

POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

- 1) Heading of the Part: Water Quality Standards
- 2) Code Citation: 35 Ill. Adm. Code 302
- 3)

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

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302.510	Repealed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

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302.Appendix A	Repealed
302.Appendix B	Repealed

- 4) Statutory Authority: Implementing Section 13 and authorized by Sections 11(b) and 27 of the Environmental Protection Act [415 ILCS 5/13, 11(b), and 27].
- 5) A Complete Description of the Subjects and Issues Involved: In 2016, the Board began reviewing its rules to identify obsolete, repetitive, confusing, or otherwise unnecessary language. On January 10, 2018, the Illinois Environmental Protection Agency (IEPA) filed a proposal to update provisions including Part 302. IEPA's proposal arose from Executive Order 2016-13, which required agencies to identify outdated, repetitive, confusing, or unnecessary rules and then amend or repeal them. These proposed amendments to Part 302 include those submitted by IEPA and those identified separately by the Board. Both IEPA and the Board intend the amendments to be non-substantive clarifications.
- 6) Published studies or reports, and sources of underlying data, used to compose this rulemaking: No
- 7) Will this proposed rulemaking replace an emergency rule currently in effect? No
- 8) Does this rulemaking contain an automatic repeal date? No
- 9) Does this proposed rulemaking contain incorporations by reference? No
- 10) Are there any proposed rulemakings to this Part pending? No
- 11) Statement of Statewide Policy Objectives: This proposed amendment does not create or enlarge a State mandate as defined in Section 3(b) of the State Mandates Act. [30 ILCS 805/3].

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

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

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

- 13) Initial Regulatory Flexibility Analysis:
- A) Types of small businesses, small municipalities and not for profit corporations affected: None
 - B) Reporting, bookkeeping or other procedures required for compliance: None
 - C) Types of Professional skills necessary for compliance: None
- 14) Small Business Impact Analysis: The Board expects that this rulemaking will not have an adverse impact on small business.
- 15) Regulatory Agenda on which this rulemaking was summarized: January 2022

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

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

4
5 PART 302
6 WATER QUALITY STANDARDS

7
8 SUBPART A: GENERAL WATER QUALITY PROVISIONS
9

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12	302.101	Scope and Applicability
13	302.102	Allowed Mixing, Mixing Zones and ZIDs
14	302.103	Stream Flows
15	302.104	Main River Temperatures
16	302.105	Antidegradation

17
18 SUBPART B: GENERAL USE WATER QUALITY STANDARDS
19

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21	302.201	Scope and Applicability
22	302.202	Purpose
23	302.203	Offensive Conditions
24	302.204	pH
25	302.205	Phosphorus
26	302.206	Dissolved Oxygen
27	302.207	Radioactivity
28	302.208	Numeric Standards for Chemical Constituents
29	302.209	Fecal Coliform
30	302.210	Other Toxic Substances
31	302.211	Temperature
32	302.212	Total Ammonia Nitrogen
33	302.213	Effluent Modified Waters (Ammonia) (Repealed)

34
35 SUBPART C: PUBLIC AND FOOD PROCESSING WATER SUPPLY STANDARDS
36

37	Section	
38	302.301	Scope and Applicability
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41	302.304	Chemical Constituents
42	302.305	Other Contaminants
43	302.306	Fecal Coliform
44	302.307	Radium 226 and 228

45
46 SUBPART D: CHICAGO AREA WATERWAY SYSTEM AND
47 LOWER DES PLAINES RIVER WATER QUALITY AND
48 INDIGENOUS AQUATIC LIFE STANDARDS
49
50 Section
51 302.401 Scope and Applicability
52 302.402 Purpose
53 302.403 Unnatural Sludge
54 302.404 pH
55 302.405 Dissolved Oxygen
56 302.406 Fecal Coliform (Repealed)
57 302.407 Chemical Constituents
58 302.408 Temperature
59 302.409 Cyanide for the South Fork of the South Branch of the Chicago River (Bubbly
60 Creek)
61 302.410 Other Toxic Substances
62 302.412 Total Ammonia Nitrogen

63
64 SUBPART E: LAKE MICHIGAN BASIN WATER QUALITY STANDARDS
65

66 Section
67 302.501 Scope, Applicability, and Definitions
68 302.502 Dissolved Oxygen
69 302.503 pH
70 302.504 Chemical Constituents
71 302.505 Fecal Coliform
72 302.506 Temperature
73 302.507 Thermal Standards for Existing Sources on January 1, 1971
74 302.508 Thermal Standards for Sources Under Construction But Not In Operation on
75 January 1, 1971
76 302.509 Other Sources
77 302.510 Incorporations by Reference (Repealed)
78 302.515 Offensive Conditions
79 302.520 Regulation and Designation of Bioaccumulative Chemicals of Concern (BCCs)
80 302.521 Supplemental Antidegradation Provisions for Bioaccumulative Chemicals of
81 Concern (BCCs)
82 302.525 Radioactivity
83 302.530 Supplemental Mixing Provisions for Bioaccumulative Chemicals of Concern
84 (BCCs)
85 302.535 Ammonia Nitrogen
86 302.540 Other Toxic Substances
87 302.545 Data Requirements
88 302.550 Analytical Testing

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89	302.553	Determining the Lake Michigan Aquatic Toxicity Criteria or Values – General
90		Procedures
91	302.555	Determining the Tier I Lake Michigan Acute Aquatic Toxicity Criterion
92		(LMAATC): Independent of Water Chemistry
93	302.560	Determining the Tier I Lake Michigan Basin Acute Aquatic Life Toxicity
94		Criterion (LMAATC): Dependent on Water Chemistry
95	302.563	Determining the Tier II Lake Michigan Basin Acute Aquatic Life Toxicity Value
96		(LMAATV)
97	302.565	Determining the Lake Michigan Basin Chronic Aquatic Life Toxicity Criterion
98		(LMCATC) or the Lake Michigan Basin Chronic Aquatic Life Toxicity Value
99		(LMCATV)
100	302.570	Procedures for Deriving Bioaccumulation Factors for the Lake Michigan Basin
101	302.575	Procedures for Deriving Tier I Water Quality Criteria and Values in the Lake
102		Michigan Basin to Protect Wildlife
103	302.580	Procedures for Deriving Water Quality Criteria and Values in the Lake Michigan
104		Basin to Protect Human Health – General
105	302.585	Procedures for Determining the Lake Michigan Basin Human Health Threshold
106		Criterion (LMHHTC) and the Lake Michigan Basin Human Health Threshold
107		Value (LMHHTV)
108	302.590	Procedures for Determining the Lake Michigan Basin Human Health
109		Nonthreshold Criterion (LMHHNC) or the Lake Michigan Basin Human Health
110		Nonthreshold Value (LMHHNV)
111	302.595	Listing of Bioaccumulative Chemicals of Concern, Derived Criteria and Values

SUBPART F: PROCEDURES FOR DETERMINING WATER QUALITY CRITERIA

115	Section	
116	302.601	Scope and Applicability
117	302.603	Definitions
118	302.604	Mathematical Abbreviations
119	302.606	Data Requirements
120	302.612	Determining the Acute Aquatic Toxicity Criterion for an Individual Substance –
121		General Procedures
122	302.615	Determining the Acute Aquatic Toxicity Criterion – Toxicity Independent of
123		Water Chemistry
124	302.618	Determining the Acute Aquatic Toxicity Criterion – Toxicity Dependent on Water
125		Chemistry
126	302.621	Determining the Acute Aquatic Toxicity Criterion – Procedure for Combinations
127		of Substances
128	302.627	Determining the Chronic Aquatic Toxicity Criterion for an Individual Substance –
129		General Procedures
130	302.630	Determining the Chronic Aquatic Toxicity Criterion – Procedure for
131		Combinations of Substances
132	302.633	The Wild and Domestic Animal Protection Criterion

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133	302.642	The Human Threshold Criterion
134	302.645	Determining the Acceptable Daily Intake
135	302.648	Determining the Human Threshold Criterion
136	302.651	The Human Nonthreshold Criterion
137	302.654	Determining the Risk Associated Intake
138	302.657	Determining the Human Nonthreshold Criterion
139	302.658	Stream Flow for Application of Human Nonthreshold Criterion
140	302.660	Bioconcentration Factor
141	302.663	Determination of Bioconcentration Factor
142	302.666	Utilizing the Bioconcentration Factor
143	302.669	Listing of Derived Criteria
144		
145	302.APPENDIX A	References to Previous Rules (Repealed)
146	302.APPENDIX B	Sources of Codified Sections (Repealed)
147	302.APPENDIX C	Maximum total ammonia nitrogen concentrations allowable for certain
148		combinations of pH and temperature
149	302.TABLE A	pH-Dependent Values of the AS (Acute Standard)
150	302.TABLE B	Temperature and pH-Dependent Values of the CS (Chronic
151		Standard) for Fish Early Life Stages Absent
152	302.TABLE C	Temperature and pH-Dependent Values of the CS (Chronic
153		Standard) for Fish Early Life Stages Present
154	302.APPENDIX D	Section 302.206(d): Stream Segments for Enhanced Dissolved Oxygen
155		Protection
156		

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

159
160 SOURCE: Filed with the Secretary of State January 1, 1978; amended at 2 Ill. Reg. 44, p. 151,
161 effective November 2, 1978; amended at 3 Ill. Reg. 20, p. 95, effective May 17, 1979; amended
162 at 3 Ill. Reg. 25, p. 190, effective June 21, 1979; codified at 6 Ill. Reg. 7818; amended at 6 Ill.
163 Reg. 11161, effective September 7, 1982; amended at 6 Ill. Reg. 13750, effective October 26,
164 1982; amended at 8 Ill. Reg. 1629, effective January 18, 1984; peremptory amendments at 10 Ill.
165 Reg. 461, effective December 23, 1985; amended at R87-27 at 12 Ill. Reg. 9911, effective May
166 27, 1988; amended at R85-29 at 12 Ill. Reg. 12082, effective July 11, 1988; amended in R88-1 at
167 13 Ill. Reg. 5998, effective April 18, 1989; amended in R88-21(A) at 14 Ill. Reg. 2899, effective
168 February 13, 1990; amended in R88-21(B) at 14 Ill. Reg. 11974, effective July 9, 1990; amended
169 in R94-1(A) at 20 Ill. Reg. 7682, effective May 24, 1996; amended in R94-1(B) at 21 Ill. Reg.
170 370, effective December 23, 1996; expedited correction at 21 Ill. Reg. 6273, effective December
171 23, 1996; amended in R97-25 at 22 Ill. Reg. 1356, effective December 24, 1997; amended in
172 R99-8 at 23 Ill. Reg. 11249, effective August 26, 1999; amended in R01-13 at 26 Ill. Reg. 3505,
173 effective February 22, 2002; amended in R02-19 at 26 Ill. Reg. 16931, effective November 8,
174 2002; amended in R02-11 at 27 Ill. Reg. 166, effective December 20, 2002; amended in R04-21
175 at 30 Ill. Reg. 4919, effective March 1, 2006; amended in R04-25 at 32 Ill. Reg. 2254, effective
176 January 28, 2008; amended in R07-9 at 32 Ill. Reg. 14978, effective September 8, 2008;

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

180
181 SUBPART A: GENERAL WATER QUALITY PROVISIONS

182
183 **Section 302.100 Definitions**

184
185 Unless otherwise specified, the definitions of the Environmental Protection Act (Act) [415 ILCS
186 5] and 35 Ill. Adm. Code 301 apply to this Part. As used in this Part, each of the following
187 definitions has the specified meaning.

188
189 "Acute Toxicity" means the capacity of any substance or combination of
190 substances to cause mortality or other adverse effects in an organism resulting
191 from a single or short-term exposure to the substance.

192
193 "Adverse Effect" means any gross or overt effect on an organism, including but
194 not limited to reversible histopathological damage, severe convulsions,
195 irreversible functional impairment and lethality, as well as any non-overt effect on
196 an organism resulting in functional impairment or pathological lesions which may
197 affect the performance of the whole organism, or which reduces an organism's
198 ability to respond to an additional challenge.

199
200 "Chronic Toxicity" means the capacity of any substance or combination of
201 substances to cause injurious or debilitating effects in an organism which result
202 from exposure for a time period representing a substantial portion of the natural
203 life cycle of that organism, including but not limited to the growth phase, the
204 reproductive phases or such critical portions of the natural life cycle of that
205 organism.

206
207 "Criterion" means the numerical concentration of one or more toxic substances
208 derived in compliance with the procedures in Subpart F which, if not exceeded,
209 would assure compliance with the narrative toxicity standard of 35 Ill. Adm. Code
210 302.210.

211
212 "Early Life Stages" of fish means the pre-hatch embryonic period, the post-hatch
213 free embryo or yolk-sac fry, and the larval period, during which the organism
214 feeds. Juvenile fish, which are anatomically similar to adults, are not considered
215 an early life stage.

216
217 "Hardness" means a water quality parameter or characteristic consisting of the
218 sum of calcium and magnesium concentrations expressed in terms of equivalent
219 milligrams per liter as calcium carbonate. Hardness is measured in compliance
220 with methods specified in 40 CFR 136, incorporated by reference in 35 Ill. Adm.

221 Code 301.106.

222
223 "Mixing Zone" means a portion of the waters of the State identified as a region
224 within which mixing is allowed under 35 Ill. Adm. Code 302.102(d).

225
226 "Thermocline" means the plane of maximum rate of decrease of temperature with
227 respect to depth in a thermally stratified body of water.

228
229 "Total Residual Chlorine" or "TRC" means those substances which include
230 combined and uncombined forms of both chlorine and bromine and which are
231 expressed, by convention, as an equivalent concentration of molecular chlorine.
232 TRC is measured in compliance with methods specified in 40 CFR 136,
233 incorporated by reference in 35 Ill. Adm. Code 301.106.

234
235 "Toxic Substance" means a chemical substance that causes adverse effects in
236 humans, or in aquatic or terrestrial animal or plant life. Toxic substances include,
237 but are not limited to, those substances listed in 40 CFR 302.4, incorporated by
238 reference in 35 Ill. Adm. Code 301.106, or any "chemical substance" as defined
239 by the Illinois Chemical Safety Act [430 ILCS 45]

240
241 "ZID" or "Zone of Initial Dilution" means a portion of a mixing zone, identified
242 pursuant to 35 Ill. Adm. Code 302.102(e), within which acute toxicity standards
243 need not be met.

244
245 (Source: Amended at 46 Ill. Reg. _____, effective _____)

246
247 **Section 302.101 Scope and Applicability**

- 248
- 249 a) This Part contains water quality standards which apply throughout the State as
250 designated in 35 Ill. Adm. Code 303. Site specific water quality standards are
251 found with the water use designations in 35 Ill. Adm. Code 303.
 - 252
253 b) Subpart B contains general use water quality standards which must be met in
254 waters of the State for which there is no specific use designation (35 Ill. Adm.
255 Code 303.201).
 - 256
257 c) Subpart C contains the public and food processing water supply standards. These
258 are cumulative with Subpart B and must be met by all designated waters at the
259 point at which water is drawn for treatment and distribution as a potable supply or
260 for food processing (35 Ill. Adm. Code 303.202).
 - 261
262 d) Subpart D contains the Chicago Area Waterway System and the Lower Des
263 Plaines River water quality standards. These standards must be met only by
264 certain waters designated in 35 Ill. Adm. Code 303.204, 303.220, 303.225,

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265 303.227, 303.230, 303.235, 303.240 and 303.449. Subpart D also contains water
266 quality standards applicable to indigenous aquatic life waters found only in the
267 South Fork of the South Branch of the Chicago River (Bubbly Creek).
268

269 e) Subpart E contains the Lake Michigan Basin water quality standards. These must
270 be met in the waters of the Lake Michigan Basin as designated in 35 Ill. Adm.
271 Code 303.443.
272

273 f) Subpart F contains the procedures for determining each of the criteria designated
274 in 35 Ill. Adm. Code 302.210 and 302.410.
275

276 (Source: Amended at 46 Ill. Reg. _____, effective _____)
277

Section 302.102 Allowed Mixing, Mixing Zones and ZIDs

278
279
280 a) Whenever a water quality standard is more restrictive than its corresponding
281 effluent standard, or where there is no corresponding effluent standard specified at
282 35 Ill. Adm. Code 304, an opportunity will be allowed for compliance with 35 Ill.
283 Adm. Code 304.105 by mixture of an effluent with its receiving waters, provided
284 the discharger has made every effort to comply with the requirements of 35 Ill.
285 Adm. Code 304.102.
286

287 b) The portion, volume and area of any receiving waters within which mixing is
288 allowed pursuant to subsection (a) must be limited by the following:
289

290 1) Mixing must be confined in an area or volume of the receiving water no
291 larger than the area or volume which would result after incorporation of
292 outfall design measures to attain optimal mixing efficiency of effluent and
293 receiving waters. These measures may include the use of diffusers and
294 engineered location and configuration of discharge points.
295

296 2) Mixing is not allowed in waters which include a tributary stream entrance
297 if the mixing occludes the tributary mouth or otherwise restricts the
298 movement of aquatic life into or out of the tributary.
299

300 3) Mixing is not allowed in water adjacent to bathing beaches, bank fishing
301 areas, boat ramps or dockages or any other public access area.
302

303 4) Mixing is not allowed in waters containing mussel beds, endangered
304 species habitat, fish spawning areas, areas of important aquatic life habitat,
305 or any other natural features vital to the well being of aquatic life in a
306 manner that maintaining aquatic life in the body of water as a whole
307 would be adversely affected.
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- 5) Mixing is not allowed in waters that contain intake structures of public or food processing water supplies, points of withdrawal of water for irrigation, or watering areas accessed by wild or domestic animals.
 - 6) Mixing must allow for a zone of passage for aquatic life in which water quality standards are met. However, a zone of passage is not required in receiving streams that have zero flow for at least seven consecutive days recurring on average in nine years out of 10.
 - 7) The area and volume in which mixing occurs, alone or in combination with other areas and volumes of mixing, must not intersect any area of any body of water in such a manner that the maintenance of aquatic life in the body of water as a whole would be adversely affected.
 - 8) The area and volume in which mixing occurs, alone or in combination with other areas and volumes of mixing, must not contain more than 25% of the cross-sectional area or volume of flow of a stream except for those streams for which the dilution ratio is less than 3:1. In streams where the dilution ratio is less than 3:1, the volume in which mixing occurs, alone or in combination with other volumes of mixing, must not contain more than 50% of the volume flow unless an applicant for an NPDES permit demonstrates, pursuant to subsection (d), that an adequate zone of passage is provided for pursuant to subsection (b)(6).
 - 9) No mixing is allowed when the water quality standard for the constituent in question is already violated in the receiving water.
 - 10) No body of water may be used totally for mixing of single outfall or combination of outfalls, except as provided in subsection (b)(6).
 - 11) Single sources of effluents that have more than one outfall must be limited to a total area and volume of mixing no larger than that allowable if a single outfall were used.
 - 12) The area and volume in which mixing occurs must be as small as is practicable under the limitations prescribed in this subsection (b), and in no circumstances may the mixing encompass a surface area larger than 26 acres.
- c) All water quality standards of this Part must be met at every point outside of the area and volume of the receiving water within which mixing is allowed. The acute toxicity standards of this Part must be met within the area and volume within which mixing is allowed, except as provided in subsection (e).

