

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

PART 302  
WATER QUALITY STANDARDS

SUBPART A: GENERAL WATER QUALITY PROVISIONS

Section	
302.100	Definitions
302.101	Scope and Applicability
302.102	Allowed Mixing, Mixing Zones and ZIDs
302.103	Stream Flows
302.104	Main River Temperatures
302.105	Antidegradation

SUBPART B: GENERAL USE WATER QUALITY STANDARDS

Section	
302.201	Scope and Applicability
302.202	Purpose
302.203	Offensive Conditions
302.204	pH
302.205	Phosphorus
302.206	Dissolved Oxygen
302.207	Radioactivity
302.208	Numeric Standards for Chemical Constituents
302.209	Fecal Coliform
302.210	Other Toxic Substances
302.211	Temperature
302.212	Total Ammonia Nitrogen
302.213	Effluent Modified Waters (Ammonia)(Repealed)

SUBPART C: PUBLIC AND FOOD PROCESSING WATER SUPPLY STANDARDS

Section	
302.301	Scope and Applicability
302.302	Algicide Permits
302.303	Finished Water Standards
302.304	Chemical Constituents
302.305	Other Contaminants
302.306	Fecal Coliform
302.307	Radium 226 and 228

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

Section	
302.401	Scope and Applicability
302.402	Purpose
302.403	Unnatural Sludge
302.404	pH
302.405	Dissolved Oxygen
302.406	Fecal Coliform (Repealed)
302.407	Chemical Constituents
302.408	Temperature
302.409	Cyanide for the South Fork of the South Branch of the Chicago River (Bubbly Creek)
302.410	Other Toxic Substances
302.412	Total Ammonia Nitrogen

SUBPART E: LAKE MICHIGAN BASIN WATER QUALITY STANDARDS

Section	
302.501	Scope, Applicability, and Definitions
302.502	Dissolved Oxygen
302.503	pH
302.504	Chemical Constituents
302.505	Fecal Coliform
302.506	Temperature
302.507	Thermal Standards for Existing Sources on January 1, 1971
302.508	Thermal Standards for Sources Under Construction But Not In Operation on January 1, 1971
302.509	Other Sources
302.510	Incorporations by Reference ( <u>Repealed</u> )
302.515	Offensive Conditions
302.520	Regulation and Designation of Bioaccumulative Chemicals of Concern (BCCs)
302.521	Supplemental Antidegradation Provisions for Bioaccumulative Chemicals of Concern (BCCs)
302.525	Radioactivity
302.530	Supplemental Mixing Provisions for Bioaccumulative Chemicals of Concern (BCCs)
302.535	Ammonia Nitrogen
302.540	Other Toxic Substances
302.545	Data Requirements
302.550	Analytical Testing
302.553	Determining the Lake Michigan Aquatic Toxicity Criteria or Values – General Procedures

- 302.555 Determining the Tier I Lake Michigan Acute Aquatic Toxicity Criterion (LMAATC): Independent of Water Chemistry
- 302.560 Determining the Tier I Lake Michigan Basin Acute Aquatic Life Toxicity Criterion (LMAATC): Dependent on Water Chemistry
- 302.563 Determining the Tier II Lake Michigan Basin Acute Aquatic Life Toxicity Value (LMAATV)
- 302.565 Determining the Lake Michigan Basin Chronic Aquatic Life Toxicity Criterion (LMCATC) or the Lake Michigan Basin Chronic Aquatic Life Toxicity Value (LMCATV)
- 302.570 Procedures for Deriving Bioaccumulation Factors for the Lake Michigan Basin
- 302.575 Procedures for Deriving Tier I Water Quality Criteria and Values in the Lake Michigan Basin to Protect Wildlife
- 302.580 Procedures for Deriving Water Quality Criteria and Values in the Lake Michigan Basin to Protect Human Health – General
- 302.585 Procedures for Determining the Lake Michigan Basin Human Health Threshold Criterion (LMHHTC) and the Lake Michigan Basin Human Health Threshold Value (LMHHTV)
- 302.590 Procedures for Determining the Lake Michigan Basin Human Health Nonthreshold Criterion (LMHHNC) or the Lake Michigan Basin Human Health Nonthreshold Value (LMHHNV)
- 302.595 Listing of Bioaccumulative Chemicals of Concern, Derived Criteria and Values

