)
302.211(e)	Rule 203(i)(4)
302.211(f)	Rule 203(i)(5)
302.211(g)	Rule 203(i)(6)
302.211(h)	Rule 203(i)(7)
302.211(i)	Rule 203(i)(8)
302.211(j)	Rule 203(i)(10)
302.301	General, Rule 204, Rule 303

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~~302.302~~	~~Rule 204~~
~~302.303~~	~~Rule 204(a)~~
~~302.304~~	~~Rule 204(b)~~
~~302.305~~	~~Rule 204(c)~~
~~302.401~~	~~General, Rule 205, Rule 302~~
~~302.402~~	~~Rule 302~~
~~302.403~~	~~Rule 205(a)~~
~~302.404~~	~~Rule 205(b)~~
~~302.405~~	~~Rule 205(c)~~
~~302.406~~	~~Rule 205(d)~~
~~302.407~~	~~Rule 205(e)~~
~~302.408~~	~~Rule 205(f)~~
~~302.409~~	~~Rule 205(g)~~
~~302.410~~	~~Rule 205(h)~~
~~302.501~~	~~General, Rule 206~~
~~302.502~~	~~Rule 206(a)~~
~~302.503~~	~~Rule 206(b)~~
~~302.504~~	~~Rule 206(c)~~
~~302.505~~	~~Rule 206(d)~~
~~302.506(a)~~	~~Rule 206(e)~~
~~302.506(b)~~	~~Rule 206(e)(1)(C)~~
~~302.506(c)~~	~~Rule 206(e)(1)(D)~~
~~302.507(a)~~	~~Rule 206(e)(1)(A)~~
~~302.507(b)~~	~~Rule 206(e)(1)(B)~~
~~302.508~~	~~Rule 206(e)(2)~~
~~302.509~~	~~Rule 206(e)(3)~~

(Source: Repealed at 46 Ill. Reg. _____, effective _____)

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