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- 353 d) Pursuant to the procedures of Section 39 of the Act and 35 Ill. Adm. Code 309, a
354 person may apply to the Agency to include as a condition in an NPDES permit
355 formal definition of the area and volume of the waters of the State within which
356 mixing is allowed for the NPDES discharge in question. The defined area and
357 volume of allowed mixing shall constitute a "mixing zone" for the purposes of 35
358 Ill. Adm. Code: Subtitle C. Upon proof by the applicant that a proposed mixing
359 zone conforms with the requirements of Section 39 of the Act, this Section and
360 any additional limitations as may be imposed by the Clean Water Act (CWA) (33
361 U.S.C. 1251 et seq.), the Act or Board regulations, the Agency must, under
362 Section 39(b) of the Act, include within the NPDES permit a condition defining
363 the mixing zone.
364
- 365 e) Under the procedures of Section 39 of the Act and 35 Ill. Adm. Code 309, a
366 person may apply to the Agency to include as a condition in an NPDES permit a
367 ZID as a component portion of a mixing zone. The ZID must be limited to waters
368 within which effluent dispersion is immediate and rapid. For this subsection,
369 "immediate" dispersion means an effluent's merging with receiving waters
370 without delay in time after its discharge and within close proximity of the end of
371 the discharge pipe, so as to minimize the length of exposure time of aquatic life to
372 undiluted effluent, and "rapid" dispersion means an effluent's merging with
373 receiving waters so as to minimize the length of exposure time of aquatic life to
374 undiluted effluent. Upon proof by the applicant that a proposed ZID conforms
375 with the requirements of Section 39 of the Act and this Section, the Agency must
376 under Section 39(b) of the Act, include within the NPDES permit a condition
377 defining the ZID.
378
- 379 f) Under Section 39 of the Act and 35 Ill. Adm. Code 309.103, an applicant for an
380 NPDES permit must submit data to allow the Agency to determine that the nature
381 of any mixing zone or mixing zone in combination with a ZID conforms with the
382 requirements of Section 39 of the Act and of this Section. A permittee may
383 appeal Agency determinations concerning a mixing zone or ZID under the
384 procedures of Section 40 of the Act and 35 Ill. Adm. Code 309.181.
385
- 386 g) When a mixing zone is defined in an NPDES permit, the waters within that
387 mixing zone, for the duration of that NPDES permit, constitutes the sole waters
388 within which mixing is allowed for the permitted discharge. It will not be a
389 defense in any action brought pursuant to 35 Ill. Adm. Code 304.105 that the area
390 and volume of waters within which mixing may be allowed pursuant to subsection
391 (b) is less restrictive than the area or volume or waters encompassed in the mixing
392 zone.
393
- 394 h) When a mixing zone is explicitly denied in a NPDES permit, no waters may be
395 used for mixing by the discharge to which the NPDES permit applies, all other
396 provisions of this Section notwithstanding.

- 397
398 i) Where an NPDES permit is silent on the matter of a mixing zone, or when no
399 NPDES permit is in effect, the burden of proof will be on the discharger to
400 demonstrate compliance with this Section in any action brought pursuant to 35 Ill.
401 Adm. Code 304.105.
402

403 (Source: Amended at 46 Ill. Reg. _____, effective _____)
404

405 **Section 302.103 Stream Flows**
406

407 Except as otherwise provided in this Chapter, the water quality standards in this Part apply at all
408 times except during periods when flows are less than the average minimum seven day low flow
409 which occurs once in ten years.
410

411 (Source: Amended at 46 Ill. Reg. _____, effective _____)
412

413 **Section 302.105 Antidegradation**
414

415 This Section protects existing uses of all waters of the State of Illinois, maintains the quality of
416 waters with quality that is better than water quality standards, and prevents unnecessary
417 deterioration of waters of the State.
418

419 a) Existing Uses

420 Uses actually attained in a surface water body or water body segment on or after
421 November 28, 1975, whether or not they are included in the water quality
422 standards, must be maintained and protected. Examples of degradation of
423 existing uses of the waters of the State include:
424

- 425 1) an action that would result in the deterioration of the existing aquatic
426 community, such as a shift from a community of predominantly pollutant-
427 sensitive species to pollutant-tolerant species or a loss of species diversity;
428
429 2) an action that would result in a loss of a resident or indigenous species
430 whose presence is necessary to sustain commercial or recreational
431 activities; or
432
433 3) an action that would preclude continued use of a surface water body or
434 water body segment for a public water supply or for recreational or
435 commercial fishing, swimming, paddling or boating.
436

437 b) Outstanding Resource Waters
438

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

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- 441 303.206 must not be lowered in quality except as provided below:
442
443 A) Activities that result in short-term, temporary (i.e., weeks or
444 months) lowering of water quality in an ORW; or
445
446 B) Existing site stormwater discharges that comply with applicable
447 federal and State stormwater management regulations and do not
448 result in a violation of any water quality standards.
449
- 450 2) Any activity in subsection (b)(1)(A) or (b)(1)(B) that requires a National
451 Pollutant Discharge Elimination System (NPDES) permit or a Clean
452 Water Act (CWA) Section 401 certification must also comply with
453 subsection (c)(2).
454
- 455 3) Any activity listed in subsection (b)(1) or any other proposed increase in
456 pollutant loading to an ORW must also meet the following requirements:
457
458 A) All existing uses of the water will be fully protected; and
459
460 B) Except for activities falling under one of the exceptions provided
461 in subsection (b)(1)(A) or (B) above:
462
463 i) The proposed increase in pollutant loading is necessary for
464 an activity that will improve water quality in the ORW; and
465
466 ii) The improvement could not be practicably achieved
467 without the proposed increase in pollutant loading.
468
- 469 4) Any proposed increase in pollutant loading requiring an NPDES permit or
470 a CWA 401 certification for an ORW must be assessed pursuant to
471 subsection (f) to determine compliance with this Section.
472
- 473 c) High Quality Waters
474
- 475 1) Except as otherwise provided in subsection (d), waters of the State whose
476 existing quality is better than any of the established standards of this Part
477 must be maintained in their present high quality, unless the lowering of
478 water quality is necessary to accommodate important economic or social
479 development.
480
- 481 2) The Agency must assess any proposed increase in pollutant loading that
482 necessitates a new, renewed or modified NPDES permit or any activity
483 requiring a CWA Section 401 certification to determine compliance with
484 this Section. The assessment to determine compliance with this Section

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- 485 must be made on a case-by-case basis. In making this assessment, the
486 Agency must:
487
- 488 A) Consider the fate and effect of any parameters proposed for an
489 increased pollutant loading.
490
- 491 B) Assure the following:
492
- 493 i) The applicable numeric or narrative water quality standard
494 will not be exceeded as a result of the proposed activity;
495
- 496 ii) All existing uses will be fully protected;
497
- 498 iii) All technically and economically reasonable measures to
499 avoid or minimize the extent of the proposed increase in
500 pollutant loading have been incorporated into the proposed
501 activity; and
502
- 503 iv) The activity that results in an increased pollutant loading
504 will benefit the community at large.
505
- 506 C) Use the following information sources, when available:
507
- 508 i) Information, data or reports available to the Agency from
509 its own sources;
510
- 511 ii) Information, data or reports supplied by the applicant;
512
- 513 iii) Agency experience with factually similar permitting
514 scenarios; and
515
- 516 iv) Any other valid information available to the Agency.
517
- 518 d) Activities Not Subject to a Further Antidegradation Assessment
519 The following activities will not be subject to a further antidegradation
520 assessment under subsection (c).
521
- 522 1) Short-term, temporary (i.e., weeks or months) lowering of water quality;
523
- 524 2) Bypasses that are not prohibited at 40 CFR 122.41(m), incorporated by
525 reference at 35 Ill. Adm. Code 301.106;
526
- 527 3) Response actions under the Comprehensive Environmental Response,
528 Compensation and Liability Act (CERCLA), as amended, corrective

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- 529 actions, under the Resource Conservation and Recovery Act (RCRA), as
530 amended, or similar federal or State authority, taken to alleviate a release
531 into the environment of hazardous substances, pollutants or contaminants
532 which may pose a danger to public health or welfare;
533
- 534 4) Thermal discharges that have been approved through a CWA Section
535 316(a) demonstration;
536
- 537 5) New or increased discharges of a non-contact cooling water:
538
- 539 A) without additives, except as provided in subsection (d)(5)(B),
540 returned to the same body of water from which it was taken, as
541 defined by 35 Ill. Adm. Code 352.104, provided that the discharge
542 complies with applicable Illinois thermal standards; or
543
- 544 B) containing chlorine when the non-contact cooling water is treated
545 to remove residual chlorine, and returned to the same body of
546 water from which it was taken, as defined in 35 Ill. Adm. Code
547 352.104, provided that the discharge complies with applicable
548 Illinois thermal and effluent standards at 35 Ill. Adm. Code 302,
549 303, and 304;
550
- 551 6) Discharges permitted under a current general NPDES permit as provided
552 by 415 ILCS 5/39(b) or a nationwide or regional CWA Section 404 permit
553 are not subject to facility-specific antidegradation review; however, the
554 Agency must assure that individual permits or certifications are required
555 prior to all new pollutant loadings or hydrological modifications that
556 necessitate a new, renewed or modified NPDES permit or CWA Section
557 401 certification that affects waters of particular biological significance,
558 which may include streams identified by the Illinois Department of
559 Natural Resources as "biologically significant"; or
560
- 561 7) Changing or including a new permit limitation that does not result in an
562 actual increase of a pollutant loading, such as those stemming from
563 improved monitoring data, new analytical testing methods, new or revised
564 technology or water quality based effluent limits.
565
- 566 e) Lake Michigan Basin
567 Waters in the Lake Michigan basin as identified in 35 Ill. Adm. Code 303.443 are
568 also subject to the requirements applicable to bioaccumulative chemicals of
569 concern found at 35 Ill. Adm. Code 302.521.
570
- 571 f) Antidegradation Assessments
572 In conducting an antidegradation assessment under this Section, the Agency must

573 comply with the following procedures.

574
575 1) A permit application for any proposed increase in pollutant loading that
576 necessitates the issuance of a new, renewed, or modified NPDES permit or
577 a CWA Section 401 certification must include, to the extent necessary for
578 the Agency to determine that the permit application meets the
579 requirements of this Section, the following information:

580
581 A) Identification and characterization of the water body affected by
582 the proposed load increase or proposed activity and the existing
583 water body's uses. Characterization must address physical,
584 biological and chemical conditions of the water body.

585
586 B) Identification and quantification of the proposed load increases for
587 the applicable parameters and of the potential impacts of the
588 proposed activity on the affected waters.

589
590 C) The purpose and anticipated benefits of the proposed activity.
591 Such benefits may include:

592
593 i) Providing a centralized wastewater collection and treatment
594 system for a previously unsewered community;

595
596 ii) Expanding to provide service for anticipated residential or
597 industrial growth consistent with a community's long range
598 urban planning;

599
600 iii) Adding a new product line or production increase or
601 modification at an industrial facility; or

602
603 iv) Increasing or retaining current employment levels at a
604 facility.

605
606 D) Assessments of alternatives to proposed increases in pollutant
607 loading or activities subject to Agency certification under Section
608 401 of the CWA that result in less of a load increase, no load
609 increase or minimal environmental degradation. Such alternatives
610 may include:

611
612 i) Additional treatment levels, including no discharge
613 alternatives;

614
615 ii) Discharge of waste to alternate locations, including
616 publicly-owned treatment works and streams with greater

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- 617 assimilative capacity; or
618
619 iii) Manufacturing practices that incorporate pollution
620 prevention techniques.
621
622 E) Any additional information the Agency may request.
623
624 F) Proof that a copy of the application has been provided to the
625 Illinois Department of Natural Resources.
626
627 2) The Agency must complete an antidegradation assessment in compliance
628 with the provisions of this Section on a case-by-case basis.
629
630 A) The Agency must consider the criteria stated in 35 Ill. Adm. Code
631 302.105(c)(2).
632
633 B) The Agency must consider the information provided by the
634 applicant under subsection (f)(1).
635
636 C) After its assessment, the Agency must produce a written analysis
637 addressing the requirements of this Section and provide a decision
638 yielding one of the following results:
639
640 i) If the proposed activity meets the requirements of this
641 Section, then the Agency must proceed with public notice
642 of the NPDES permit or CWA Section 401 certification
643 and include the written analysis as a part of the fact sheet
644 accompanying the public notice;
645
646 ii) If the proposed activity does not meet the requirements of
647 this Section, then the Agency must provide a written
648 analysis to the applicant and must be available to discuss
649 the deficiencies that led to the disapproval. The Agency
650 may suggest methods to remedy the conflicts with the
651 requirements of this Section;
652
653 iii) If the proposed activity does not meet the requirements of
654 this Section, but some lowering of water quality is
655 allowable, then the Agency will contact the applicant with
656 the results of the review. If the reduced loading increase is
657 acceptable to the applicant, upon the receipt of an amended
658 application, the Agency will proceed to public notice; or if
659 the reduced loading increase is not acceptable to the
660 applicant, the Agency will transmit its written review to the

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- 661 applicant in the context of an NPDES permit denial or a
662 CWA Section 401 certification denial.
663
664 3) The Agency will conduct public notice and public participation through
665 the public notice procedures found in 35 Ill. Adm. Code 309.109 or CWA
666 Section 401 certifications. The Agency must incorporate the following
667 information into a fact sheet accompanying the public notice:
668
669 A) A description of the activity, including identification of water
670 quality parameters for which there will be an increased pollutant
671 loading;
672
673 B) Identification of the affected surface water body or water body
674 segment, any downstream surface water body or water body
675 segment also expected to experience a lowering of water quality,
676 characterization of the designated and current uses of the affected
677 surface water body or water body segment and identification of
678 which uses are most sensitive to the proposed load increase;
679
680 C) A summary of any review comments and recommendations
681 provided by Illinois Department of Natural Resources, local or
682 regional planning commissions, zoning boards and any other
683 entities the Agency consults regarding the proposal;
684
685 D) An overview of alternatives considered by the applicant and
686 identification of any provisions or alternatives imposed to lessen
687 the load increase associated with the proposed activity; and
688
689 E) The name and telephone number of a contact person at the Agency
690 who can provide additional information.

691
692 (Source: Amended at 46 Ill. Reg. _____, effective _____)
693

SUBPART B: GENERAL USE WATER QUALITY STANDARDS

694 **Section 302.201 Scope and Applicability** 695

696 Subpart B contains general use water quality standards which must be met in waters of the State
697 for which there is no specific designation (35 Ill. Adm. Code 303.201).
698
699

700
701 (Source: Amended at 46 Ill. Reg. _____, effective _____)
702

703 **Section 302.202 Purpose** 704

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

709
710 (Source: Amended at 46 Ill. Reg. _____, effective _____)

711 712 **Section 302.203 Offensive Conditions**

713
714 Waters of the State must be free from sludge or bottom deposits, floating debris, visible oil, odor,
715 plant or algal growth, color or turbidity of other than natural origin. The allowed mixing
716 provisions of 35 Ill. Adm. Code 302.102 must not be used to comply with the provisions of this
717 Section.

718
719 (Source: Amended at 46 Ill. Reg. _____, effective _____)

720 721 **Section 302.204 pH**

722
723 pH must be within the range of 6.5 to 9.0 except for natural causes.

724
725 (Source: Amended at 46 Ill. Reg. _____, effective _____)

726 727 **Section 302.205 Phosphorus**

728
729 Phosphorus: After December 31, 1983, Phosphorus as P must not exceed 0.05 milligram per
730 liter (mg/L) in any reservoir or lake with a surface area of 8.1 hectares (20 acres) or more, or in
731 any stream at the point where it enters any such reservoir or lake. For this Section, the term
732 "reservoir or lake" does not include low level pools constructed in free flowing streams or any
733 body of water which is an integral part of an operation which includes the application of sludge
734 on land. Point source discharges which comply with 35 Ill. Adm. Code 304.123 must be in
735 compliance with this Section for purposes of application of 35 Ill. Adm. Code 304.105.

736
737 (Source: Amended at 46 Ill. Reg. _____, effective _____)

738 739 **Section 302.206 Dissolved Oxygen**

740
741 General use waters must maintain dissolved oxygen concentrations at or above the values
742 contained in subsections (a), (b) and (c).