#### SUBPART F: PROCEDURES FOR DETERMINING WATER QUALITY CRITERIA

- | Section |   |
|---------|---|
| 302.601 | Scope and Applicability   |
| 302.603 | Definitions   |
| 302.604 | Mathematical Abbreviations  |
| 302.606 | Data Requirements   |
| 302.612 | Determining the Acute Aquatic Toxicity Criterion for an Individual Substance – General Procedures   |
| 302.615 | Determining the Acute Aquatic Toxicity Criterion – Toxicity Independent of Water Chemistry          |
| 302.618 | Determining the Acute Aquatic Toxicity Criterion – Toxicity Dependent on Water Chemistry            |
| 302.621 | Determining the Acute Aquatic Toxicity Criterion – Procedure for Combinations of Substances         |
| 302.627 | Determining the Chronic Aquatic Toxicity Criterion for an Individual Substance – General Procedures |
| 302.630 | Determining the Chronic Aquatic Toxicity Criterion – Procedure for Combinations of Substances       |
| 302.633 | The Wild and Domestic Animal Protection Criterion   |
| 302.642 | The Human Threshold Criterion   |
| 302.645 | Determining the Acceptable Daily Intake   |
| 302.648 | Determining the Human Threshold Criterion   |

302.651	The Human Nonthreshold Criterion
302.654	Determining the Risk Associated Intake
302.657	Determining the Human Nonthreshold Criterion
302.658	Stream Flow for Application of Human Nonthreshold Criterion
302.660	Bioconcentration Factor
302.663	Determination of Bioconcentration Factor
302.666	Utilizing the Bioconcentration Factor
302.669	Listing of Derived Criteria
302.APPENDIX A	References to Previous Rules
302.APPENDIX B	Sources of Codified Sections
302.APPENDIX C	Maximum total ammonia nitrogen concentrations allowable for certain combinations of pH and temperature
302.TABLE A	pH-Dependent Values of the AS (Acute Standard)
302.TABLE B	Temperature and pH-Dependent Values of the CS (Chronic Standard) for Fish Early Life Stages Absent
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 R\_\_-\_\_ at \_\_ Ill. Reg. \_\_\_\_\_, effective \_\_\_\_\_.

## SUBPART A: GENERAL WATER QUALITY PROVISIONS

### Section 302.105 Antidegradation

The purpose of this Section is to protect existing uses of all waters of the State of Illinois, maintain the quality of waters with quality that is better than water quality standards, and 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) 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) Utilize 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 pursuant to 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);
- 3) Response actions pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, corrective actions, pursuant to 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) Changes to or inclusion of 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 Section 302.521 of this Part.

f) Antidegradation Assessments

In conducting an antidegradation assessment pursuant to 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) Expansion to provide service for anticipated residential or industrial growth consistent with a community's long range urban planning;
  - iii) Addition of a new product line or production increase or modification at an industrial facility; or
  - iv) An increase or the retention of current employment levels at a facility.
- D) Assessments of alternatives to proposed increases in pollutant loading or activities subject to Agency certification pursuant to 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 accordance with the provisions of this Section on a case-by-case basis.
  - A) The Agency must consider the criteria stated in Section 302.105(c)(2).
  - B) The Agency must consider the information provided by the applicant pursuant to 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 \_\_ Ill. Reg.\_\_\_\_, effective \_\_\_\_\_)

## SUBPART B: GENERAL USE WATER QUALITY STANDARDS

### Section 302.202 Purpose

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 \_\_ Ill. Reg.\_\_\_\_, effective \_\_\_\_\_)

### Section 302.204 pH

pH(~~STORET number 00400~~) shall be within the range of 6.5 to 9.0 except for natural causes.

(Source: Amended at \_\_ Ill. Reg.\_\_\_\_, effective \_\_\_\_\_)

### Section 302.205 Phosphorus

Phosphorus (~~STORET number 00665~~): After December 31, 1983, Phosphorus as P shall not exceed 0.05 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 the purposes of this Section, the term "reservoir or lake" 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 Section 304.123 shall be in compliance with this Section for purposes of application of Section 304.105.

(Source: Amended at \_\_ Ill. Reg.\_\_\_\_, effective \_\_\_\_\_)

### **Section 302.207 Radioactivity**

- a) Gross beta (~~STORET number 03501~~) concentration shall not exceed 100 picocuries per liter (pCi/L).
- 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 \_\_ Ill. Reg.\_\_\_\_, effective \_\_\_\_\_)

### **Section 302.208 Numeric Standards for Chemical Constituents**

- a) The acute standard (AS) for the chemical constituents listed in subsection (e) 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 pursuant to Section 302.102.
- b) The chronic standard (CS) for the chemical constituents listed in subsection (e) 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 pursuant to Section 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) shall not be exceeded when the stream flow is at or above the harmonic mean flow pursuant to Section 302.658 nor shall 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 pursuant to Section 302.102.

- d) The standard for the chemical constituents of subsections (g) and (h) 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 pursuant to Section 302.102.
- e) Numeric Water Quality Standards for the Protection of Aquatic Organisms

Constituent	AS (µg/L)	CS (µg/L)
Arsenic (trivalent, dissolved)	$360 \times 1.0^* = 360$	$190 \times 1.0^* = 190$
Boron (total)	40,100	7,600
Cadmium (dissolved)	$e^{A+B \ln(H)} \times \left\{ 1.138672 - \frac{1.138672}{[(\ln(H))(0.041838)]} \right\}^*$ where $A = -2.918$ and $B = 1.128$	$e^{A+B \ln(H)} \times \left\{ 1.101672 - \frac{1.101672}{[(\ln(H))(0.041838)]} \right\}^*$ 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	$e^{A+B \ln(H)}$ , but shall not exceed 4.0 mg/L where $A = 6.0445$ and



	$B = 0.5394$	$B = 0.5394$
Lead (dissolved)	$e^{A+B \ln(H)} \times$ $\{1.46203 -$ $[(\ln(H))(0.145712)]\}^*$	$e^{A+B \ln(H)} \times$ $\{1.46203 -$ $[(\ln(H))(0.145712)]\}^*$
	where $A = -1.301$ and $B = 1.273$	where $A = -2.863$ and $B = 1.273$
Manganese (dissolved)	$e^{A+B \ln(H)} \times 0.9812^*$	$e^{A+B \ln(H)} \times 0.9812^*$
	where $A = 4.9187$ and $B = 0.7467$	where $A = 4.0635$ and $B = 0.7467$
Mercury (dissolved)	$2.6 \times 0.85^* = 2.2$	$1.3 \times 0.85^* = 1.1$
Nickel (dissolved)	$e^{A+B \ln(H)} \times 0.998^*$	$e^{A+B \ln(H)} \times 0.997^*$
	where $A = 0.5173$ and $B = 0.8460$	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:

$\mu\text{g/L}$  = microgram per liter

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

$\ln(H)$  = natural logarithm of Hardness (in mg/L as  $\text{CaCO}_3$ )

- \* = 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	( $\mu\text{g/L}$ )
Mercury (total)	0.012
Benzene	310

where:

$\mu\text{g/L}$  = 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)	$\mu\text{g/L}$		5.0

where:

mg/L = milligram per liter and

$\mu\text{g/L}$  = 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<sub>3</sub>) 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:

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

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:

$$C = [-57.478 + 5.79 (\text{hardness}) + 54.163 (\text{chloride})] * 0.65$$

where:

C = sulfate concentration

- 3) The following sulfate standards must be met at all times when hardness (in mg/L as CaCO<sub>3</sub>) 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 pursuant to section 303(c) of the Federal Water Pollution Control Act of 1972 (Clean Water Act), 33 USC 1313, and Federal Regulations at 40 CFR 131.10(j)(2).

(Source: Amended at \_\_ 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~~) shall 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 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 shall apply this rule pursuant to 35 Ill. Adm. Code 304.121.

(Source: Amended at \_\_ Ill. Reg. \_\_\_\_, effective \_\_\_\_\_)

### **Section 302.210 Other Toxic Substances**

Waters of the State shall be free from any substances or combination of substances in concentrations toxic or harmful to human health, or to animal, plant or aquatic life. Individual chemical substances or parameters for which numeric standards are specified in this Subpart are not subject to this Section.