743
744 a) General use waters at all locations must maintain sufficient dissolved oxygen
745 concentrations to prevent offensive conditions as required in 35 Ill. Adm. Code
746 302.203. Quiescent and isolated sectors of General Use waters including
747 wetlands, sloughs, backwaters and waters below the thermocline in lakes and

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- 748 reservoirs must be maintained at sufficient dissolved oxygen concentrations to
749 support their natural ecological functions and resident aquatic communities.
750
- 751 b) Except in those waters identified in Appendix D, the dissolved oxygen
752 concentration in the main body of all streams, in the water above the thermocline
753 of thermally stratified lakes and reservoirs, and in the entire water column of
754 unstratified lakes and reservoirs must not be less than the following:
755
- 756 1) During the period of March through July,
757
758 A) 5.0 mg/L at any time; and
759
760 B) 6.0 mg/L as a daily mean averaged over 7 days.
761
- 762 2) During the period of August through February,
763
764 A) 3.5 mg/L at any time;
765
766 B) 4.0 mg/L as a daily minimum averaged over 7 days; and
767
768 C) 5.5 mg/L as a daily mean averaged over 30 days.
769
- 770 c) The dissolved oxygen concentration in all sectors within the main body of all
771 streams identified in Appendix D must not be less than:
772
- 773 1) During the period of March through July,
774
775 A) 5.0 mg/L at any time; and
776
777 B) 6.25 mg/L as a daily mean averaged over 7 days.
778
- 779 2) During the period of August through February,
780
781 A) 4.0 mg/L at any time;
782
783 B) 4.5 mg/L as a daily minimum averaged over 7 days; and
784
785 C) 6.0 mg/L as a daily mean averaged over 30 days.
786
- 787 d) Assessing attainment of dissolved oxygen mean and minimum values.
788
- 789 1) Daily mean is the arithmetic mean of dissolved oxygen concentrations in
790 24 consecutive hours.
791

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- 792 2) Daily minimum is the minimum dissolved oxygen concentration in 24
793 consecutive hours.
794
- 795 3) The measurements of dissolved oxygen used to determine attainment or
796 lack of attainment with any of the dissolved oxygen standards in this
797 Section must assure daily minima and daily means that represent the true
798 daily minima and daily means.
799
- 800 4) The dissolved oxygen concentrations used to determine a daily mean or
801 daily minimum should not exceed the air-equilibrated concentration.
802
- 803 5) "Daily minimum averaged over 7 days" means the arithmetic mean of
804 daily minimum dissolved oxygen concentrations in 7 consecutive 24-hour
805 periods.
806
- 807 6) "Daily mean averaged over 7 days" means the arithmetic mean of daily
808 mean dissolved oxygen concentrations in 7 consecutive 24-hour periods.
809
- 810 7) "Daily mean averaged over 30 days" means the arithmetic mean of daily
811 mean dissolved oxygen concentrations in 30 consecutive 24-hour periods.
812

813 (Source: Amended at 46 Ill. Reg. _____, effective _____)
814

Section 302.207 Radioactivity

- 815
816
- 817 a) Gross beta concentration must not exceed 100 picocuries per liter (pCi/L).
818
- 819 b) Strontium 90 concentration must not exceed 2 pCi/L.
820
- 821 c) The annual average radium 226 and 228 combined concentration must not exceed
822 3.75 pCi/L.
823

824 (Source: Amended at 46 Ill. Reg. _____, effective _____)
825

Section 302.208 Numeric Standards for Chemical Constituents

- 826
827
- 828 a) The acute standard (AS) for the chemical constituents listed in subsection (e) must
829 not be exceeded at any time except for those waters for which a zone of initial
830 dilution (ZID) has been approved by the Agency under 35 Ill. Adm. Code
831 302.102.
832
- 833 b) The chronic standard (CS) for the chemical constituents listed in subsection (e)
834 must not be exceeded by the arithmetic average of at least four consecutive
835 samples collected over any period of at least four days, except for those waters in

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836 which the Agency has approved a mixing zone or in which mixing is allowed
 837 under 35 Ill. Adm. Code 302.102. The samples used to demonstrate attainment or
 838 lack of attainment with a CS must be collected in a manner that assures an
 839 average representative of the sampling period. For the chemical constituents that
 840 have water quality based standards dependent upon hardness, the chronic water
 841 quality standard will be calculated according to subsection (e) using the hardness
 842 of the water body at the time the sample was collected. To calculate attainment
 843 status of chronic-standards, the concentration of the chemical constituent in each
 844 sample is divided by the calculated water quality standard for the sample to
 845 determine a quotient. The water quality standard is attained if the mean of the
 846 sample quotients is less than or equal to one for the duration of the averaging
 847 period.
 848

849 c) The human health standard (HHS) for the chemical constituents listed in
 850 subsection (f) must not be exceeded when the stream flow is at or above the
 851 harmonic mean flow under 35 Ill. Adm. Code 302.658 nor must an annual
 852 average, based on at least eight samples, collected in a manner representative of
 853 the sampling period, exceed the HHS except for those waters in which the Agency
 854 has approved a mixing zone or in which mixing is allowed under 35 Ill. Adm.
 855 Code 302.102.
 856

857 d) The standard for the chemical constituents of subsections (g) and (h) must not be
 858 exceeded at any time except for those waters in which the Agency has approved a
 859 mixing zone or in which mixing is allowed under 35 Ill. Adm. Code 302.102.
 860

861 e) Numeric Water Quality Standards for the Protection of Aquatic Organisms
 862

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)	$e^{A+B \ln(H)} \times \left\{ 1.138672 - \left[\frac{1.138672 - 1}{\ln(H) - 0.041838} \right] \right\}^*$	$e^{A+B \ln(H)} \times \left\{ 1.101672 - \left[\frac{1.101672 - 1}{\ln(H) - 0.041838} \right] \right\}^*$
	where $A = -2.918$ and $B = 1.128$	where $A = -3.490$ and $B = 0.7852$

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

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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

863

where:

- µg/L = microgram per liter
- e^x = base of natural logarithms raised to the x-power
- $\ln(H)$ = natural logarithm of Hardness (in mg/L as CaCO₃)
- * = 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)

864

865

866

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

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

867

where:

µg/L = micrograms per liter

868

869

870

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

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

871

where:

mg/L = milligram per liter and

µg/L = microgram per liter

872

873

h) Water quality standards for sulfate are as follows:

874

875

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.

876

877

878

879

880

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 CaCO₃) and chloride (in mg/L) and must be met at all times:

881

882

883

884

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:

885

886

887

888

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

889

890

891

where:

892

893

C = sulfate concentration

894

895

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:

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942

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

where:

C = sulfate concentration

- 3) The following sulfate standards must be met at all times when hardness (in mg/L as CaCO₃) and chloride (in mg/L) concentrations other than specified in (h)(2) are present:
 - A) If the hardness concentration of waters is less than 100 mg/L or chloride concentration of waters is less than 5 mg/L, the sulfate standard is 500 mg/L.
 - B) If the hardness concentration of waters is greater than 500 mg/L and the chloride concentration of waters is 5 mg/L or greater, the sulfate standard is 2,000 mg/L.
 - C) If the combination of hardness and chloride concentrations of existing waters are not reflected in subsection (h)(3)(A) or (B), the sulfate standard may be determined in a site-specific rulemaking under section 303(c) of the Federal Water Pollution Control Act of 1972 (Clean Water Act), 33 U.S.C. 1313, and Federal Regulations at 40 CFR 131.10(j)(2).

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

Section 302.209 Fecal Coliform

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

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

947
948 c) The Agency must apply this rule as required by 35 Ill. Adm. Code 304.121.

949
950 (Source: Amended at 46 Ill. Reg. _____, effective _____)

951

Section 302.210 Other Toxic Substances

952

953
954 Waters of the State must be free from any substances or combination of substances in
955 concentrations toxic or harmful to human health, or to animal, plant or aquatic life. Individual
956 chemical substances or parameters for which numeric standards are specified in this Subpart are
957 not subject to this Section.

958

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

961

962 1) An Acute Aquatic Toxicity Criterion (AATC) validly derived and
963 correctly applied under procedures in 35 Ill. Adm. Code 302.612 through
964 302.618 or in 35 Ill. Adm. Code 302.621; or

965

966 2) A Chronic Aquatic Toxicity Criterion (CATC) validly derived and
967 correctly applied under procedures in 35 Ill. Adm. Code 302.627 or
968 302.630.

969

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

974

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

978

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

983

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

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- d) The most stringent criterion of subsections (a), (b), and (c) applies at all points outside of any waters within which, mixing is allowed under 35 Ill. Adm. Code 302.102. In addition, the AATC derived under subsection (a)(1) applies in all waters except that it must not apply within a ZID that is prescribed in compliance with 35 Ill. Adm. Code 302.102.
 - e) The procedures of Subpart F set forth minimum data requirements, appropriate test protocols and data assessment methods for establishing criteria under subsections (a), (b), and (c). No other procedures may be used to establish such criteria unless approved by the Board in a rulemaking or adjusted standards proceeding under Title VII of the Act. The validity and applicability of the Subpart F procedures may not be challenged in any proceeding brought under Titles VIII or X of the Act, although the validity and correctness of application of the numeric criteria derived under Subpart F may be challenged in such proceedings under subsection (f).
 - f) Challenges to application of criteria
 - 1) A permittee may challenge the validity and correctness of application of a criterion derived by the Agency under this Section only at the time such criterion is first applied in an NPDES permit under 35 Ill. Adm. Code 309.152 or in an action under Title VIII of the Act for violation of the toxicity water quality standard. Failure of a person to challenge the validity of a criterion at the time of its first application will constitute a waiver of such challenge in any subsequent proceeding involving application of the criterion to that person.
 - 2) Consistent with subsection (f)(1), if a criterion is included as, or is used to derive, a condition of an NPDES discharge permit, a permittee may challenge the criterion in a permit appeal under Section 40 of the Act and 35 Ill. Adm. Code 309.181.
 - 3) Consistent with subsection (f)(1), in an action where alleged violation of the toxicity water quality standard is based on alleged excursion of a criterion, the person bringing such action will have the burdens of going forward with proof and of persuasion regarding the general validity and correctness of application of the criterion.
 - g) Subsections (a) through (e) do not apply to USEPA registered pesticides approved for aquatic application and applied under the following conditions:
 - 1) Application must be made in strict compliance with label directions;

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- 1031 2) Applicator must be properly certified under the provisions of the Federal
1032 Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 135 et seq. (1972));
1033
1034 3) Applications of aquatic pesticides must be in compliance with the laws,
1035 regulations and guidelines of all state and federal agencies authorized by
1036 law to regulate, use or supervise pesticide applications.
1037
1038 4) Aquatic pesticide must not be applied to waters affecting public or food
1039 processing water supplies unless a permit to apply the pesticide has been
1040 obtained from the Agency. All permits must be issued so as not to cause a
1041 violation of the Act or of any of the Board's rules or regulations. To aid
1042 applicators in determining their responsibilities under this subsection, a list
1043 of waters affecting public water supplies will be published and maintained
1044 by the Agency's Division of Public Water Supplies.
1045

1046 (Source: Amended at 46 Ill. Reg. _____, effective _____)
1047

Section 302.211 Temperature

- 1048
1049
1050 a) There must not be abnormal temperature changes that may adversely affect
1051 aquatic life unless caused by natural conditions.
1052
1053 b) The normal daily and seasonal temperature fluctuations which existed before the
1054 addition of heat due to other than natural causes must be maintained.
1055
1056 c) The maximum temperature rise above natural temperatures must not exceed 2.8
1057 °C (5 °F).
1058
1059 d) In addition, the water temperature at representative locations in the main river
1060 must not exceed the maximum limits in the following table during more than one
1061 percent of the hours in the 12-month period ending with any month. Moreover,
1062 the water temperature at such locations must never exceed the maximum limits in
1063 the following table by more than 1.7 °C (3 °F).
1064

	°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

- 1065
1066 e) The owner or operator of a source of heated effluent which discharges 150

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1067 megawatts (0.5 billion British thermal units per hour) or more must demonstrate
1068 in a hearing before the Board in the case of new sources, after the commencement
1069 of operation, that discharges from that source have not caused and cannot be
1070 reasonably expected to cause significant ecological damage to the receiving
1071 waters. If the demonstration is not made to the satisfaction of the Board, the
1072 Board must order appropriate corrective measures to be implemented within a
1073 reasonable time as determined by the Board.
1074

1075 f) Permits for heated effluent discharges, whether issued by the Board or the Illinois
1076 Environmental Protection Agency (Agency), can be revised if reasonable future
1077 development creates a need for reallocation of the assimilative capacity of the
1078 receiving stream as defined in the regulation above.
1079

1080 g) The owner or operator of a source of heated effluent must maintain records and
1081 conduct studies of the effluents from the sources and of their effects as may be
1082 required by the Agency or in any permit granted under the Act.
1083

1084 h) Appropriate corrective measures will be required if, upon complaint filed in
1085 compliance with Board rules, it is found at any time that any heated effluent
1086 causes significant ecological damage to the receiving stream.
1087

1088 i) All effluents to an artificial cooling lake must comply with the applicable
1089 provisions of the thermal water quality standards in this Section and 35 Ill. Adm.
1090 Code 303, except when all of the following requirements are met:
1091

1092 1) All discharges from the artificial cooling lake to other waters of the State
1093 comply with the applicable provisions of subsections (a) through (d).
1094

1095 2) The heated effluent discharged to the artificial cooling lake complies with
1096 all other applicable provisions of this Chapter, except subsections (a)
1097 through (d).
1098

1099 3) At an adjudicative hearing the discharger must satisfactorily demonstrate
1100 to the Board that the artificial cooling lake receiving the heated effluent
1101 will be environmentally acceptable, and within the intent of the Act,
1102 including:
1103

1104 A) providing conditions capable of supporting shellfish, fish and
1105 wildlife, and recreational uses consistent with good management
1106 practices, and
1107

1108 B) controlling the thermal component of the discharger's effluent by a
1109 technologically feasible and economically reasonable method.
1110

- 1111 4) The required demonstration in subsection (j)(3) may take the form of an
- 1112 acceptable final environmental impact statement or pertinent provisions of
- 1113 environmental assessments used in the preparation of the final
- 1114 environmental impact statement, or may take the form of a demonstration
- 1115 under Section 316(a) of the Clean Water Act (CWA)(33 U.S.C. 1251 et
- 1116 seq.), which addresses the requirements of subsection (j)(3).
- 1117
- 1118 5) If the Board finds the demonstration to be adequate as provided in
- 1119 subsection (i)(3), the Board must promulgate specific thermal standards to
- 1120 be applied to the discharge to that artificial cooling Lake.
- 1121

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

Section 302.212 Total Ammonia Nitrogen

- 1124 a) Total ammonia nitrogen must in no case exceed 15 mg/L.
- 1125
- 1126 b) The total ammonia nitrogen acute, chronic, and sub-chronic standards are
- 1127 determined by the equations given in subsections (b)(1) and (b)(2). Attainment of
- 1128 each standard must be determined by subsections (c) and (d) in mg/L.
- 1129
- 1130 1) The acute standard (AS) is calculated using the following equation:
- 1131
- 1132
- 1133

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

- 1134 2) The chronic standard (CS) is calculated using the following equations:
- 1135
- 1136
- 1137 A) During the Early Life Stage Present period, as defined in
- 1138 subsection (e):
- 1139
- 1140 i) When water temperature is less than or equal to 14.51 °C:
- 1141

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

- 1142 ii) When water temperature is above 14.51 °C:
- 1143
- 1144

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

Where T = Water Temperature, degrees Celsius

- 1145 B) During the Early Life Stage Absent period, as defined in
- 1146
- 1147
- 1148

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1149 subsection (e):

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1152

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

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

1153

1154

1155

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

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

1156

1157

Where T = Water Temperature, degrees Celsius

1158

1159

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

1160

1161

c) Attainment of the Total Ammonia Nitrogen Water Quality Standards

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1163

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

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

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

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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

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1189 or equal to one for the duration of the averaging period.

1190
1191 e) The Early Life Stage Present period occurs from March through October. In
1192 addition, during any other period when early life stages are present, and where the
1193 water quality standard does not provide adequate protection for these organisms,
1194 the water body must meet the Early Life Stage Present water quality standard. All
1195 other periods are subject to the Early Life Stage Absent period.

1196
1197 BOARD NOTE: Acute and chronic standard concentrations for total ammonia nitrogen
1198 (in mg/L) for different combinations of pH and temperature are shown in Appendix C.

1199
1200 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1201
1202 **SUBPART C: PUBLIC AND FOOD PROCESSING WATER SUPPLY STANDARDS**

1203
1204 **Section 302.301 Scope and Applicability**

1205
1206 Subpart C contains the public and food processing water supply standards. These are cumulative
1207 with the general use standards of Subpart B and must be met in all waters designated in Part 303
1208 at any point at which water is withdrawn for treatment and distribution as a potable supply or for
1209 food processing. Waters of the State are generally designated for public and food processing use
1210 (35 Ill. Adm. Code 303.202).

1211
1212 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1213
1214 **Section 302.302 Algicide Permits**

1215
1216 The water quality standards of Subparts B and C may be exceeded if the occurrence results from
1217 applying an algicide under an algicide permit issued by the Agency under 35 Ill. Adm. Code 602.
1218 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1219
1220 **Section 302.303 Finished Water Standards**

1221
1222 Water must be of such quality that with treatment consisting of coagulation, sedimentation,
1223 filtration, storage and chlorination, or other equivalent treatment processes, the treated water
1224 meets all requirements of 35 Ill. Adm. Code 611.

1225
1226 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1227
1228 **Section 302.304 Chemical Constituents**

1229
1230 The following levels of chemical constituents must not be exceeded:

1231

CONCENTRATION

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

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1233 (Source: Amended at 46 Ill. Reg. _____, effective _____)
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1235

Section 302.305 Other Contaminants

1236

1237 Other contaminants which will not be adequately reduced by the treatment processes in 35 Ill.

1238 Adm. Code 302.303 must not be present in concentrations hazardous to human health.

1239

1240 (Source: Amended at 46 Ill. Reg. _____, effective _____)
1241

1242

Section 302.306 Fecal Coliform

1243

1244 Notwithstanding the provisions of 35 Ill. Adm. Code 302.209, at no time shall the geometric

1245 mean, based on a minimum of five samples taken over not more than a 30 day period, of fecal

1246 coliform exceed 2000 per 100 ml.

1247

1248 (Source: Amended at 46 Ill. Reg. _____, effective _____)
1249

1250

Section 302.307 Radium 226 and 228

1251

1252 Radium 226 and 228 combined concentration must not exceed 5 picocuries per liter (pCi/L) at

1253 any time.

1254

1255 (Source: Amended at 46 Ill. Reg. _____, effective _____)
1256

1257

SUBPART D: CHICAGO AREA WATERWAY SYSTEM

1258

AND LOWER DES PLAINES RIVER WATER QUALITY STANDARDS AND

1259

INDIGENOUS AQUATIC LIFE STANDARDS

1260

Section 302.401 Scope and Applicability

1262

1263 a) Subpart D contains the standards that must be met only by the South Fork of the
1264 South Branch of the Chicago River (Bubbly Creek). The Subpart B general use
1265 and Subpart C public and food processing water supply standards do not apply to
1266 Bubbly Creek.

1267

1268 b) Subpart D also contains the Chicago Area Waterway System and Lower Des
1269 Plaines River water quality standards. Except for the Chicago River, these
1270 standards must be met only by waters specifically designated in 35 Ill. Adm. Code
1271 303. The Subpart B general use and Subpart C public and food processing water
1272 supply standards of this Part do not apply to waters described in 35 Ill. Adm.
1273 Code 303.204 as the Chicago Area Waterway System or Lower Des Plaines River
1274 and listed in 35 Ill. Adm. Code 303.220 through 303.240, except that waters
1275 designated as Primary Contact Recreation Waters in 35 Ill. Adm. Code 303.220
1276 must meet the numeric water quality standard for bacteria applicable to protected

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1277 waters in 35 Ill. Adm. Code 302.209. The Chicago River must meet the general
1278 use standards, including the numeric water quality standard for fecal coliform
1279 bacteria applicable to protected waters in 35 Ill. Adm. Code 302.209.

1280

1281 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1282

1283 **Section 302.402 Purpose**

1284

1285 The Chicago Area Waterway System and Lower Des Plaines River standards protect primary
1286 contact, incidental contact or non-contact recreational uses (except when designated as non-
1287 recreational waters); commercial activity, including navigation and industrial water supply uses;
1288 and the highest quality aquatic life and wildlife that is attainable, limited only by the physical
1289 condition of these waters and hydrologic modifications to these waters. The numeric and
1290 narrative standards in this Part will assure the protection of the aquatic life, wildlife, human
1291 health, and recreational uses of the Chicago Area Waterway System and Lower Des Plaines
1292 River as those uses are defined in 35 Ill. Adm. Code 301 and designated in 35 Ill. Adm. Code
1293 303. Indigenous aquatic life standards are intended for the South Fork of the South Branch of the
1294 Chicago River (Bubbly Creek), which is capable of supporting an indigenous aquatic life limited
1295 only by the physical configuration of the body of water, characteristics and origin of the water
1296 and the presence of contaminants in amounts that do not exceed the water quality standards listed
1297 in this Subpart D. However, the Chicago River is required to meet the general use standard,
1298 including the water quality standard for fecal coliform bacteria applicable to protected waters in
1299 35 Ill. Adm. Code 302.209.