- a) Any substance or combination of substances 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 pursuant to procedures set forth in Sections 302.612 through 302.618 or in Section 302.621; or
  - 2) A Chronic Aquatic Toxicity Criterion (CATC) validly derived and correctly applied pursuant to procedures set forth in Sections 302.627 or 302.630.
- b) Any substance or combination of substances 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 pursuant to Section 302.633.
- c) Any substance or combination of substances 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 pursuant to Sections 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 pursuant to Sections 302.651 through 302.658 (Human Nonthreshold Criterion).
- d) The most stringent criterion of subsections (a), (b), and (c) shall apply at all points outside of any waters within which, mixing is allowed pursuant to Section 302.102. In addition, the AATC derived pursuant to subsection (a)(1) shall apply in all waters except that it shall not apply within a ZID that is prescribed in accordance with Section 302.102.
- e) The procedures of Subpart F set forth minimum data requirements, appropriate test protocols and data assessment methods for establishing criteria 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 pursuant to Title VII of the Act. The validity and applicability of the Subpart F procedures may not be challenged in any proceeding brought pursuant to Titles VIII or X of the Act, although the validity and correctness of application of the numeric criteria derived pursuant to Subpart F may be challenged in such proceedings 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 pursuant to this Section only at the time such criterion is first applied in an NPDES permit pursuant to 35 Ill. Adm. Code 309.152 or in an action 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 shall 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 pursuant to 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 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 pursuant to the following conditions:
- 1) Application shall be made in strict accordance with label directions;
  - 2) Applicator 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 accordance 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) No aquatic pesticide 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 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 \_\_ Ill. Reg.\_\_\_\_\_, effective \_\_\_\_\_)

**Section 302.211 Temperature**

- a) ~~Temperature has STORET number (F°) 00011 and (C°) 00010.~~
- b) There shall be no abnormal temperature changes that may adversely affect aquatic life unless caused by natural conditions.
- b)e) The normal daily and seasonal temperature fluctuations which existed before the addition of heat due to other than natural causes shall be maintained.
- c)d) The maximum temperature rise above natural temperatures shall not exceed 2.8° C (5° F).
- d)e) In addition, the water temperature at representative locations in the main river 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 exceed the maximum limits in the following table by more than 1.7° C (3° F).

	° C	° F		° C	° F
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 shall demonstrate in a hearing before this Pollution Control Board (Board) not less than 5 nor more than 6 years after the effective date of these regulations or, 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 such proof is not made to the satisfaction of the Board appropriate corrective measures shall be ordered to be taken 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), 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 shall maintain such records and conduct such studies of the effluents from 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).

~~h)i)~~ Appropriate corrective measures will be required if, upon complaint filed in accordance 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 (b) through (e).
- 2) The heated effluent discharged to the artificial cooling lake complies with all other applicable provisions of this Chapter, except subsections (b) through (e).
- 3) At an adjudicative hearing the discharger 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) provision of conditions capable of supporting shellfish, fish and wildlife, and recreational uses consistent with good management practices, and
  - B) control of the thermal component of the discharger's effluent by a technologically feasible and economically reasonable method.
- 4) The required showing 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 showing

pursuant to 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 an adequate showing as provided in subsection (j)(3) is found, the Board shall promulgate specific thermal standards to be applied to the discharge to that artificial cooling Lake.

(Source: Amended at \_\_ 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:

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

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

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

- ii) When water temperature is above 14.51°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

- B) During the Early Life Stage Absent period, as defined in subsection (e) of this Section:

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

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

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

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

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 pursuant to Section 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 pursuant to Section 302.102 of this Part. Attainment of the chronic standard (CS) is evaluated pursuant to 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) 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 pursuant to Section 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 \_\_ Ill. Reg.\_\_\_\_, effective \_\_\_\_\_)

## **SUBPART C: PUBLIC AND FOOD PROCESSING WATER SUPPLY STANDARDS**

### **Section 302.306 Fecal Coliform**

Notwithstanding the provisions of Section 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 \_\_ 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 \_\_ Ill. Reg.\_\_\_\_, effective \_\_\_\_\_)

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

### **Section 302.407 Chemical Constituents**

- a) The acute standard (AS) for the chemical constituents listed in subsection (e) 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) 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) 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 pursuant to Section 302.102 of this Part, the following apply:
  - 1) The AS shall not be exceeded in any waters except for those waters for which a zone of initial dilution (ZID) applies pursuant to Section 302.102 of this Part.
  - 2) The CS shall not be exceeded outside of waters in which mixing is allowed pursuant to Section 302.102 of this Part.
  - 3) The HHS shall not be exceeded outside of waters in which mixing is allowed pursuant to Section 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)	$e^{A+B \ln(H)} \times \{1.138672 - [(\ln(H))(0.041838)]\}^*$ , where A=-2.918 and B=1.128	$e^{A+B \ln(H)} \times \{1.101672 - [(\ln(H))(0.041838)]\}^*$ , 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=3.7256 and B=0.8190	$e^{A+B \ln(H)} \times 0.860^*$ , where A=0.6848 and B=0.8190
Copper (dissolved)	$e^{A+B \ln(H)} \times 0.960^*$ , where A=-1.645 and	$e^{A+B \ln(H)} \times 0.960^*$ , where A=-1.646 and