1300

1301 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1302

1303 **Section 302.403 Unnatural Sludge**

1304

1305 Waters subject to this subpart must be free from unnatural sludge or bottom deposits, floating
1306 debris, visible oil, odor, unnatural plant or algal growth, or unnatural color or turbidity.

1307

1308 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1309

1310 **Section 302.404 pH**

1311

1312 pH must be within the range of 6.5 to 9.0 except for natural causes, except for the South Fork of
1313 the South Branch of the Chicago River (Bubbly Creek) for which pH must be within the range of
1314 6.0 to 9.0 except for natural causes.

1315

1316 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1317

1318 **Section 302.405 Dissolved Oxygen**

1319

1320 Dissolved oxygen concentrations must not be less than the applicable values in subsections (a),

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- 1321 (b), (c), and (d).
1322
1323 a) For the South Fork of the South Branch of the Chicago River (Bubbly Creek),
1324 dissolved oxygen concentrations must not be less than 4.0 mg/L at any time.
1325
1326 b) For the Upper Dresden Island Pool Aquatic Life Use waters listed in 35 Ill. Adm.
1327 Code 303.230:
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1329 1) during the period of March through July:
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1331 A) 6.0 mg/L as a daily mean averaged over 7 days; and
1332
1333 B) 5.0 mg/L at any time; and
1334
1335 2) during the period of August through February:
1336
1337 A) 5.5 mg/L as a daily mean averaged over 30 days;
1338
1339 B) 4.0 mg/L as a daily minimum averaged over 7 days; and
1340
1341 C) 3.5 mg/L at any time.
1342
1343 c) For the Chicago Area Waterway System Aquatic Life Use A waters listed in 35
1344 Ill. Adm. Code 303.235:
1345
1346 1) during the period of March through July, 5.0 mg/L at any time; and
1347
1348 2) during the period of August through February:
1349
1350 A) 4.0 mg/L as a daily minimum averaged over 7 days; and
1351
1352 B) 3.5 mg/L at any time.
1353
1354 d) For the Chicago Area Waterway System and Brandon Pool Aquatic Life Use B
1355 waters listed in 35 Ill. Adm. Code 303.240:
1356
1357 1) 4.0 mg/L as a daily minimum averaged over 7 days; and
1358
1359 2) 3.5 mg/L at any time.
1360
1361 e) Assessing attainment of dissolved oxygen mean and minimum values.
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1363 1) Daily mean is the arithmetic mean of dissolved oxygen concentrations in
1364 24 consecutive hours.

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- 2) Daily minimum is the minimum dissolved oxygen concentration in 24 consecutive hours.
- 3) The measurements of dissolved oxygen used to determine attainment or lack of attainment with any of the dissolved oxygen standards in this Section must assure daily minima and daily means that represent the true daily minima and daily means.
- 4) The dissolved oxygen concentrations used to determine a daily mean or daily minimum should not exceed the air-equilibrated concentration.
- 5) "Daily minimum averaged over 7 days" means the arithmetic mean of daily minimum dissolved oxygen concentrations in 7 consecutive 24-hour periods.
- 6) "Daily mean averaged over 7 days" means the arithmetic mean of daily mean dissolved oxygen concentrations in 7 consecutive 24-hour periods.
- 7) "Daily mean averaged over 30 days" means the arithmetic mean of daily mean dissolved oxygen concentrations in 30 consecutive 24-hour periods.

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

Section 302.407 Chemical Constituents

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

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- 1408 c) The human health standard (HHS) for the chemical constituents listed in
 1409 subsection (f) must not be exceeded, on a 12-month rolling average based on at
 1410 least eight samples, collected in a manner representative of the sampling period,
 1411 except as provided in subsection (d).
 1412
- 1413 d) In waters where mixing is allowed under 35 Ill. Adm. Code 302.102, the
 1414 following apply:
 1415
- 1416 1) The AS must not be exceeded in any waters except for those waters for
 1417 which a zone of initial dilution (ZID) applies under 35 Ill. Adm. Code
 1418 302.102.
 - 1419 2) The CS must not be exceeded outside of waters in which mixing is
 1420 allowed under 35 Ill. Adm. Code 302.102.
 - 1421 3) The HHS must not be exceeded outside of waters in which mixing is
 1422 allowed under 35 Ill. Adm. Code 302.102.
- 1423
 1424
 1425 e) Numeric Water Quality Standards for the Protection of Aquatic Organisms
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 1427

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 B=0.9422	$e^{A+B \ln(H)} \times 0.960^*$, where A=-1.646 and B=0.8545
Cyanide**	22	10
Ethylbenzene	150	14
Fluoride (total)	$e^{A+B \ln(H)}$, where A=6.7319 and B=0.5394	$e^{A+B \ln(H)}$, but must not exceed 4.0 mg/L, where A=6.0445 and B=0.5394

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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 X 0.85*=1.2	0.77 X 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

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1430

where:

- µg/L = microgram per liter
- H = Hardness concentration of receiving water in mg/L as CaCO₃
- e^x = base of natural logarithms raised to the x-power
- ln(H) = natural logarithm of Hardness in mg/L as CaCO₃
- * = 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)

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

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

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where:

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µg/L = microgram per liter

g) Numeric Water Quality Standards for Other Chemical Constituents

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

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

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where:

- mg/L = milligram per liter
- µg/L = microgram per liter
- H = Hardness concentration of receiving water in mg/L as CaCO₃
- C = Chloride concentration of receiving water in mg/L
- e^x = base of natural logarithms raised to the x-power
- ln(H) = natural logarithm of Hardness in milligrams per liter
- * = conversion factor multiplier for dissolved metals

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1449 Beginning July 1, 2018, the following concentration for Chloride must not
1450 be exceeded except in waters for which mixing is allowed under 35 Ill.
1451 Adm. Code 302.102:
1452

Constituent	Unit	Standard
Chloride	mg/L	500

1453
1454 where:
1455

mg/L = milligram per liter

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1457 h) Concentrations of other chemical constituents in the South Fork of the South
1458 Branch of the Chicago River (Bubbly Creek) must not exceed the following
1459 standards:
1460

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

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

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

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

where:

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

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

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

T = Temperature in degrees Celsius

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

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

Section 302.408 Temperature

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

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- c) There must not be abnormal temperature changes that may adversely affect aquatic life unless caused by natural conditions.
- d) The normal daily and seasonal temperature fluctuations that existed before the addition of heat due to other than natural causes must be maintained.
- e) The maximum temperature rise above natural temperatures must never exceed 2.8 °C (5 °F).
- f) Water temperature at representative locations in the main river must never exceed the maximum limits in the applicable table in subsections (g), (h) and (i), during more than one percent of the hours in the 12-month period ending with any month. The water temperature must not exceed the maximum limits in the applicable table that follows by more than 1.7 °C (3.0 °F).
- g) Water temperature in the Chicago Area Waterway System Aquatic Life Use A waters listed in 35 Ill. Adm. Code 303.235 must not exceed the limits in the following table in compliance with subsection (f):

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

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

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

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

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

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

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

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

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

Section 302.410 Other Toxic Substances

Any substance or combination of substances toxic to aquatic life not listed in Section 302.407 must not exceed one-half of the 96-hour median tolerance limit (96-hour TL_m) for native fish or essential fish food organisms in the South Fork of the South Branch of the Chicago River (Bubbly Creek). All other Chicago Area Waterway System and Lower Des Plaines River waters as designated in 35 Ill. Adm. Code 303 must be free from any substances or combination of substances in concentrations toxic or harmful to human health, or to animal, plant or aquatic life. Individual chemical substances or parameters for which numeric standards are specified in this Subpart are not subject to this Section.

- a) Any substance or combination of substances will be deemed to be toxic or harmful to aquatic life if present in concentrations that exceed the following:
 - 1) An Acute Aquatic Toxicity Criterion (AATC) validly derived and correctly applied under procedures in 35 Ill. Adm. Code 302.612 through 302.618 or in 35 Ill. Adm. Code 302.621; or
 - 2) A Chronic Aquatic Toxicity Criterion (CATC) validly derived and correctly applied under procedures in 35 Ill. Adm. Code 302.627 or 302.630.

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

- c) Any substance or combination of substances will be deemed to be toxic or harmful to human health if present in concentrations that exceed criteria, validly derived and correctly applied, based on either of the following:
 - 1) Disease or functional impairment due to a physiological mechanism for which there is a threshold dose below which no damage occurs calculated under 35 Ill. Adm. Code 302.642 through 302.648 (Human Threshold Criterion); or
 - 2) Disease or functional impairment due to a physiological mechanism for which any dose may cause some risk of damage calculated under 35 Ill. Adm. Code 302.651 through 302.658 (Human Nonthreshold Criterion).

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- 1569 d) The most stringent criterion of subsections (a), (b) and (c) applies at all points
1570 outside of any waters within which, mixing is allowed under 35 Ill. Adm. Code
1571 302.102. In addition, the AATC derived under subsection (a)(1) applies in all
1572 waters except that it must not apply within a ZID that is prescribed in compliance
1573 with 35 Ill. Adm. Code 302.102.
1574
- 1575 e) The procedures of Subpart F set forth minimum data requirements, appropriate
1576 test protocols, and data assessment methods for establishing criteria under
1577 subsections (a), (b) and (c). No other procedures may be used to establish such
1578 criteria unless approved by the Board in a rulemaking or adjusted standard
1579 proceeding under Title VII of the Act. The validity and applicability of the
1580 Subpart F procedures may not be challenged in any proceeding brought under
1581 Title VIII or X of the Act, although the validity and correctness of application of
1582 the numeric criteria derived under Subpart F may be challenged in the
1583 proceedings under subsection (f).
1584
- 1585 f) Agency derived criteria may be challenged as follows:
1586
- 1587 1) A permittee may challenge the validity and correctness of application of a
1588 criterion derived by the Agency under this Section only at the time the
1589 criterion is first applied in an NPDES permit under 35 Ill. Adm. Code
1590 309.152 or in an action under Title VIII of the Act for violation of the
1591 toxicity water quality standard. Failure of a person to challenge the
1592 validity of a criterion at the time of its first application constitutes a waiver
1593 of the challenge in any subsequent proceeding involving application of the
1594 criterion to that person.
1595
- 1596 2) Consistent with subsection (f)(1), if a criterion is included as, or is used to
1597 derive, a condition of an NPDES discharge permit, a permittee may
1598 challenge the criterion in a permit appeal under Section 40 of the Act and
1599 35 Ill. Adm. Code 309.181. In any such action, the Agency must include
1600 in the record all information upon which it has relied in developing and
1601 applying the criterion, whether that information was developed by the
1602 Agency or submitted by the Petitioner. The burden of proof is on the
1603 Petitioner to demonstrate that the criterion-based condition is not
1604 necessary to accomplish the purposes of subsection (f)(1) (see Section
1605 40(a)(1) of the Act), but there is no presumption in favor of the general
1606 validity and correctness of the application of the criterion as reflected in
1607 the challenged condition.
1608
- 1609 3) Consistent with subsection (f)(1), in an action in which alleged violation
1610 of the toxicity water quality standard is based on alleged excursion of a
1611 criterion, the person bringing the action has the burdens of going forward

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1612 with proof and of persuasion regarding the general validity and correctness
1613 of application of the criterion.
1614

1615 g) Subsections (a) through (e) do not apply to USEPA registered pesticides approved
1616 for aquatic application and applied under the following conditions:

- 1617
- 1618 1) Application must be made in strict compliance with label directions;
 - 1619
 - 1620 2) Applicator must be properly certified under the provisions of the Federal
1621 Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 135 et seq. (1972));
1622 and
 - 1623
 - 1624 3) Applications of aquatic pesticides must comply with the laws, regulations
1625 and guidelines of all state and federal agencies authorized by law to
1626 regulate, use or supervise pesticide applications.
1627

1628 (Source: Amended at 46 Ill. Reg. _____, effective _____)
1629

1630 **Section 302.412 Total Ammonia Nitrogen**

1631

- 1632 a) This Section does not apply to the South Fork of the South Branch of the Chicago
1633 River (Bubbly Creek).
1634

- 1635 b) For the Chicago Area Waterway System and the Lower Des Plaines River
1636 described in 35 Ill. Adm. Code 303.204 and listed in 35 Ill. Adm. Code 303.220
1637 through 303.240, total ammonia nitrogen must in no case exceed 15 mg/L.
1638

- 1639 c) The total ammonia nitrogen acute, chronic, and sub-chronic standards are
1640 determined in compliance with the equations in subsections (c)(1) and (c)(2).
1641 Attainment of each standard must be determined in compliance with subsections
1642 (d) and (e) in mg/L.

- 1643
- 1644 1) The acute standard (AS) is calculated using the following equation:
1645

1646

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

1647

- 1648 2) The chronic standard (CS) is calculated using the following equations:
1649

- 1650 A) During the Early Life Stage Present period, as defined in
1651 subsection (f):

- 1652
- 1653 i) When water temperature is less than or equal to 14.51 °C:

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1654

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

1655
1656

ii) When water temperature is above 14.51 °C:

1657
1658

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

1659
1660
1661
1662

where:

T = Water Temperature, degrees Celsius

1663
1664
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1668

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

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

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

1669
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1672

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

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

1673
1674
1675
1676

Where:

T = Water Temperature, degrees Celsius

1677
1678
1679

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

1680
1681

d) Attainment of the Total Ammonia Nitrogen Water Quality Standards

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1685

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

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1688

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

1689 chronic standard (CS) is determined in compliance with subsection (e) by
1690 averaging at least four samples collected at weekly intervals or at other
1691 sampling intervals that statistically represent a 30-day sampling period.
1692 The samples must be collected in a manner that assures a representative
1693 sampling period.
1694

1695 3) The 4-day average concentration of total ammonia nitrogen (in mg/L)
1696 must not exceed the sub-chronic standard except in those waters in which
1697 mixing is allowed under 35 Ill. Adm. Code 302.102. Attainment of the
1698 sub-chronic standard is determined in compliance with subsection (e) by
1699 averaging daily sample results collected over a period of four consecutive
1700 days within the 30-day averaging period. The samples must be collected
1701 in a manner that assures a representative sampling period.
1702

1703 e) The water quality standard for each water body must be calculated based on the
1704 temperature and pH of the water body measured at the time of each ammonia
1705 sample. The concentration of total ammonia in each sample must be divided by
1706 the calculated water quality standard for the sample to determine a quotient. The
1707 water quality standard is attained if the mean of the sample quotients is less than
1708 or equal to one for the duration of the averaging period.
1709

1710 f) The Early Life Stage Present period occurs from March through October. All
1711 other periods are subject to the Early Life Stage Absent period, except that waters
1712 listed in 35 Ill. Adm. Code 303.240 are not subject to Early Life Stage Present
1713 ammonia limits at any time.
1714

1715 BOARD NOTE: Acute and chronic standard concentrations for total ammonia nitrogen
1716 (in mg/L) for different combinations of pH and temperature are shown in Appendix C.

1717 (Source: Amended at 46 Ill. Reg. _____, effective _____)
1718

1719
1720 **SUBPART E: LAKE MICHIGAN BASIN WATER QUALITY STANDARDS**
1721

1722 **Section 302.501 Scope, Applicability, and Definitions**
1723

1724 a) Subpart E contains the Lake Michigan Basin water quality standards. These must
1725 be met in the waters of the Lake Michigan Basin as designated in 35 Ill. Adm.
1726 Code 303.443.
1727

1728 b) In addition to the definitions provided at 35 Ill. Adm. Code 301.200 through
1729 301.444, and in place of conflicting definitions at 35 Ill. Adm. Code 302.100, the
1730 following terms have the meanings specified for the Lake Michigan Basin:
1731

1732 "Acceptable daily exposure" or "ADE" means an estimate of the

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1733 maximum daily dose of a substance that is not expected to result in
1734 adverse noncancer effects to the general human population, including
1735 sensitive subgroups.
1736
1737 "Acceptable endpoints", for the purpose of deriving wildlife criteria,
1738 means acceptable subchronic and chronic endpoints that affect
1739 reproductive or developmental success, organismal viability or growth, or
1740 any other endpoint that is, or is directly related to, parameters that
1741 influence population dynamics.
1742
1743 "Acute to chronic ratio" or "ACR" is the standard measure of the acute
1744 toxicity of a material divided by an appropriate measure of the chronic
1745 toxicity of the same material under comparable conditions.
1746
1747 "Acute toxicity" means adverse effects that result from an exposure period
1748 that is a small portion of the life span of the organism.
1749
1750 "Adverse effect" means any deleterious effect to organisms due to
1751 exposure to a substance. This includes effects that are or may become
1752 debilitating, harmful or toxic to the normal functions of the organism, but
1753 does not include non-harmful effects such as tissue discoloration alone or
1754 the induction of enzymes involved in the metabolism of the substance.
1755
1756 "Baseline BAF" for organic chemicals, means a BAF that is based on the
1757 concentration of freely dissolved chemical in the ambient water and takes
1758 into account the partitioning of the chemical within the organism; for
1759 inorganic chemicals, a BAF is based on the wet weight of the tissue.
1760
1761 "Baseline BCF" for organic chemicals, means a BCF that is based on the
1762 concentration of freely dissolved chemical in the ambient water and takes
1763 into account the partitioning of the chemical within the organism; for
1764 inorganic chemicals, a BAF is based on the wet weight of the tissue.
1765
1766 "Bioaccumulative chemical of concern" or "BCC" is any chemical that has
1767 the potential to cause adverse effects and that, upon entering the surface
1768 waters, by itself or as its toxic transformation product, accumulates in
1769 aquatic organisms by a human health bioaccumulation factor greater than
1770 1,000, after considering metabolism and other physiochemical properties
1771 that might enhance or inhibit bioaccumulation, in compliance with the
1772 methodology in 35 Ill. Adm. Code 302.570. In addition, the half life of
1773 the chemical in the water column, sediment or biota must be greater than
1774 eight weeks. BCCs include the following substances:
1775
1776 Chlordane

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1777	
1778	4,4'-DDD; p,p'-DDD; 4,4'-TDE; p,p'-TDE
1779	
1780	4,4'-DDE; p,p'-DDE
1781	
1782	4,4'-DDT; p,p'-DDT
1783	
1784	Dieldrin
1785	
1786	Hexachlorobenzene
1787	
1788	Hexachlorobutadiene; Hexachloro-1,3-butadiene
1789	
1790	Hexachlorocyclohexanes; BHCs
1791	
1792	alpha-Hexachlorocyclohexane; alpha-BHC
1793	
1794	beta-Hexachlorocyclohexane; beta-BHC
1795	
1796	delta-Hexachlorocyclohexane; delta-BHC
1797	
1798	Lindane; gamma-Hexachlorocyclohexane; gamma-BHC
1799	
1800	Mercury
1801	
1802	Mirex
1803	
1804	Octachlorostyrene
1805	
1806	PCBs; polychlorinated biphenyls
1807	
1808	Pentachlorobenzene
1809	
1810	Photomirex
1811	
1812	2,3,7,8-TCDD; Dioxin
1813	
1814	1,2,3,4-Tetrachlorobenzene
1815	
1816	1,2,4,5-Tetrachlorobenzene
1817	
1818	Toxaphene
1819	
1820	"Bioaccumulation" is the net accumulation of a substance by an organism

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1821 as a result of uptake from all environmental sources.
1822
1823 "Bioaccumulation factor" or "BAF" is the ratio (in L/kg) of a substance's
1824 concentration in the tissue of an aquatic organism to its concentration in
1825 the ambient water, in situations where both the organism and its food are
1826 exposed and the ratio does not change substantially over time.
1827
1828 "Bioconcentration" means the net accumulation of a substance by an
1829 aquatic organism as a result of uptake directly from the ambient water
1830 through gill membranes or other external body surfaces.
1831
1832 "Bioconcentration Factor" or "BCF" is the ratio (in L/kg) of a substance's
1833 concentration in the tissue of an aquatic organism to its concentration in
1834 the ambient water, in situations where the organism is exposed through the
1835 water only and the ratio does not change substantially over time.
1836
1837 "Biota-sediment accumulation factor" or "BSAF" means the ratio (in kg of
1838 organic carbon/kg of lipid) of a substance's lipid-normalized concentration
1839 in the tissue of an aquatic organism to its organic carbon-normalized
1840 concentration in surface sediment, in situations where the ratio does not
1841 change substantially over time, both the organism and its food are
1842 exposed, and the surface sediment is representative of average surface
1843 sediment in the vicinity of the organism.
1844
1845 "Carcinogen" means a substance that causes an increased incidence of
1846 benign or malignant neoplasms, or substantially decreases the time to
1847 develop neoplasms, in animals or humans. The classification of
1848 carcinogens is determined by the procedures in Section II.A of Appendix
1849 C to 40 CFR 132, incorporated by reference in 35 Ill. Adm. Code 301.106.
1850
1851 "Chronic effect" means an adverse effect that is measured by assessing an
1852 acceptable endpoint, and results from continual exposure over several
1853 generations, or at least over a significant part of the test species' projected
1854 life span or life stage.
1855
1856 "Chronic toxicity" means adverse effects that result from an exposure
1857 period that is a large portion of the life span of the organism.
1858
1859 "Dissolved organic carbon" or "DOC" means organic carbon that passes
1860 through a 1 µm pore size filter.
1861
1862 "Dissolved metal" means the concentration of a metal that will pass
1863 through a 0.45 µm pore size filter.
1864

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1865 "Food chain" means the energy stored by plants is passed along through
1866 the ecosystem through trophic levels in a series of steps of eating and
1867 being eaten, also known as a food web.
1868

1869 "Food chain multiplier" or "FCM" means the ratio of a BAF to an
1870 appropriate BCF.
1871

1872 "Linearized multi-stage model" means a mathematical model for cancer
1873 risk assessment. This model fits linear dose-response curves to low doses.
1874 It is consistent with a no-threshold model of carcinogenesis.
1875

1876 "Lowest observed adverse effect level" or "LOAEL" means the lowest
1877 tested dose or concentration of a substance that results in an observed
1878 adverse effect in exposed test organisms when all higher doses or
1879 concentrations result in the same or more severe effects.
1880

1881 "No observed adverse effect level" or "NOAEL" means the highest tested
1882 dose or concentration of a substance that results in no observed adverse
1883 effect in exposed test organisms where higher doses or concentrations
1884 result in an adverse effect.
1885

1886 "Octanol water partition coefficient" or "Kow" is the ratio of the
1887 concentration of a substance in the n-octanol phase to its concentration in
1888 the aqueous phase in an equilibrated two-phase octanol water system. For
1889 log Kow, the log of the octanol water partition coefficient is a base 10
1890 logarithm.
1891

1892 "Open Waters of Lake Michigan" means all of the waters within Lake
1893 Michigan in Illinois jurisdiction lakeward from a line drawn across the
1894 mouth of tributaries to Lake Michigan, but not including waters enclosed
1895 by constructed breakwaters.
1896

1897 "Particulate organic carbon" or "POC" means organic carbon that is
1898 retained by a 1 µm pore size filter.
1899

1900 "Relative source contribution" or "RSC" means the percent of total
1901 exposure that can be attributed to surface water through water intake and
1902 fish consumption.
1903

1904 "Resident or indigenous species" means species that currently live a
1905 substantial portion of their life cycle, or reproduce, in a given body of
1906 water, or that are native species whose historical range includes a given
1907 body of water.
1908

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1910	
1911	
1912	"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.
1913	
1914	
1915	"Slope factor" or "q ₁ *" is the incremental rate of cancer development calculated through use of a linearized multistage model or other appropriate model. It is expressed in mg/kg/day of exposure to the chemical in question.
1916	
1917	
1918	
1919	
1920	"Standard Methods" means "Standard Methods for the Examination of Water and Wastewater", available from the American Public Health Association.
1921	
1922	
1923	
1924	"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.
1925	
1926	
1927	"Target species" is a species to be protected by the criterion.
1928	
1929	"Target species value" is the criterion value for the target species.
1930	
1931	"Test species" is a species that has test data available to derive a criterion.
1932	
1933	"Test dose" or "TD" is a LOAEL or NOAEL for the test species.
1934	
1935	
1936	"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.
1937	
1938	
1939	
1940	"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.
1941	
1942	
1943	
1944	
1945	
1946	"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.
1947	
1948	
1949	
1950	
1951	"Toxic unit acute" or "TU _a " is the reciprocal of the effluent concentration that causes 50 percent of the test organisms to die by the end of the acute exposure period, which is 48 hours for invertebrates and 96 hours for
1952	

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1953 vertebrates.

1954
1955 "Toxic unit chronic" or "TU_c" is the reciprocal of the effluent
1956 concentration that causes no observable effect on the test organisms by the
1957 end of the chronic exposure period, which is at least seven days for
1958 Ceriodaphnia, fathead minnow and rainbow trout.

1959
1960 "Uncertainty factor" or "UF" is one of several numeric factors used in
1961 deriving criteria from experimental data to account for the quality or
1962 quantity of the available data.

1963
1964 "USEPA" means United States Environmental Protection Agency.

1965
1966 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1967

1968 **Section 302.502 Dissolved Oxygen**

1969
1970 Dissolved oxygen must not be less than 90% of saturation, except due to natural causes, in the
1971 Open Waters of Lake Michigan as defined at 35 Ill. Adm. Code 302.501. The other waters of the
1972 Lake Michigan Basin must not be less than 6.0 mg/L during at least 16 hours of any 24 hour
1973 period, nor less than 5.0 mg/L at any time.

1974
1975 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1976

1977 **Section 302.503 pH**

1978
1979 pH must be within the range of 7.0 to 9.0, except for natural causes, in the Open Waters of Lake
1980 Michigan as defined at 35 Ill. Adm. Code 302.501. Other waters of the Basin must be within the
1981 range of 6.5 to 9.0, except for natural causes.

1982
1983 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1984

1985 **Section 302.504 Chemical Constituents**

1986
1987 The following concentrations of chemical constituents must not be exceeded, except as provided
1988 in 35 Ill. Adm. Code 302.102 and 302.530:

1989
1990 a) The following standards must be met in all waters of the Lake Michigan Basin.
1991 Acute aquatic life standards (AS) must not be exceeded at any time except for
1992 those waters for which the Agency has approved a zone of initial dilution (ZID)
1993 under 35 Ill. Adm. Code 302.102 and 302.530. Chronic aquatic life standards
1994 (CS) and human health standards (HHS) must not be exceeded outside of waters
1995 in which mixing is allowed under 35 Ill. Adm. Code 302.102 and 302.530 by the
1996 arithmetic average of at least four consecutive samples collected over a period of

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1997 at least four days. The samples used to demonstrate compliance with the CS or
 1998 HHS must be collected in a manner which assures an average representation of
 1999 the sampling period.
 2000

<u>Constituent</u>	<u>Unit</u>	<u>AS</u>	<u>CS</u>	<u>HHS</u>
Arsenic (Trivalent, dissolved)	µg/L	$340 \times 1.0^* = 340$	$148 \times 1.0^* = 148$	NA
Boron (total)	mg/L	40.1	7.6	NA
Cadmium (dissolved)	µg/L	$\exp[A + B \ln(H)] \times \{1.138672 - [(1nH)(0.041838)]\}^*$ where $A = -3.6867$ and $B = 1.128$	$\exp[A + B \ln(H)] \times \{1.101672 - [(1nH)(0.041838)]\}^*$ where $A = -2.715$ and $B = 0.7852$	NA
Chromium (Hexavalent, total)	µg/L	16	11	NA
Chromium (Trivalent, dissolved)	µg/L	$\exp[A + B \ln(H)] \times 0.316^*$ where $A = 3.7256$ and $B = 0.819$	$\exp[A + B \ln(H)] \times 0.860^*$ where $A = 0.6848$ and $B = 0.819$	NA
Copper (dissolved)	µg/L	$\exp[A + B \ln(H)] \times 0.960^*$ where $A = -1.700$ and $B = 0.9422$	$\exp[A + B \ln(H)] \times 0.960^*$ where $A = -1.702$ and $B = 0.8545$	NA
Cyanide**	µg/L	22	5.2	NA
Fluoride (total)	µg/L	$\exp[A + B \ln(H)]$ where $A = 6.7319$ and $B = 0.5394$	$\exp[A + B \ln(H)]$, but must not exceed 4.0 mg/L where $A = 6.0445$ and $B = 0.5394$	NA

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Lead (dissolved)	µg/L	$\exp[A + B \ln(H)] \times \{1.46203 - [(1nH) (0.145712)]\}^*$ where $A = -1.055$ and $B = 1.273$	$\exp[A + B \ln(H)] \times \{1.46203 - [(1nH) (0.145712)]\}^*$ where $A = -4.003$ and $B = 1.273$	NA
Manganese (dissolved)	µg/L	$\exp[A + B \ln(H)] \times 0.9812^*$ where $A = 4.9187$ and $B = 0.7467$	$\exp[A + B \ln(H)] \times 0.9812^*$ where $A = 4.0635$ and $B = 0.7467$	NA
Nickel (dissolved)	µg/L	$\exp[A + B \ln(H)] \times 0.998^*$ where $A = 2.255$ and $B = 0.846$	$\exp[A + B \ln(H)] \times 0.997^*$ where $A = 0.0584$ and $B = 0.846$	NA
Selenium (dissolved)	µg/L	NA	5.0	NA
TRC	µg/L	19	11	NA
Zinc (dissolved)	µg/L	$\exp[A + B \ln(H)] \times 0.978^*$ where $A = 0.884$ and $B = 0.8473$	$\exp[A + B \ln(H)] \times 0.986^*$ where $A = 0.884$ and $B = 0.8473$	NA
Benzene	µg/L	3900	800	310
Chlorobenzene	mg/L	NA	NA	3.2
2,4-Dimethylphenol	mg/L	NA	NA	8.7
2,4-Dinitrophenol	mg/L	NA	NA	2.8
Endrin	µg/L	0.086	0.036	NA
Ethylbenzene	µg/L	150	14	NA

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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

2001

where:

NA = Not Applied

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

$\ln(H)$ = natural logarithm of Hardness in mg/L as CaCO₃

* = 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).

2002

2003

2004

2005

2006

- 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).

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

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

2007
2008
2009
2010
2011

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

<u>Constituent</u>	<u>Unit</u>	<u>Water Quality Standard</u>
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

2012
2013
2014
2015
2016
2017
2018

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

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2019

<u>Constituent</u>	<u>Unit</u>	<u>Water Quality Standard</u>
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

2020

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

<u>Constituent</u>	<u>Unit</u>	<u>AS</u>	<u>CS</u>	<u>HHS</u>	<u>WS</u>
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

2031

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

2032

2033

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

2034

Section 302.505 Fecal Coliform

2036

2037 Based on a minimum of five samples taken over not more than a 30-day period, fecal coliform
2038 must not exceed a geometric mean of 20 per 100 ml in the Open Waters of Lake Michigan as
2039 defined in 35 Ill. Adm. Code 302.501. The remaining waters of the Lake Michigan Basin must
2040 not exceed a geometric mean of 200 per 100 ml, nor shall more than 10% of the samples during
2041 any 30 day period exceed 400 per 100 ml.

2042

2043

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

2044

Section 302.506 Temperature

2046

2047 a) The owner or operator of a source of heated effluent must maintain such records
2048 and conduct such studies of the effluents from the source and its effects as may be
2049 required by the Agency or in any permit granted under the Act.

2050

2051 b) Backfitting of alternative cooling facilities will be required if, upon complaint
2052 filed in compliance with Board rules, it is found at any time that any heated
2053 effluent causes significant ecological damage to the Lake.

2054

2055

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

2056

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

2058

2059 All sources of heated effluents in existence as of January 1, 1971, must meet the following
2060 restrictions outside of a mixing zone which must be no greater than a circle with a radius of 305
2061 m (1000 feet) or an equal fixed area of simple form.

2062

2063 a) There must be no abnormal temperature changes that may affect aquatic life.

2064

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- 2065 b) The normal daily and seasonal temperature fluctuations that existed before the
2066 addition of heat must be maintained.
2067
2068 c) The maximum temperature rise at any time above natural temperatures must not
2069 exceed 1.7 °C (3 °F). In addition, the water temperature must not exceed the
2070 maximum limits indicated in the following table:
2071

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

2072
2073 (Source: Amended at 46 Ill. Reg. _____, effective _____)
2074

2075 **Section 302.508 Thermal Standards for Sources Under Construction But Not In Operation** 2076 **on January 1, 1971**

2077
2078 Any effluent source under construction but not in operation on January 1, 1971 must meet all the
2079 requirements of 35 Ill. Adm. Code 302.507 and in addition must meet the following restrictions:
2080

- 2081 a) The bottom, the shore, the hypolimnion, and the thermocline must not be affected
2082 by any heated effluent.
2083
2084 b) Heated effluent must not affect spawning grounds or fish migration routes.
2085
2086 c) Discharge structures must be designed to maximize short-term mixing and thus to
2087 reduce the area significantly raised in temperature.
2088
2089 d) Discharge must not exceed ambient temperatures by more than 11 °C (20 °F).
2090
2091 e) Heated effluents from more than one source must not interact.
2092
2093 f) All reasonable steps must be taken to reduce the number of organisms drawn into
2094 or against the intakes.
2095

2096 (Source: Amended at 46 Ill. Reg. _____, effective _____)
2097

2098 **Section 302.509 Other Sources**

- 2099
2100 a) A source of heated effluent which was not in operation or under construction as of

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2101 January 1, 1971, must not discharge more than a daily average of 29 megawatts
2102 (0.1 billion British thermal units per hour).

2103
2104 b) Sources of heated effluents which discharge less than a daily average of 29
2105 megawatts (0.1 billion British thermal units per hour) not in operation or under
2106 construction as of January 1, 1971, must meet all requirements of 35 Ill. Adm.
2107 Code 302.507 and 302.508.

2108
2109 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2110 **Section 302.510 Incorporations by Reference (Repealed)**

2111
2112 (Source: Repealed at 46 Ill. Reg. _____, effective _____)

2113 **Section 302.515 Offensive Conditions**

2114
2115 Waters of the Lake Michigan Basin must be free from sludge or bottom deposits, floating debris,
2116 visible oil, odor, plant or algal growth, color or turbidity of other than natural origin. The
2117 allowed mixing provisions of 35 Ill. Adm. Code 302.102 must not be used to comply with the
2118 provisions of this Section.

2119
2120 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2121 **Section 302.520 Regulation and Designation of Bioaccumulative Chemicals of Concern (BCCs)**

2122
2123 a) For regulating BCCs in compliance with 35 Ill. Adm. Code 302.521 and 302.530,
2124 the following chemicals must be considered as BCCs:

2125
2126 1) any chemical or class of chemicals listed as a BCC in 35 Ill. Adm. Code
2127 302.501; and

2128
2129 2) any chemical or class of chemicals that the Agency has determined meets
2130 the characteristics of a BCC as defined in 35 Ill. Adm. Code 302.501 as
2131 indicated by:

2132
2133 A) publication in the Illinois Register; or
2134
2135 B) notification to a permittee or applicant; or

2136
2137 C) filing a petition with the Board to verify that the chemical must be
2138 designated a BCC.

2139
2140 b) Notwithstanding subsections (a)(2)(A) and (B), a chemical must not be regulated

2145 as a BCC if the Agency has not filed a petition, within 60 days after such
2146 publication or notification, with the Board in compliance with Section 28.2 of the
2147 Act to verify that the chemical must be designated a BCC.
2148

2149 c) Under subsection (b) and 35 Ill. Adm. Code 302.570, if the Board verifies that a
2150 chemical has a human health bioaccumulation factor greater than 1,000 and is
2151 consistent with the definition of a BCC in 35 Ill. Adm. Code 302.501, the Board
2152 must designate the chemical as a BCC and list the chemical in 35 Ill. Adm. Code
2153 302.501. If the Board fails to verify the chemical as a BCC in its final action on
2154 the verification petition, the chemical must not be listed as a BCC and must not be
2155 regulated as a BCC in compliance with 35 Ill. Adm. Code 302.521 and 302.530.
2156

2157 (Source: Amended at 46 Ill. Reg. _____, effective _____)
2158

2159 **Section 302.521 Supplemental Antidegradation Provisions for BCCs**
2160

2161 a) Notwithstanding the provisions of 35 Ill. Adm. Code 302.105, waters within the
2162 Lake Michigan Basin must not be lowered in quality due to new or increased
2163 loading of substances defined as BCCs in 35 Ill. Adm. Code 302.501 from any
2164 source or activity subject to the NPDES permitting, Section 401 water quality
2165 certification provisions of the Clean Water Act (P.L. 92-100, as amended), or
2166 joint permits from the Agency and the Illinois Department of Natural Resources
2167 under Section 39(n) of the Act [415 ILCS 5/39(n)] until and unless it can be
2168 affirmatively demonstrated that such change is necessary to accommodate
2169 important economic or social development.
2170

2171 1) Where ambient concentrations of a BCC are equal to or exceed an
2172 applicable water quality criterion, no increase in loading of that BCC is
2173 allowed.
2174

2175 2) Where ambient concentrations of a BCC are below the applicable water
2176 quality criterion, a demonstration to justify increased loading of that BCC
2177 must include the following:
2178

2179 A) Pollution Prevention Alternatives Analysis. Identify any cost-
2180 effective reasonably available pollution prevention alternatives and
2181 techniques that would eliminate or significantly reduce the extent
2182 of increased loading of the BCC.
2183

2184 B) Alternative or Enhanced Treatment Analysis. Identify alternative
2185 or enhanced treatment techniques that are cost effective and
2186 reasonably available to the entity that would eliminate or
2187 significantly reduce the extent of increased loading of the BCC.
2188

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2232
- C) Important Social or Economic Development Analysis. Identify the social or economic development and the benefits that would be forgone if the increased loading of the BCC is not allowed.
 - 3) In no case will increased loading of BCCs result in exceeding applicable water quality criteria or concentrations exceeding the level of water quality necessary to protect existing uses.
 - 4) Changes in loadings of any BCC within the existing capacity and processes of an existing NPDES authorized discharge, certified activity under Section 401 of the Clean Water Act, or joint permits from the Agency and the Illinois Department of Natural Resources under Section 39(n) of the Act are not subject to the antidegradation review of subsection (a). These changes include:
 - A) normal operational variability, including intermittent increased discharges due to wet weather conditions;
 - B) changes in intake water pollutants;
 - C) increasing the production hours of the facility; or
 - D) increasing the rate of production.
 - 5) Any determination to allow increased loading of a BCC based on a demonstration of important economic or social development need must satisfy the public participation requirements of 40 CFR 25 prior to final issuance of the NPDES permit, Section 401 water quality certification, or joint permits from the Agency and the Illinois Department of Natural Resources under Section 39(n) of the Act.
 - b) The following actions are not subject to the provisions of subsection (a), unless the Agency determines the circumstances of an individual situation warrant application of those provisions to adequately protect water quality:
 - 1) Short-term, temporary (i.e., weeks or months) lowering of water quality;
 - 2) Bypasses that are not prohibited at 40 CFR 122.41(m), incorporated by reference in 35 Ill. Adm. Code 301.106; or
 - 3) Response actions under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, or similar federal or State authority, undertaken to alleviate a release into the environment of hazardous substances, pollutants or contaminants that pose

2233 danger to public health or welfare.