	B=0.9422	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 shall not exceed 4.0 mg/L where $A = 6.0445$ and $B = 0.5394$
Lead (dissolved)	$e^{A+B \ln(H)} \times \{1.46203 - [(\ln(H))(0.145712)]\}^*$ , where $A = -1.301$ and $B = 1.273$	$e^{A+B \ln(H)} \times \{1.46203 - [(\ln(H))(0.145712)]\}^*$ , 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)	$1.4 \times 0.85^* = 1.2$	$0.77 \times 0.85^* = 0.65$
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 $B = 0.8460$
Toluene	2000	600
TRC	19	11
Xylene(s)	920	360
Zinc (dissolved)	$e^{A+B \ln(H)} \times 0.978^*$ , where $A = 0.9035$ and $B = 0.8473$	$e^{A+B \ln(H)} \times 0.986^*$ , where $A = -0.4456$ and $B = 0.8473$

where:

$\mu\text{g/L}$  = microgram per liter,

H = Hardness concentration of receiving water in mg/L as  $\text{CaCO}_3$ ,

$e^x$  = 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, 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).

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

Constituent	HHS in micrograms per liter ( $\mu\text{g/L}$ )
Benzene	310
Mercury (total)	0.012
Phenols	860,000

where:

$\mu\text{g/L}$  = microgram per liter.

g) Numeric Water Quality Standards for Other Chemical Constituents

- 1) Concentrations of the following chemical constituents shall not be exceeded except in waters for which mixing is allowed pursuant to Section 302.102 of this Part.

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

where:

mg/L = milligram per liter,

$\mu\text{g/L}$  = microgram per liter,

H = Hardness concentration of receiving water in mg/L as  $\text{CaCO}_3$ ,

C = Chloride concentration of receiving water in mg/L,

$\exp^x$  = 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 shall not be exceeded except in waters for which mixing is allowed pursuant to Section 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) 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 shall not be exceeded except in waters for which mixing is allowed pursuant to Section 302.102 of this Part:

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) shall not exceed the following standards:

CONSTITUENT	<del>STOREF</del> NUMBER	CONCENTRATION (mg/L)
Ammonia Un-ionized (as N*)	<del>00612</del>	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 shall be computed according to the following equation:

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

where:

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

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 shall 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 \_\_ 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~~) shall not exceed 34° C (93° F) more than 5% of the time, or 37.8° C (100° F) 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 will not exceed temperature (~~STORET number (°F) 00011 and (°C) 00010~~) of 34°C (93°F) more than 5% of the time, or 37.8° C (100° F) at any time.
- c) There 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 shall be maintained.
- e) The maximum temperature rise above natural temperatures shall not exceed 2.8° C (5° F).
- f) Water temperature at representative locations in the main river 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 water temperature 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 shall not exceed the limits in the following table in accordance with subsection (f):

Months	Daily Maximum (°F)

January	60
February	60
March	60
April	90
May	90
June	90
July	90
August	90
September	90
October	90
November	90
December	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, shall not exceed the limits in the following table in accordance with subsection (f):

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

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

Months	Daily Maximum (°F)
January	60
February	60
March	60

April		90
May		90
June		90
July		90
August		90
September		90
October		90
November		90
December		60

(Source: Amended at \_\_ 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 Section 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 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 accordance with the methodology in Section 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 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  $\mu\text{m}$  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<sub>1</sub>\*” 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<sub>a</sub>" 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<sub>c</sub>" 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 \_\_ 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 Section 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 \_\_ 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 Section 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 \_\_ Ill. Reg. \_\_\_\_, effective \_\_\_\_\_)

**Section 302.504 Chemical Constituents**

The following concentrations of chemical constituents must not be exceeded, except as provided in Sections 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) pursuant to Sections 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 pursuant to Sections 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.

<u>Constituent</u>	<u>Unit</u>	<u>AS</u>	<u>CS</u>	<u>HHS</u>
Arsenic (Trivalent, dissolved)	µg/L	$340 \times 1.0^* = 340$	$\frac{340 \times 1.0^*}{148 \times 1.0^*} = 148$	NA
Boron (total)	mg/L	40.1	7.6	NA
Cadmium (dissolved)	µg/L	$\exp[A + B \ln(H)] \times \{1.138672 - [(\ln H) (0.041838)]\}^*$	$\exp[A + B \ln(H)] \times \{1.101672 - [(\ln H) (0.041838)]\}^*$	NA