2234

2235 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2236

2237 **Section 302.525 Radioactivity**

2238

2239 Except as provided in 35 Ill. Adm. Code 302.102, all waters of the Lake Michigan Basin must
2240 meet the following concentrations:

2241

2242 a) Gross beta concentrations must not exceed 100 picocuries per liter (pCi/L).

2243

2244 b) Strontium 90 concentration must not exceed 2 picocuries per liter (pCi/L).

2245

2246 c) The annual average radium 226 and 228 combined concentration must not exceed
2247 3.75 picocuries per liter (pCi/L).

2248

2249 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2250

2251 **Section 302.530 Supplemental Mixing Provisions for Bioaccumulative Chemicals of**
2252 **Concern (BCCs)**

2253

2254 The Allowed Mixing, Mixing Zones, and ZIDs provisions of 35 Ill. Adm. Code 302.102 apply
2255 within the Lake Michigan Basin except as otherwise provided for substances defined as BCCs in
2256 35 Ill. Adm. Code 302.501:

2257

2258 a) Mixing is not allowed for BCCs for new discharges commencing on or after
2259 December 24, 1997.

2260

2261 b) Discharges of BCCs existing as of December 24, 1997 are eligible for mixing
2262 allowance consistent with 35 Ill. Adm. Code 302.102 until March 23, 2007. After
2263 March 23, 2007 mixing for BCCs will not be allowed except as provided in
2264 subsections (c) and (d).

2265

2266 c) Mixing allowance for a source in existence on December 24, 1997 may continue
2267 beyond March 23, 2007 where it can be demonstrated on a case by case basis that
2268 continuation of mixing allowance is necessary to achieve water conservation
2269 measures that result in overall reduction of BCC mass loading to the Lake
2270 Michigan Basin.

2271

2272 d) Mixing allowance for a source in existence on December 24, 1997 will only
2273 continue if necessitated by technical and economic factors. Any mixing allowance
2274 continued beyond March 23, 2007 based on technical and economic factors must
2275 be limited to not more than one NPDES permit term, and must reflect the
2276 maximum achievable BCC loading reduction within the identified technical and

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2277 economic considerations necessitating the exception. The continued mixing
2278 allowance must not be renewed beyond that permit term unless a new
2279 determination of technical and economic necessity is made.

2280
2281 (Source: Amended at 46 Ill. Reg. _____, effective _____)
2282

2283 **Section 302.535 Ammonia Nitrogen**

2284
2285 The Open Waters of Lake Michigan as defined in 35 Ill. Adm. Code 302.501 must not exceed
2286 0.02 mg/L total ammonia. The remaining waters of the Lake Michigan Basin are subject to the
2287 following:

- 2288
- 2289 a) Total ammonia nitrogen must in no case exceed 15 mg/L.
 - 2290
 - 2291 b) Un-ionized ammonia nitrogen must not exceed the acute and chronic standards
2292 given below subject to the provisions of 35 Ill. Adm. Code 302.208(a) and (b):
2293
 - 2294 1) From April through October, the Acute Standard (AS) must be 0.33 mg/L
2295 and the chronic standard (CS) must be 0.057 mg/L.
 - 2296
 - 2297 2) From November through March, the AS must be 0.14 mg/L and the CS
2298 must be 0.025 mg/L.
 - 2299
 - 2300 c) For this Section, the concentration of un-ionized ammonia nitrogen as N and total
2301 ammonia as N must be computed according to the following equations:
2302

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

2303
2304 and $N = U[0.94412(1 + 10^X) + 0.0559]$

2305
2306 Where:

2307

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

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.

2308
2309 (Source: Amended at 46 Ill. Reg. _____, effective _____)
2310

2311 **Section 302.540 Other Toxic Substances**

2312

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2313 Waters of the Lake Michigan Basin must be free from any substance or any combination of
2314 substances in concentrations toxic or harmful to human health, or to animal, plant or aquatic life.
2315 The numeric standards protective of particular uses specified for individual chemical substances
2316 in 35 Ill. Adm. Code 302.504 are not subject to recalculation by this Section, however, where no
2317 standard applies to a category, a numeric value may be calculated.
2318

- 2319 a) Any substance will be deemed toxic or harmful to aquatic life if present in
2320 concentrations that exceed the following:
2321
- 2322 1) A Tier I Lake Michigan Basin Acute Aquatic Life Toxicity Criterion
2323 (LMAATC) or Tier II Lake Michigan Basin Acute Aquatic Life Toxicity
2324 Value (LMAATV) derived under procedures in 35 Ill. Adm. Code
2325 302.555, 302.560 or 302.563 at any time; or
2326
 - 2327 2) A Tier I Lake Michigan Basin Chronic Aquatic Life Toxicity Criterion
2328 (LMCATC) or Tier II Lake Michigan Basin Chronic Aquatic Life
2329 Toxicity Value (LMCATV) derived under procedures in 35 Ill. Adm.
2330 Code 302.565 as an average of four samples collected on four different
2331 days.
2332
- 2333 b) Any combination of substances, including effluents, will be deemed toxic to
2334 aquatic life if present in concentrations that exceed either subsection (b)(1) or (2):
2335
- 2336 1) A sample of water from the Lake Michigan Basin collected outside of a
2337 designated zone of initial dilution must not exceed 0.3 TU_a as determined
2338 for the most sensitive species tested using acute toxicity testing methods.
2339
 - 2340 2) A sample of water from the Lake Michigan Basin collected outside a
2341 designated mixing zone must not exceed 1.0 TU_c as determined for the
2342 most sensitive species tested using chronic toxicity testing methods.
2343
 - 2344 3) To demonstrate compliance with subsections (1) and (2), at least two
2345 resident or indigenous species must be tested. The rainbow trout must be
2346 used to represent fishes for the Open Waters of Lake Michigan and the
2347 fathead minnow must represent fishes for the other waters of the Lake
2348 Michigan Basin. Ceriodaphnia must represent invertebrates for all waters
2349 of the Lake Michigan Basin. Other common species may be used if listed
2350 in Table I (a) of 40 CFR 136, incorporated by reference at 35 Ill. Adm.
2351 Code 301.106, and approved by the Agency.
2352
- 2353 c) Any substance must be deemed toxic or harmful to wildlife if present in
2354 concentrations that exceed a Tier I Lake Michigan Basin Wildlife Criterion
2355 (LMWLC) derived under procedures in 35 Ill. Adm. Code 302.575 as an
2356 arithmetic average of four samples collected over four different days.

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- d) For any substance that is a threat to human health through drinking water exposure only, the resulting criterion or value must apply to only the Open Waters of Lake Michigan. For any substance that is determined to be a BCC, the resulting criterion must apply in the entire Lake Michigan Basin. These substances must be deemed toxic or harmful to human health if present in concentrations that exceed either of the following:
 - 1) A Tier I Lake Michigan Basin Human Health Threshold Criterion (LMHHTC) or Tier II Lake Michigan Basin Human Health Threshold Value (LMHHTV) based on disease or functional impairment due to a physiological mechanism for which there is a threshold dose below which no damage occurs as derived under procedures in 35 Ill. Adm. Code 302.585 as an arithmetic average of four samples collected over four different days; or
 - 2) A Tier I Lake Michigan Basin Human Health Nonthreshold Criterion (LMHHNC) or Tier II Lake Michigan Basin Human Health Nonthreshold Value (LMHHNV) based on disease or functional impairment due to a physiological mechanism for which any dose may cause some risk of damage as derived under procedures in 35 Ill. Adm. Code 302.590 as an arithmetic average of four samples collected over four different days.
 - e) The derived criteria and values apply at all points outside of any waters in which mixing is allowed under 35 Ill. Adm. Code 302.102 or 302.530.
 - f) The procedures of this Subpart E set forth minimum data requirements, appropriate test protocols and data assessment methods for establishing criteria or values under subsections (b), (c), and (d). No other procedures may be used to establish such criteria or values unless approved by the Board in a rulemaking or adjusted standards proceeding under Title VII of the Act. The validity and applicability of these procedures may not be challenged in any proceeding brought under Title VIII or X of the Act, although the validity and correctness of application of the numeric criteria or values derived under this Subpart may be challenged in such proceedings under subsection (g).
 - g) Challenges to application of criteria and values.
 - 1) A permittee may challenge the validity and correctness of application of a criterion or value derived by the Agency under this Section only at the time such criterion or value is first applied in its NPDES permit under 35 Ill. Adm. Code 309.152 or in an action under Title VIII of the Act for violation of the toxicity water quality standard. Failure of a person to challenge the validity of a criterion or value at the time of its first

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- 2401 application to that person's facility constitutes a waiver of a challenge in
2402 any subsequent proceeding involving application of the criterion or value
2403 to that person.
2404
- 2405 2) Consistent with subsection (g)(1), if a criterion or value is included as, or
2406 is used to derive, a condition of an NPDES discharge permit, a permittee
2407 may challenge the criterion or value in a permit appeal under 35 Ill. Adm.
2408 Code 309.181.
2409
- 2410 3) Consistent with subsection (g)(1), in an action where alleged violation of
2411 the toxicity water quality standard is based on alleged excursion of a
2412 criterion or value, the person bringing the action has the burdens of going
2413 forward with proof and persuasion regarding the general validity and
2414 correctness of application of the criterion or value.
2415
- 2416 h) Subsections (a) through (e) do not apply to USEPA registered pesticides approved
2417 for aquatic application and applied under the following conditions:
2418
- 2419 1) Application must be made in strict compliance with label directions;
2420
- 2421 2) Applicator must be properly certified under the provisions of the Federal
2422 Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 135 et seq. (1972));
2423
- 2424 3) Applications of aquatic pesticides must comply with the laws, regulations
2425 and guidelines of all State and federal agencies authorized by law to
2426 regulate, use or supervise pesticide applications;
2427
- 2428 4) Aquatic pesticide must not be applied to waters affecting public or food
2429 processing water supplies unless a permit to apply the pesticide has been
2430 obtained from the Agency. All permits must be issued so as not to cause a
2431 violation of the Act or of any of the Board's rules. To aid applicators in
2432 determining their responsibilities under this subsection (h), a list of waters
2433 affecting public water supplies will be published and maintained by the
2434 Agency's Division of Public Water Supplies.
2435

2436 (Source: Amended at 46 Ill. Reg. _____, effective _____)
2437

Section 302.545 Data Requirements

2438 The Agency must review, for validity, applicability and completeness the data used in
2439 calculating criteria or values. To the extent available, and to the extent not otherwise specified,
2440 testing procedures, selection of test species and other aspects of data acquisition must be
2441 according to methods published by USEPA or nationally recognized standards of organizations,
2442 including those methods found in Standard Methods, incorporated by reference in 35 Ill. Adm.
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2445 Code 301.106, or recommended in 40 CFR 132, incorporated by reference in 35 Ill. Adm. Code
2446 301.106.

2447

2448 (Source: Amended at 46 Ill. Reg. _____, effective _____)
2449

2450 Section 302.550 Analytical Testing

2451

2452 All methods of sample collection, preservation, and analysis used in applying any of the
2453 requirements of this Subpart must be consistent with the methods published by USEPA or
2454 nationally recognized standards of organizations, including those methods found in Standard
2455 Methods, incorporated by reference in 35 Ill. Adm. Code 301.106, or recommended in 40 CFR
2456 132 and incorporated by reference in 35 Ill. Adm. Code 301.106.

2457

2458 (Source: Amended at 46 Ill. Reg. _____, effective _____)
2459

2460 Section 302.553 Determining the Lake Michigan Aquatic Toxicity Criteria or Values – 2461 General Procedures

2462

2463 The Lake Michigan Aquatic Life Criteria and Values are those concentrations or levels of a
2464 substance at which aquatic life is protected from adverse effects resulting from short or long term
2465 exposure in water.

2466

2467 a) Tier I criteria and Tier II values to protect against acute effects in aquatic
2468 organisms will be calculated according to procedures listed at 35 Ill. Adm. Code
2469 302.555, 302.560 and 302.563. The procedures of 35 Ill. Adm. Code 302.560
2470 must be used as necessary to allow for interactions with other water quality
2471 characteristics such as hardness, pH, temperature, etc. Tier I criteria and Tier II
2472 values to protect against chronic effects in aquatic organisms must be calculated
2473 according to the procedures listed at 35 Ill. Adm. Code 302.565.

2474

2475 b) Minimum data requirements. In order to derive a Tier I acute or chronic criterion,
2476 data must be available for at least one species of freshwater animal in at least
2477 eight different families such that the following taxa are included:

2478

2479 1) The family Salmonidae in the class Osteichthyes;

2480

2481 2) One other family in the class Osteichthyes;

2482

2483 3) A third family in the phylum Chordata;

2484

2485 4) A planktonic crustacean;

2486

2487 5) A benthic crustacean;

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- 2489 6) An insect;
- 2490
- 2491 7) A family in a phylum other than Arthropoda or Chordata; and
- 2492
- 2493 8) A family from any order of insect or any phylum not already represented.
- 2494
- 2495 c) Data for tests with plants, if available, must be included in the data set.
- 2496
- 2497 d) If data for acute effects are not available for all the eight families listed above, but
- 2498 are available for the family Daphnidae, a Tier II value must be derived according
- 2499 to procedures in 35 Ill. Adm. Code 302.563. If data for chronic effects are not
- 2500 available for all the eight families, but there are acute and chronic data available
- 2501 according to 35 Ill. Adm. Code 302.565(b) so that three acute to chronic ratios
- 2502 (ACRs) can be calculated, then a Tier I chronic criterion can be derived according
- 2503 to procedures in 35 Ill. Adm. Code 302.565. If three ACRs are not available, then
- 2504 a Tier II chronic value can be derived according to procedures in 35 Ill. Adm.
- 2505 Code 302.565(b).
- 2506
- 2507 e) Data must be obtained from species that have reproducing wild populations in
- 2508 North America except that data from salt water species can be used in the
- 2509 derivation of an ACR.
- 2510

2511 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2512

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

2513

2514

2515

2516 If the acute toxicity of the chemical has not been shown to be related to a water quality

2517 characteristic, including hardness, pH, or temperature, the Tier I LMAATC is calculated using

2518 the procedures below.

2519

- 2520 a) For each species for which more than one acute value is available, the Species
- 2521 Mean Acute Value (SMAV) is calculated as the geometric mean of the acute
- 2522 values from all tests.
- 2523
- 2524 b) For each genus for which one or more SMAVs are available, the Genus Mean
- 2525 Acute Value (GMAV) is calculated as the geometric mean of the SMAVs
- 2526 available for the genus.
- 2527
- 2528 c) The GMAVs are ordered from high to low in numerical order.
- 2529
- 2530 d) Ranks (R) are assigned to the GMAVs from "1" for the lowest to "N" for the
- 2531 highest. If two or more GMAVs are identical, successive ranks are arbitrarily
- 2532 assigned.

- 2533
- 2534 e) The cumulative probability, P, is calculated for each GMAV as R/(N+1).
- 2535
- 2536 f) The GMAVs to be used in the calculations of subsection (g) must be those with
- 2537 cumulative probabilities closest to 0.05. If there are fewer than 59 GMAVs in the
- 2538 total data set, the values utilized must be the lowest four obtained through the
- 2539 ranking procedures of subsections (c) and (d).
- 2540
- 2541 g) Using the GMAVs identified under subsection (f) and the Ps calculated under
- 2542 subsection (e), the Final Acute Value (FAV) and the LMAATC are calculated as:

$$\begin{aligned} \text{FAV} &= \exp(A) \text{ and} \\ \text{LMAATC} &= \text{FAV}/2 \end{aligned}$$

2546 Where:

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

- 2549
- 2550 h) If a resident or indigenous species, whose presence is necessary to sustain
- 2551 commercial or recreational activities, will not be protected by the calculated
- 2552 FAV, then the SMAV for that species is used as the FAV.
- 2553

2554 (Source: Amended at 46 Ill. Reg. _____, effective _____)

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

2558 If data are available to show that a relationship exists between a water quality characteristic (WQC) and acute toxicity to two or more species, a Tier I LMAATC must be calculated using procedures in this Section. Although the relationship between hardness and acute toxicity is typically non-linear, it can be linearized by a logarithmic transformation (i.e., for any variable, K, f(K) = logarithm of K) of the variables and plotting the logarithm of hardness against the logarithm of acute toxicity. Similarly, relationships between acute toxicity and other water quality characteristics, such as pH or temperature, may require a transformation, including no transformation (i.e., for any variable, K, f(K) = K) for one or both variables to obtain least squares linear regression of the transformed acute toxicity values on the transformed values of the water quality characteristic. An LMAATC is calculated using the following procedures.

- 2569
- 2570 a) For each species for which acute toxicity values are available at two or more
- 2571 different values of the water quality characteristic, a linear least squares
- 2572 regression of the transformed acute toxicity (TAT) values on the transformed

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2573 water quality characteristic (TWQC) values is performed to obtain the slope of the
2574 line describing the relationship.