		where $A = -3.6867$ and $B = 1.128$	where $A = -2.715$ and $B = 0.7852$	
Chromium (Hexavalent, total)	$\mu\text{g/L}$	16	11	NA
Chromium (Trivalent, dissolved)	$\mu\text{g/L}$	$\exp[A + B \ln(H)] \times$ $0.316^*$	$\exp[A + B \ln(H)] \times$ $0.860^*$	NA
		where $A = 3.7256$ and $B = 0.819$	where $A = 0.6848$ and $B = 0.819$	
Copper (dissolved)	$\mu\text{g/L}$	$\exp[A + B \ln(H)] \times$ $0.960^*$	$\exp[A + B \ln(H)] \times$ $0.960^*$	NA
		where $A = -1.700$ and $B = 0.9422$	where $A = -1.702$ and $B = 0.8545$	
Cyanide**	$\mu\text{g/L}$	22	5.2	NA
Fluoride (total)	$\mu\text{g/L}$	$\exp[A + B \ln(H)]$  where $A = 6.7319$ and $B = 0.5394$	$\exp[A + B \ln(H)]$ , but shall not exceed 4.0 mg/L  where $A = 6.0445$ and $B = 0.5394$	NA
Lead (dissolved)	$\mu\text{g/L}$	$\exp[A + B \ln(H)] \times$ $\{1.46203 - [(\ln H)$ $(0.145712)]\}^*$	$\exp[A + B \ln(H)] \times$ $\{1.46203 - [(\ln H)$ $(0.145712)]\}^*$	NA
		where $A = -1.055$ and $B = 1.273$	where $A = -4.003$ and $B = 1.273$	
Manganese (dissolved)	$\mu\text{g/L}$	$\exp[A + B \ln(H)] \times$ $0.9812^*$	$\exp[A + B \ln(H)] \times$ $0.9812^*$	NA
		where $A = 4.9187$ and $B = 0.7467$	where $A = 4.0635$ and $B = 0.7467$	
Nickel (dissolved)	$\mu\text{g/L}$	$\exp[A + B \ln(H)] \times$ $0.998^*$	$\exp[A + B \ln(H)] \times$ $0.997^*$	NA



		where $A = 2.255$ and $B = 0.846$	where $A = 0.0584$ and $B = 0.846$	
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*	$\exp[A + B \ln(H)] \times$ 0.986*	NA
		where $A = 0.884$ and $B = 0.8473$	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	$\exp B([pH] + A)$	$\exp B([pH] + A)$	NA
		where $A = -4.869$ and $B = 1.005$	where $A = -5.134$ and $B = 1.005$	
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

\* = 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 ~~301.106302.510~~ 301.106302.510: 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 Sections 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 \_\_ 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 Section 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 \_\_ Ill. Reg.\_\_\_\_, effective \_\_\_\_\_)

### Section 302.506 Temperature

- a) ~~STORET numbers for temperature are (oF) 00011 and (oC) 00010.~~
- b) The owner or operator of a source of heated effluent shall maintain such records and conduct such studies of the effluents from such source and of their effects as may be required by the Agency or in any permit granted under the Act.
- b)e) Backfitting of alternative cooling facilities will be required if, upon complaint filed in accordance with Board rules, it is found at any time that any heated effluent causes significant ecological damage to the Lake.

(Source: Amended at \_\_ Ill. Reg.\_\_\_\_, effective \_\_\_\_\_)

### Section 302.510 Incorporations by Reference (Repealed)

- a) ~~The Board incorporates the following publications by reference:~~

~~American Public Health Association et al., Standard Methods for the Examination of Water and Wastewater, 21<sup>st</sup> 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-~~

- e) ~~This Section incorporates no future editions or amendments.~~

(Source: Repealed at \_\_ Ill. Reg.\_\_\_\_, effective \_\_\_\_\_)

### Section 302.525 Radioactivity

Except as provided in Section 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) Strontium 90 (~~STORET number 13501~~) concentration 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 \_\_ Ill. Reg.\_\_\_\_, effective \_\_\_\_\_)

### Section 302.535 Ammonia Nitrogen

The Open Waters of Lake Michigan as defined in Section 302.501 must not exceed 0.02 mg/L total ammonia (as-N; ~~STORET Number 00610~~). The remaining waters of the Lake Michigan Basin shall be 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 Sections 302.208(a) and (b) of this Part:
  - 1) From April through October, the Acute Standard (AS) shall be 0.33 mg/L and the chronic standard (CS) shall be 0.057 mg/L.
  - 2) From November through March, the AS shall be 0.14 mg/L and the CS shall 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 shall be computed according to the following equations:

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

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

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

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 \_\_ 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 Section 302.504 are not subject to recalculation by this Section, however, where no standard is applied for a category, a numeric value may be calculated herein.