2575

2576 b) Each of the slopes determined under subsection (a) is evaluated as to whether it is
2577 statistically valid, considering the range and number of tested values of the water
2578 quality characteristic and the degree of agreement within and between species. If
2579 slopes are not available for at least one fish and one invertebrate species, or if the
2580 available slopes are too dissimilar or if too few data are available to define the
2581 relationship between acute toxicity and the water quality characteristic, then the
2582 LMAATC must be calculated using the procedures in 35 Ill. Adm. Code 302.555.

2583

2584 c) Normalize the TAT values for each species by subtracting W, the arithmetic mean
2585 of the TAT values of a species, from each of the TAT values used in the
2586 determination of the mean, such that the arithmetic mean of the normalized TAT
2587 values for each species individually or for any combination of species is zero
2588 (0.0).

2589

2590 d) Normalize the TWQC values for each species using X, the arithmetic mean of the
2591 TWQC values of a species, in the same manner as in subsection (c).

2592

2593 e) Group all the normalized data by treating them as if they were from a single
2594 species and perform a least squares linear regression of all the normalized TAT
2595 values on the corresponding normalized TWQC values to obtain the pooled acute
2596 slope, V.

2597

2598 f) For each species, the graphical intercept representing the species TAT intercept,
2599 f(Y), at a specific selected value, Z, of the WQC is calculated using the equation:

2600

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

2602

2603

2604

Where:

f() is the transformation used to convert acute toxicity values to TAT values

Y is the species acute toxicity intercept or species acute intercept

W is the arithmetic mean of the TAT values as specified in subsection (c)

V is the pooled acute slope as specified in subsection (e)

X is the arithmetic mean of the TWQC values as specified in subsection (c)

g() is the transformation used to convert the WQC values to TWQC values

Z is a selected value of the WQC

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- g) For each species, determine the species acute intercept, Y, by carrying out an inverse transformation of the species TAT value, f(Y). For example, in the case of a logarithmic transformation, Y = antilogarithm of (f(Y)); or in the case where no transformation is used, Y = f(Y).
- h) The Final Acute Intercept (FAI) is derived by using the species acute intercepts, obtained from subsection (f), in compliance with the procedures described in 35 Ill. Adm. Code 302.555(b) through (g), with the word "value" replaced by the word "intercept". Note that in this procedure geometric means and natural logarithms are always used.
- i) The Aquatic Acute Intercept (AAI) is obtained by dividing the FAI by two. If, for a commercially or recreationally important species, the geometric mean of the acute values at Z is lower than the FAV at Z, then the geometric mean of that species must be used as the FAV.
- j) The LMAATC at any value of the WQC, denoted by WQCx, is calculated using the terms defined in subsection (f) and the equation:

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

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

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

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

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

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

3	16.0
4	14.0
5	12.2
6	10.4
7	8.6

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

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

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

a) Determining Tier I LMCATC

- 1) When chronic toxicity data are available for at least eight resident or indigenous species from eight different North American genera of freshwater organisms as specified in 35 Ill. Adm. Code 302.553, a Tier I LMCATC is derived in the same manner as the FAV in 35 Ill. Adm. Code 302.555 or 302.560 by substituting LMCATC for FAV or FAI, chronic for acute, SMCV (Species Mean Chronic Value) for SMAV, and GMCV (Genus Mean Chronic Value) for GMAV.
- 2) If data are not available to meet the requirements of subsection (a), a Tier I LMCATC is calculated by dividing the FAV by the geometric mean of the acute-chronic ratios (ACRs) obtained from at least one species of aquatic animal from at least three different families provided that of the three species:
 - A) At least one is a fish;
 - B) At least one is an invertebrate; and
 - C) At least one species is an acutely sensitive freshwater species if the other two are saltwater species.
- 3) The acute-chronic ratio (ACR) for a species equals the acute toxicity concentration from data considered under 35 Ill. Adm. Code 302.555 or

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- 2677 302.560, divided by the chronic toxicity concentration.
2678
2679 4) If a resident or indigenous species whose presence is necessary to sustain
2680 commercial or recreational activities will not be protected by the
2681 calculated LMCATC, then the SMCV for that species is used as the
2682 CATC.
2683
2684 b) Determining the Tier II LMCATV
2685
2686 1) If all eight minimum data requirements for calculating a FCV using Tier I
2687 procedures are not met, or if there are not enough data for all three ACRs,
2688 a Tier II Lake Michigan Chronic Aquatic Life Toxicity Value must be
2689 calculated using a secondary acute chronic ratio (SACR) determined as
2690 follows:
2691
2692 A) If fewer than three valid experimentally determined ACRs are
2693 available:
2694
2695 i) Use sufficient ACRs of 18 so that the total number of
2696 ACRs equals three; and
2697
2698 ii) Calculate the Secondary Acute-Chronic Ratio as the
2699 geometric mean of the three ACRs; or
2700
2701 B) If no experimentally determined ACRs are available, the SACR is
2702 18.
2703
2704 2) Calculate the Tier II LMCATV using one of the following equations:
2705
2706 A) Tier II LMCATV = FAV / SACR
2707
2708 B) Tier II LMCATV = SAV / FACR
2709
2710 C) Tier II LMCATV = SAV / SACR
2711
2712 Where:
2713
2714 the SAV equals 2 times the value of the Tier II LMAATV
2715 calculated in 35 Ill. Adm. Code 302.563
2716
2717 3) If, for a commercially or recreationally important species, the SMCV is
2718 lower than the calculated Tier II LMCATV, then the SMCV must be used
2719 as the Tier II LMCATV.
2720

2721 (Source: Amended at 46 Ill. Reg. _____, effective _____)
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2723 **Section 302.570 Procedures for Deriving Bioaccumulation Factors for the Lake Michigan**
2724 **Basin**

2725
2726 A bioaccumulation factor (BAF) is used to relate the concentration of a substance in an aquatic
2727 organism to the concentration of the substance in the waters in which the organism resides when
2728 all routes of exposure (ambient water and food) are included. A BAF is used in the derivation of
2729 water quality criteria to protect wildlife and criteria and values to protect human health.

2730
2731 a) Selection of data. BAFs can be obtained or developed from one of the following
2732 methods, listed in order of preference.

2733
2734 1) Field-measured BAF.

2735
2736 2) Field-measured biota-sediment accumulation factor (BSAF).

2737
2738 3) Laboratory-measured bioconcentration factor (BCF).
2739 The concentration of particulate organic carbon (POC) and dissolved
2740 organic carbon (DOC) in the test solution must be either measured or
2741 reliably estimated.

2742
2743 4) Predicted BCF.

2744
2745 Predicted baseline BCF = K_{ow} .

2746
2747 b) Calculation of baseline BAFs for organic chemicals.
2748 The most preferred BAF or BCF from above is used to calculate a baseline BAF
2749 which in turn is utilized to derive a human health or wildlife specific BAF.

2750
2751 1) Procedures for determining the necessary elements of baseline calculation.

2752
2753 A) Lipid normalization. The lipid-normalized concentration, C_1 , of a
2754 chemical in tissue is defined using the following equation:

2755
2756
$$C_1 = C_b / f_l$$

2757
2758 Where:

2759
 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

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2761 B) Bioavailability.
2762 The fraction of the total chemical in the ambient water that is
2763 freely dissolved, f_{fd} , must be calculated using the following
2764 equation:

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

2765
2766
2767
2768 Where:
2769

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

Kow = octanol-water partition coefficient of the chemical

POC = concentration of particulate organic carbon, kg of
particulate organic carbon/L of water

2770
2771 C) Food Chain Multiplier (FCM). For an organic chemical, the FCM
2772 used must be taken from Table B-1 in Appendix B of 40 CFR 132
2773 incorporated by reference at 35 Ill. Adm. Code 301.106.
2774

2775 2) Calculation of baseline BAFs.

2776
2777 A) From field-measured BAFs:

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

2778
2779
2780
2781 Where:
2782

BAF_{tT} = BAF based on total concentration in tissue and
water of study organism and site

f_l = fraction of the tissue of study organism that is
lipid

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

2783
2784 B) From a field measured biota-sediment accumulation factor
2785 (BSAF):
2786

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

2787
2788
2789
2790 Where:
2791

$(\text{BSAF})_i$ = BSAF for chemical "i"

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

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

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

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

$$BSAF = C_1 / C_{soc}$$

Where:

C_1 = the lipid-normalized concentration of the chemical in tissue

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

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

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

Where:

C_s = concentration of chemical in sediment ($\mu\text{g/g}$ sediment)

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

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- C) From a laboratory-measured BCF:

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

Where:

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

f_l = fraction of the tissue that is lipid

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

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

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interpolation for trophic level 3 or 4, as necessary

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2821
- D) From a predicted BCF:
- $$\text{baseline BAF} = (\text{FCM}) (\text{predicted baseline BCF}) = (\text{FCM})(K_{ow})$$
- Where:
- FCM = the food-chain multiplier obtained from Table B-1 in Appendix B of 40 CFR 132, incorporated by reference at 35 Ill. Adm. Code 301.106 302.510, by linear interpolation for trophic level 3 or 4, as necessary
- K_{ow} = octanol-water partition coefficient
- 2822
2823
2824
- c) Human health and wildlife BAFs for organic chemicals:
- 2825
2826
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2830
- 1) Fraction freely dissolved (f_{fd}). By using the equation in subsection (b)(1)(B), the f_{fd} to be used to calculate human health and wildlife BAFs for an organic chemical must be calculated using a standard POC concentration of 0.0000004 kg/L and a standard DOC concentration of 0.000002 kg/L:
- $$f_{fd} = 1 / [1 + (0.00000024 \text{ kg/L})(K_{ow})]$$
- 2831
2832
- 2) Human health BAF. The human health BAFs for an organic chemical must be calculated using the following equations:
- 2833
2834
2835
- A) For trophic level 3:
- $$\text{Human Health BAF}_{\text{HHTL3}} = [(\text{baseline BAF})(0.0182) + 1] (f_{fd})$$
- 2836
2837
2838
2839
- B) For trophic level 4:
- $$\text{Human Health BAF}_{\text{HHTL4}} = [(\text{baseline BAF}) (0.0310) + 1] (f_{fd})$$
- 2840
2841
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2843
- Where:
- 2844
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2849
- 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
- 2850
- 3) Wildlife BAF. The wildlife BAFs for an organic chemical must be

2851 calculated using the following equations:

2852

2853 A) For trophic level 3:

2854

2855 Wildlife $BAF_{WLT3} = [(baseline\ BAF)(0.0646) + 1] (f_{fd})$

2856

2857 B) For trophic level 4:

2858

2859 Wildlife $BAF_{WLT4} = [(baseline\ BAF)(0.1031) + 1] (f_{fd})$

2860

2861 Where:

2862

2863 0.0646 and 0.1031 are the standardized fraction lipid values
2864 for trophic levels 3 and 4, respectively, that are used to
2865 derive wildlife criteria

2866

2867 d) Human health and wildlife BAFs for inorganic chemicals. For inorganic
2868 chemicals the baseline BAFs for trophic levels 3 and 4 are both assumed to equal
2869 the BCF determined for the chemical with fish.

2870

2871 1) Human health. Measured BAFs and BCFs used to determine human
2872 health BAFs for inorganic chemicals must be based on concentration in
2873 edible tissue (e.g., muscle) of freshwater fish.

2874

2875 2) Wildlife. Measured BAFs and BCFs used to determine wildlife BAFs for
2876 inorganic chemicals must be based on concentration in the whole body of
2877 freshwater fish and invertebrates.

2878

2879 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2880

2881 **Section 302.575 Procedures for Deriving Tier I Water Quality Criteria and Values in the**
2882 **Lake Michigan Basin to Protect Wildlife**

2883

2884 The Lake Michigan Basin Wildlife Criterion (LMWC) is the concentration of a substance which
2885 if not exceeded protects Illinois wild mammal and bird populations from adverse effects
2886 resulting from ingestion of surface waters of the Lake Michigan Basin and from ingestion of
2887 aquatic prey organisms taken from surface waters of the Lake Michigan Basin. Wildlife criteria
2888 calculated under this Section protect against long-term effects and are therefore considered
2889 chronic criteria. The methodology involves utilization of data from test animals to derive criteria
2890 to protect representative or target species: bald eagle, herring gull, belted kingfisher, mink and
2891 river otter. The lower of the geometric mean of species specific criteria for bird species or
2892 mammal species is chosen as the LMWC to protect a broad range of species.

2893

2894 a) This method must also be used for non-BCCs when appropriately modified to

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- 2895 consider the following factors:
2896
2897 1) Selection of scientifically justified target species;
2898
2899 2) Relevant routes of chemical exposure;
2900
2901 3) Pertinent toxicity endpoints.
2902
- 2903 b) Minimum data requirements:
2904
2905 1) Test dose (TD). In order to calculate a LMWC the following minimal data
2906 base is required:
2907
2908 A) There must be at least one data set showing dose-response for oral,
2909 subchronic, or chronic exposure of 28 days for one bird species;
2910 and
2911
2912 B) There must be at least one data set showing dose-response for oral,
2913 subchronic, or chronic exposure of 90 days for one mammal
2914 species.
2915
- 2916 2) Bioaccumulation Factor (BAF) data requirements:
2917
2918 A) For any chemical with a BAF of less than 125 the BAF may be
2919 obtained by any method; and
2920
2921 B) For chemicals with a BAF of greater than 125 the BAF must come
2922 from a field measured BAF or Biota-Sediment Accumulation
2923 Factor (BSAF).
2924
- 2925 c) Principles for development of criteria
2926
2927 1) Dose standardization. The data for the test species must be expressed as,
2928 or converted to, the form mg/kg/d utilizing the guidelines for drinking and
2929 feeding rates and other procedures in 40 CFR 132, incorporated by
2930 reference in 35 Ill. Adm. Code 301.106.
2931
- 2932 2) Uncertainty factors (UF) for utilizing test dose data in the calculation of
2933 the target species value (TSV);
2934
2935 A) Correction for intermittent exposure. If the animals used in a study
2936 were not exposed to the toxicant each day of the test period, the no
2937 observed adverse effect level (NOAEL) must be multiplied by the
2938 ratio of days of exposure to the total days in the test period.

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- 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 must not be less than one and should not exceed 10.
- C) Correction for subchronic to chronic extrapolation (UF_s). In instances where only subchronic data are available, the TD may be derived from subchronic data. The value of the UF_s must not be less than one and should not exceed 10.
- D) Correction for interspecies extrapolations (UF_a). For the derivation of criteria, a UF_a must not be less than one and should not exceed 100. The UF_a must be used only for extrapolating toxicity data across species within a taxonomic class. A species specific UF_a must be selected and applied to each target species, consistent with the equation in subsection (d).

- 2957
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2961
- d) Calculation of TSV. The TSV, measured in milligrams per liter (mg/L), is calculated according to the equation:

$$TSV = \{[TD \times Wt] / [UF_a \times UF_s \times UF_1]\} / \{W + \sum[F_{TLi} \times BAF_{WLTLi}]\}$$

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_a = the uncertainty factor for extrapolating toxicity data across species (unitless). A species-specific UF_a must be selected and applied to each target species, consistent with the equation.
- UF_s = the uncertainty factor for extrapolating from subchronic to chronic exposures (unitless).
- UF_1 = the uncertainty factor for extrapolation from LOAEL to NOAEL (unitless).
- Wt = average weight in kilograms (kg) of the target species.
- W = average daily volume of water in liters consumed per day (L/d) by the target species.
- F_{TLi} = average daily amount of food consumed by the target species in kilograms (kg/d) for trophic level i.
- BAF_{WLTLi} = aquatic life bioaccumulation factor with units of liter per kilogram (L/kg), as derived from 35 Ill. Adm. Code 302.570

for trophic level i.

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

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

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

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

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

- 1) Tier I.

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

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

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

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

Section 302.585 Procedures for Determining the Lake Michigan Basin Human Health

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3005 Threshold Criterion (LMHHTC) and the Lake Michigan Basin Human Health Threshold 3006 Value (LMHHTV) 3007

3008 The LMHHTC or LMHHTV is derived for all toxic substances from the most sensitive end point
3009 for which there exists a dosage or concentration below which no adverse effect or response is
3010 likely to occur.

3011

3012 a) Minimum data requirements:

3013

3014 1) Tier I. The minimum data set sufficient to derive a Tier I LMHHTC must
3015 include at least one epidemiological study or one animal study of greater
3016 than 90 days duration; or

3017

3018 2) Tier II. When the minimum data for deriving Tier I criteria are not
3019 available, a more limited database consisting of an animal study of greater
3020 than 28 days duration must be used.

3021

3022 b) Principles for development of Tier I criteria and Tier II values:

3023

3024 1) The experimental exposure level representing the highest level tested at
3025 which no adverse effects were demonstrated (NOAEL) must be used for
3026 calculation of a criterion or value. In the absence of a NOAEL, a LOAEL
3027 must be used if it is based on relatively mild and reversible effects;

3028

3029 2) Uncertainty factors (UFs) must be used to account for the uncertainties in
3030 predicting acceptable dose levels for the general human population based
3031 upon experimental animal data or limited human data:

3032

3033 A) A UF of 10 must be used when extrapolating from experimental
3034 results of studies on prolonged exposure to average healthy
3035 humans;

3036

3037 B) A UF of 100 must be used when extrapolating from results of long-
3038 term studies on experimental animals;

3039

3040 C) A UF of up to 1000 must be used when extrapolating from animal
3041 studies for which the exposure duration is less than chronic, but
3042 greater than subchronic;

3043

3044 D) A UF of up to 3000 must be used when extrapolating from animal
3045 studies for which the exposure duration is less than subchronic;

3046

3047 E) An additional UF of between one and ten must be used when
3048 deriving a criterion from a LOAEL. The level of additional

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- 3049 uncertainty applied will depend upon the severity and the
3050 incidence of the observed adverse effect;
3051
3052 F) An additional UF of between one and ten must be applied when
3053 there are limited effects data or incomplete sub-acute or chronic
3054 toxicity data;
3055
3056 3) The total uncertainty (\sum of the uncertainty factors) must not exceed 10,000
3057 for Tier I criterion and 30,000 for Tier II value; and
3058
3059 4) All study results must be converted to the standard unit for acceptable
3060 daily exposure of milligrams of toxicant per kilogram of body weight per
3061 day (mg/kg/day). Doses must be adjusted for continuous exposure.
3062

3063 c) Tier I criteria and Tier II value derivation.