- a) Any substance shall 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 pursuant to procedures set forth in Sections 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 pursuant to procedures set forth in Section 302.565 as an average of four samples collected on four different days.
  
- b) Any combination of substances, including effluents, shall be deemed toxic to aquatic life if present in concentrations that exceed either subsection (b)(1) or (2) of this Section:
  - 1) No sample of water from the Lake Michigan Basin collected outside of a designated zone of initial dilution shall exceed 0.3 TU<sub>a</sub> as determined for the most sensitive species tested using acute toxicity testing methods.
  - 2) No sample of water from the Lake Michigan Basin collected outside a designated mixing zone shall exceed 1.0 TU<sub>c</sub> 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 will be tested. The rainbow trout will be used to represent fishes for the Open Waters of Lake Michigan and the fathead minnow will represent fishes for the other waters of the Lake Michigan Basin. Ceriodaphnia will represent invertebrates for all waters of the Lake Michigan Basin. Other common species shall be used if listed in Table I (a)A of 40 CFR 136, incorporated by reference at Section 35 Ill. Adm. Code 301.106~~Section 302.510~~, and approved by the Agency.
- c) Any substance shall be deemed toxic or harmful to wildlife if present in concentrations that exceed a Tier I Lake Michigan Basin Wildlife Criterion (LMWLC) derived pursuant to procedures set forth in Section 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 shall be applicable to only the Open Waters of Lake Michigan. For any substance that is determined to be a BCC, the resulting criterion shall apply in the entire Lake Michigan Basin. These substances shall 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 pursuant to procedures set forth in Section 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 pursuant to procedures set forth in Section 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 pursuant to Section 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 pursuant to 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 pursuant to Title VII of

the Act. The validity and applicability of these procedures may not be challenged in any proceeding brought pursuant to Title VIII or X of the Act, although the validity and correctness of application of the numeric criteria or values derived pursuant to this Subpart may be challenged in such proceedings pursuant to 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 pursuant to this Section only at the time such criterion or value is first applied in its NPDES permit pursuant to 35 Ill. Adm. Code 309.152 or in an action 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 or value at the time of its first application to that person's facility shall constitute a waiver of 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 pursuant to 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 such action shall have 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 pursuant to the following conditions:
  - 1) Application shall be made in strict accordance with label directions;
  - 2) Applicator 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 accordance with the laws, regulations and guidelines of all State and federal agencies authorized by law to regulate, use or supervise pesticide applications;
- 4) No aquatic pesticide 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 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 \_\_ Ill. Reg.\_\_\_\_, effective \_\_\_\_\_)

### **Section 302.545 Data Requirements**

The Agency shall 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 301.106Section-302.540, or recommended in 40 CFR 132, and incorporated by reference in 35 Ill. Adm. Code 301.106Section-302.540.

(Source: Amended at \_\_ 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 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 Section 35 Ill. Adm. Code 301.106Section-302.540, or recommended in 40 CFR 132, and incorporated by reference in 35 Ill. Adm. Code 301.106Section-302.540.

(Source: Amended at \_\_ 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 shall be either measured or reliably estimated.
- 4) Predicted BCF.  
Predicted baseline BCF =  $K_{ow}$ .

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) ( $\mu\text{g/g}$ )

$f_l$  = fraction of the tissue that is lipid

B) Bioavailability.

The fraction of the total chemical in the ambient water that is freely dissolved,  $f_{fd}$ , shall be calculated using the following equation:

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

Where:

DOC = concentration of dissolved organic carbon, kg of dissolved organic carbon/L of water

$K_{ow}$  = 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 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:

$$\text{Baseline BAF} = \{ [\text{measured BAF}_{\text{fT}} / f_{\text{fd}}] - 1 \} \{ 1 / f_{\text{i}} \}$$

Where:

$\text{BAF}_{\text{fT}}$  = BAF based on total concentration in tissue and water of study organism and site

$f_{\text{i}}$  = fraction of the tissue of study organism that is lipid

$f_{\text{fd}}$  = fraction of the total chemical that is freely dissolved in the ambient water

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

(Baseline BAF)<sub>i</sub> =

$$(\text{baseline BAF})_{\text{r}} (\text{BSAF})_{\text{i}} (\text{Kow})_{\text{i}} / (\text{BSAF})_{\text{r}} (\text{Kow})_{\text{r}}$$

Where:

(BSAF)<sub>i</sub> = BSAF for chemical "i"

(BSAF)<sub>r</sub> = BSAF for the reference chemical "r"

(Kow)<sub>i</sub> = octanol-water partition coefficient for chemical "i"

(Kow)<sub>r</sub> = octanol-water partition coefficient for the reference chemical "r"

- i) A BSAF shall be calculated using the following equation:

$$\text{BSAF} = C_{\text{l}} / C_{\text{soc}}$$

Where:

$C_{\text{l}}$  = the lipid-normalized concentration of the chemical in tissue

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

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

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

Where:

$C_s$  = concentration of chemical in sediment ( $\mu\text{g/g}$  sediment)  
 $f_{oc}$  = fraction of the sediment that is organic carbon

- C) From a laboratory-measured BCF:

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

Where:

$\text{BCF}_{fT}$  = 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, Appendix B, incorporated by reference at 35 Ill. Adm. Code 301.106~~Section 302.540~~, by linear interpolation for trophic level 3 or 4, as necessary

- D) From a predicted BCF:

$$\text{baseline BAF} = (\text{FCM}) (\text{predicted baseline BCF}) = (\text{FCM})(Kow)$$

Where:

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 301.106~~Section 302.540~~, 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 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 shall be calculated using the following equations:

- A) For trophic level 3:

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

- B) For trophic level 4:

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

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 shall be calculated using the following equations:

- A) For trophic level 3:

$$\text{Wildlife BAF}_{\text{WLT3}} = [(\text{baseline BAF})(0.0646) + 1] (f_{fd})$$

- B) For trophic level 4:

$$\text{Wildlife BAF}_{\text{WLT4}} = [(\text{baseline BAF})(0.1031) + 1] (f_{fd})$$

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 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 shall be based on concentration in the whole body of freshwater fish and invertebrates.

(Source: Amended at \_\_ 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 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 ( $UF_1$ ). For those substances for which a LOAEL has been derived, the  $UF_1$  shall 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  $UF_s$  shall not be less than one and should not exceed 10.
    - D) Correction for interspecies extrapolations ( $UF_a$ ). For the derivation of criteria, a  $UF_a$  shall not be less than one and should not exceed 100. The  $UF_a$  shall be used only for extrapolating toxicity data across species within a taxonomic class. A species specific  $UF_a$  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:

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

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<sub>a</sub> = the uncertainty factor for extrapolating toxicity data across species (unitless). A species-specific UF<sub>a</sub> shall be selected and applied to each target species, consistent with the equation.

UF<sub>s</sub> = the uncertainty factor for extrapolating from subchronic to chronic exposures (unitless).

UF<sub>l</sub> = the uncertainty factor for extrapolation from LOAEL to NOAEL (unitless)

W<sub>t</sub> = 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<sub>TLi</sub> = average daily amount of food consumed by the target species in kilograms (kg/d) for trophic level i.

BAF<sub>WLTLi</sub> = aquatic life bioaccumulation factor with units of liter per kilogram (L/kg), as derived from Section 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 \_\_\_ 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 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<sup>-5</sup>) 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 302.540~~.
- 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 Section 301.106 or scientifically justified equivalents). The upper-bound 95 percent confidence limit on risk at the 1 in 100,000 risk level shall be used to calculate a risk associated dose (RAD); and

- 2) A species scaling factor 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 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 ( $1 \times 10^{-5}$ ) = incremental risk of developing cancer equal to 1 in 100,000

$q_1^*$  = slope factor (mg/kg/day)<sup>-1</sup>

- 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

$FC_{TL3}$  = 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 Section 302.570

(Source: Amended at \_\_ Ill. Reg. \_\_\_\_, effective \_\_\_\_\_)

## SUBPART F: PROCEDURES FOR DETERMINING WATER QUALITY CRITERIA

### Section 302.606 Data Requirements

The Agency 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", incorporated by reference in 35 Ill. Adm. Code 301.106 or approved by the American Society for Testing and Materials incorporated by reference in 35 Ill. Adm. Code 301.106.

(Source: Amended at \_\_ 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 Sections 302.615 and ~~302.618~~~~302.684~~ 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 Section 302.615 must be used to obtain an AATC for individual substances whose toxicity is unaffected by ambient water quality characteristics. The procedures of Section 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 Section 302.615, by 10.

(Source: Amended at \_\_ Ill. Reg.\_\_\_\_, effective \_\_\_\_\_)