- 3064
3065 1) Determining the Acceptable Daily Exposure (ADE)
3066

3067 $ADE = \text{test value} / \sum \text{ of the UFs from subsection (b)(2)}$
3068

3069 Where:

3070 acceptable daily exposure is in milligrams toxicant per kilogram
3071 body weight per day (mg/kg/day)
3072
3073

- 3074 2) Determining the Lake Michigan Basin Human Health Threshold Criterion
3075 (LMHHTC) or the Lake Michigan Basin Human Health Threshold Value
3076 (LMHHTV)
3077

3078 LMHHTC or LMHHTV =

3079 $\{ADE \times BW \times RSC\} /$

3080 $\{WC + [(FC_{TL3} \times BAF_{HHTL3}) + (FC_{TL4} \times BAF_{HHTL4})]\}$
3081

3082
3083
3084 Where:

3085 LMHHTC or LMHHTV is in milligrams per liter (mg/L)

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

RSC = relative source contribution factor of 0.8

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

- WC = per capita water consumption (both drinking and incidental exposure) for surface waters classified as public water supplies = two liters/day; or per capita incidental daily water ingestion for surface waters not used as human drinking water sources = 0.01 liters/day
- FC_{TL3} = mean consumption of trophic level 3 fish by regional sport fishers of regionally caught freshwater fish = 0.0036 kg/day
- FC_{TL4} = mean consumption of trophic level 4 fish by regional sport fishers of regionally caught freshwater fish = 0.0114 kg/day
- BAF_{HHTL3} = human health bioaccumulation factor for edible portion of trophic level 3 fish, as derived using the BAF methodology in 35 Ill. Adm. Code 302.570
- BAF_{HHTL4} = human health bioaccumulation factor for edible portion of trophic level 4 fish, as derived using the BAF methodology in 35 Ill. Adm. Code 302.570

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

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

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

- a) Minimum data requirements. Minimal experimental or epidemiological data requirements are incorporated in the cancer classification determined by USEPA at Appendix C II A to 40 CFR 132, incorporated by reference at 35 Ill. Adm. Code 301.106.
- b) Principles for development of criteria or values:
 - 1) Animal data are fitted to a linearized multistage computer model (Global 1986 in "Mutagenicity and Carcinogenicity Assessment for 1, 3-Butadiene" September 1985 EPA/600/8-85/004A, incorporated by reference at 35 Ill. Adm. Code 301.106 or scientifically justified equivalents). The upper-bound 95 percent confidence limit on risk at the 1 in 100,000 risk level must be used to calculate a risk associated dose

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3111 (RAD); and
3112
3113 2) A species scaling factor must be used to account for differences between
3114 test species and humans. Milligrams per surface area per day is an
3115 equivalent dose between species. All doses presented in mg/kg
3116 bodyweight will be converted to an equivalent surface area dose by raising
3117 the mg/kg dose to the 3/4 power.
3118

3119 c) Determining the risk associated dose (RAD). The RAD must be calculated using
3120 the following equation:
3121

$$\text{RAD} = 0.00001 / q_1^*$$

3122
3123 Where:
3124
3125

RAD = risk associated dose in milligrams of toxicant or combinations of toxicants per kilogram body weight per day (mg/kg/day)

0.00001 (1 X 10⁻⁵) = incremental risk of developing cancer equal to 1 in 100,000

q₁^{*} = slope factor (mg/kg/day)⁻¹

RAD = risk associated dose in milligrams of toxicant or combinations of toxicants per kilogram body weight per day (mg/kg/day)

0.00001 (1 X 10⁻⁵) = incremental risk of developing cancer equal to 1 in 100,000

q₁^{*} = slope factor (mg/kg/day)⁻¹

3126
3127 d) Determining the Lake Michigan Basin Human Health Nonthreshold Criterion
3128 (LMHHNC) or the Lake Michigan Basin Human Health Nonthreshold Value
3129 (LMHHNV):
3130

3131 LMHHNC or LMHHNV =

$$\{ \text{RAD} \times \text{BW} \} / \{ \text{WC} + [(\text{FC}_{\text{TL3}} \times \text{BAF}_{\text{HHTL3}}) + (\text{FC}_{\text{TL4}} \times \text{BAF}_{\text{HHTL4}})] \}$$

3132
3133
3134 Where:
3135
3136

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

- RAD = risk associated dose of a substance or combination of substances in milligrams per day (mg/d) which is associated with a lifetime cancer risk level equal to a ratio of 1 to 100,000
- BW = weight of an average human (BW = 70 kg)
- WC = per capita water consumption for surface waters classified as public water supplies = two liters/day, or per capita incidental daily water ingestion for surface waters not used as human drinking water sources = 0.01 liters/day
- FC_{TL3} = mean consumption of trophic level 3 of regionally caught freshwater fish = 0.0036 kg/day
- FC_{TL4} = mean consumption of trophic level 4 of regionally caught freshwater fish = 0.0114 kg/day
- BAF_{HHTL3}, BAF_{HHTL4} = bioaccumulation factor for trophic levels 3 and 4 as derived in 35 Ill. Adm. Code 302.570

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

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

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

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3148

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

3149

3150

3151

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

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

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3157

SUBPART F: PROCEDURES FOR DETERMINING WATER QUALITY CRITERIA

3158

3159

Section 302.601 Scope and Applicability

3160

3161

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

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3163 Code 302.210(a), (b) and (c) and 302.410(a), (b) and (c).

3164

3165 (Source: Amended at 46 Ill. Reg. _____, effective _____)

3166

3167 **Section 302.603 Definitions**

3168

3169 As used in this Subpart, the following terms have the meanings specified.

3170

3171 "Bioconcentration" means an increase in concentration of a chemical and its
3172 metabolites in an organism (or its specified tissues) relative to the concentration
3173 of the chemical in the ambient water acquired through contact with the water
3174 alone.

3175

3176 "Carcinogen" means a chemical which causes an increased incidence of benign or
3177 malignant neoplasms, or a statistically significant decrease in the latency period
3178 between exposure and onset of neoplasms in at least one mammalian species or
3179 man through epidemiological or clinical studies.

3180

3181 "EC-50" means the concentration of a substance or effluent which causes a given
3182 effect to 50% of the exposed organisms in a given time period.

3183

3184 "LC-50" means the concentration of a toxic substance or effluent which is lethal
3185 to 50% of the exposed organisms in a given time period.

3186

3187 "LOAEL" or "Lowest Observable Adverse Effect Level" means the lowest tested
3188 concentration of a chemical or substance which produces a statistically significant
3189 increase in frequency or severity of non-overt adverse effects between the
3190 exposed population and its appropriate control.

3191

3192 "MATC" or "Maximum Acceptable Toxicant Concentration" means the value
3193 obtained by calculating the geometric mean of the lower and upper chronic limits
3194 from a chronic test. A lower chronic limit is the highest tested concentration
3195 which did not cause the occurrence of a specified adverse effect. An upper
3196 chronic limit is the lowest tested concentration which did cause the occurrence of
3197 a specified adverse effect and above which all tested concentrations caused such
3198 an occurrence.

3199

3200 "NOAEL" or "No Observable Adverse Effect Level" means the highest tested
3201 concentration of a chemical or substance which does not produce a statistically
3202 significant increase in frequency or severity of non-overt adverse effects between
3203 the exposed population and its appropriate control.

3204

3205 "Resident or Indigenous Species" means species which currently live a substantial
3206 portion of their lifecycle or reproduce in a given body of water, or which are

3207 native species whose historical range includes a given body of water.

3208

3209 (Source: Amended at 46 Ill. Reg. _____, effective _____)

3210

3211 **Section 302.604 Mathematical Abbreviations**

3212

3213 This Subpart uses the following mathematical abbreviations:

3214

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

3215

3216 (Source: Amended at 46 Ill. Reg. _____, effective _____)

3217

3218 **Section 302.606 Data Requirements**

3219

3220 The Agency must review, for validity, applicability and completeness, data used in calculating
3221 criteria. To the extent available, and to the extent not otherwise specified, testing procedures,
3222 selection of test species and other aspects of data acquisition must be according to methods
3223 published by USEPA or nationally recognized standards organizations, including methods found
3224 in "Standard Methods", incorporated by reference in 35 Ill. Adm. Code 301.106.

3225

3226 (Source: Amended at 46 Ill. Reg. _____, effective _____)

3227

3228 **Section 302.612 Determining the Acute Aquatic Toxicity Criterion for an Individual**
3229 **Substance - General Procedures**

3230

3231 a) A chemical specific Acute Aquatic Toxicity Criterion (AATC) is calculated using
3232 procedures specified in 35 Ill. Adm. Code 302.615 and 302.618 if acute toxicity
3233 data are available for at least five resident or indigenous species from five
3234 different North American genera of freshwater organisms including
3235 representatives of the following taxa:

3236

3237 1) Representatives of two families in the Class Osteichthyes (Bony Fishes).

3238

3239 2) The family Daphnidae.

3240

3241 3) A benthic aquatic macroinvertebrate.

3242

3243 4) A vascular aquatic plant or a third family in the Phylum Chordata which
3244 may be from the Class Osteichthyes.

3245

3246 b) If data are not available for resident or indigenous species, data for non-resident
3247 species may be used if the non-resident species is of the same family or genus and
3248 has a similar habitat and environmental tolerance. The procedures of 35 Ill. Adm.
3249 Code 302.615 must be used to obtain an AATC for individual substances whose
3250 toxicity is unaffected by ambient water quality characteristics. The procedures of
3251 35 Ill. Adm. Code 302.618 must be used if the toxicity of a substance is
3252 dependent upon some other water quality characteristic.
3253

3254 c) If data are not available that meet the requirements of subsection (a), an AATC is
3255 calculated by obtaining at least one EC-50 or LC-50 value from both a daphnid
3256 species and either fathead minnow or bluegill. If there are data available for any
3257 other North American freshwater species, they must also be included. An AATC
3258 is calculated by dividing the lowest Species Mean Acute Value (SMAV), as
3259 determined according to 35 Ill. Adm. Code 302.615, by 10.
3260

3261 (Source: Amended at 46 Ill. Reg. _____, effective _____)
3262

3263 **Section 302.615 Determining the Acute Aquatic Toxicity Criterion – Toxicity Independent**
3264 **of Water Chemistry**
3265

3266 If the acute toxicity of the chemical has not been shown to be related to a water quality
3267 characteristic, including hardness, pH, temperature, etc., the AATC is calculated by using the
3268 procedures below.
3269

3270 a) For each species for which more than one acute value is available, the Species
3271 Mean Acute Value (SMAV) is calculated as the geometric mean of the acute
3272 values from all tests.
3273

3274 b) For each genus for which one or more SMAVs are available, the Genus Mean
3275 Acute Value (GMAV) is calculated as the geometric mean of the SMAVs
3276 available for the genus.
3277

3278 c) The GMAVs are ordered from high to low.
3279

3280 d) Ranks (R) are assigned to the GMAVs from "1" for the lowest to "N" for the
3281 highest. If two or more GMAVs are identical, successive ranks are arbitrarily
3282 assigned.
3283

3284 e) The cumulative probability, P, is calculated for each GMAV as $R/(N + 1)$.
3285

3286 f) The GMAVs to be used in the calculations of subsection (g) must be those with
3287 cumulative probabilities closest to 0.05. If there are less than 59 GMAVs in the
3288 total data set, the values utilized must be the lowest obtained through the ranking
3289 procedures of subsections (c) and (d). "T" is the number of GMAV's which are to

3290 be used in the calculations of subsection (g). T is equal to 4 when the data set
 3291 includes at least one representative from each of the five taxa in 35 Ill. Adm.
 3292 Code 302.612 and a representative from each of the three taxa listed below. T is
 3293 equal to 3 when the data includes at least one representative from each of the five
 3294 taxa in 35 Ill. Adm. Code 302.612 and from one or two of the taxa listed below.
 3295 T is equal to 2 when the data set meets the minimum requirements of 35 Ill. Adm.
 3296 Code 302.612 but does not include representatives from any of the three taxa
 3297 listed below. When toxicity data on any of the three taxa listed below are
 3298 available, they must be used along with the minimum data required pursuant to 35
 3299 Ill. Adm. Code 302.612.

- 3300
- 3301 1) A benthic crustacean, unless one was used under 35 Ill. Adm. Code
 3302 302.612(a)(3), in which case an insect must be used.
- 3303
- 3304 2) A member of a phylum not used in subsections (a), (b) or (f)(1).
- 3305
- 3306 3) An insect from an order not already represented.
- 3307

3308 g) Using the GMAVs and T-value identified under subsection (f) and the Ps
 3309 calculated under subsection (e), the Final Acute Value (FAV) and the AATC are
 3310 calculated as:

3311

$$\begin{aligned} \text{FAV} &= \exp(A) \text{ and} \\ \text{AATC} &= \text{FAV}/2 \end{aligned}$$

3312

3313 Where:

3314

$$\begin{aligned} A &= L + 0.2236 S; \\ L &= [\text{SUM}(\ln \text{GMAV}) - S(\text{SUM}(P^{**0.5}))]/T; \text{ and} \\ S &= [[\text{SUM}((\ln \text{GMAV})^{**2}) - ((\text{SUM}(\ln \text{GMAV}))^{**2})/T]/[\text{SUM}(P) - ((\text{SUM}(P^{**0.5}))^{**2})/T]]^{**0.5} \end{aligned}$$

3315

3316 h) If a resident or indigenous species, whose presence is necessary to sustain
 3317 commercial or recreational activities, or prevent disruptions of the waterbody's
 3318 ecosystem, including loss of species diversity or a shift to a biotic community
 3319 dominated by pollution-tolerant species, will not be protected by the calculated
 3320 FAV, then the EC-50 or LC-50 for that species is used as the FAV.

3321 (Source: Amended at 46 Ill. Reg. _____, effective _____)

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3323

3324 **Section 302.618 Determining the Acute Aquatic Toxicity Criterion - Toxicity Dependent on**
 3325 **Water Chemistry**

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3327 If data are available to show that a relationship exists between a water quality characteristic
3328 (WQC) and acute toxicity to two or more species, an Acute Aquatic Toxicity Criterion (AATC)
3329 may be calculated. The best documented relationship is that between the water quality
3330 characteristic, hardness and acute toxicity of metals. Although this relationship between hardness
3331 and acute toxicity is typically non-linear, it can be linearized by a logarithmic transformation (i.e.
3332 for any variable, K , $f(K) = \text{logarithm of } K$) of the variables and plotting the logarithm of
3333 hardness against the logarithm of acute toxicity. Similarly, relationships between acute toxicity
3334 and other water quality characteristics, such as pH or temperature, may require a transformation,
3335 including no transformation (i.e. for any variable, K , $f(K) = K$) for one or both variables to obtain
3336 least squares linear regression of the transformed acute toxicity values on the transformed values
3337 of the water quality characteristic. An AATC is calculated using the following procedures:
3338

- 3339 a) For each species for which acute toxicity values are available at two or more
3340 different values of the water quality characteristic, a linear least squares
3341 regression of the transformed acute toxicity (TAT) values on the transformed
3342 water quality characteristic (TWQC) values is performed to obtain the slope of the
3343 line describing the relationship.
3344
- 3345 b) Each of the slopes determined pursuant to subsection (a) is evaluated as to
3346 whether or not it is statistically valid, taking into account the range and number of
3347 tested values of the water quality characteristic and the degree of agreement
3348 within and between species. If slopes are not available for at least one fish and
3349 one invertebrate species, or if the available slopes are too dissimilar, or if too few
3350 data are available to define the relationship between acute toxicity and the water
3351 quality characteristic, then the AATC must be calculated using the procedures in
3352 35 Ill. Adm. Code 302.615.
3353
- 3354 c) Normalize the TAT values for each species by subtracting W , the arithmetic mean
3355 of the TAT values of a species from each of the TAT values used in the
3356 determination of the mean, such that the arithmetic mean of the normalized TAT
3357 values for each species individually or for any combination of species is zero
3358 (0.0).
3359
- 3360 d) Normalize the TWQC values for each species using X , the arithmetic mean of the
3361 TWQC values of a species, in the same manner as in subsection (c).
3362
- 3363 e) Group all the normalized data by treating them as if they were from a single
3364 species and perform at least squares linear regression of all the normalized TAT
3365 values on the corresponding normalized TWQC values to obtain the pooled acute
3366 slope, V .
3367
- 3368 f) For each species, the graphical intercept representing the species TAT intercept,
3369 $f(Y)$, at a specific selected value, Z , of the WQC is calculated using the equation:
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3371 $f(Y) = W - V(X - g(Z))$

3372

3373 Where:

3374

3375 $f()$ is the transformation used to convert acute toxicity values to TAT
3376 values;

3377

3378 Y is the species acute toxicity intercept or species acute intercept;

3379

3380 W is the arithmetic mean of the TAT values as specified in subsection (c);

3381

3382

3383 V is the pooled acute slope as specified in subsection (e);

3384

3385 X is the arithmetic mean of the TWQC values as specified in subsection
3386 (d);

3387

3388 $g()$ is the transformation used to convert the WQC values to TWQC
3389 values; and

3390

3391 Z is a selected value of the WQC.

3392

3393 g) For each species, determine the species acute intercept, Y , by carrying out an
3394 inverse transformation of the species TAT value, $f(Y)$. For example, in the case
3395 of a logarithmic transformation, $Y = \text{antilogarithm of } (f(Y))$; or in the case where
3396 no transformation is used, $Y = f(Y)$.

3397

3398 h) The Final Acute Intercept (FAI) is derived by using the species acute intercepts,
3399 obtained from subsection (g), in compliance with the procedures described in 35
3400 Ill. Adm. Code 302.615(b) through (g), with the word "value" replaced by the
3401 word "intercept". Note that in this procedure geometric means and natural
3402 logarithms are always used.

3403

3404 i) The Aquatic Acute Intercept (AAI) is obtained by dividing the FAI by two.

3405

3406 j) The AATC at any value of the WQC, denoted by WQC_x , is calculated using the
3407 terms defined in subsection (f) and the equation:

3408

3409
$$AATC = \exp[V (g(WQC_x) - g(Z)) + f(AAI)].$$

3410

3411 (Source: Amended at 46 Ill. Reg. _____, effective _____)

3412

3413 **Section 302.621 Determining the Acute Aquatic Toxicity Criterion - Procedure for**
3414 **Combinations of Substances**

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3415
3416 An AATC for any combination of substances (including effluent mixtures) must be determined
3417 by the following toxicity testing procedures:
3418

3419 a) Not more than 50% of test organisms from the most sensitive species tested may
3420 exhibit mortality or immobility after a 48-hour test for invertebrate or a 96-hour
3421 test for fishes.
3422

3423 b) Three resident or indigenous species of ecologically diverse taxa must be tested
3424 initially. If resident or indigenous species are not available for testing, non-
3425 resident species may be used if the non-resident species is of the same family or
3426 genus and has a similar habitat and environmental tolerance.
3427

3428 (Source: Amended at 46 Ill. Reg. _____, effective _____)
3429

3430 **Section 302.627 Determining the Chronic Aquatic Toxicity Criterion for an Individual** 3431 **Substance - General Procedures** 3432

3433 a) A chemical-specific Chronic Aquatic Toxicity Criterion (CATC) is calculated
3434 using procedures specified in subsection (b) when chronic toxicity data are
3435 available for at least five species from five different North American genera of
3436 freshwater organisms, including representatives from the following taxa:
3437

3438 1) Representatives of two families in the Class Osteichthyes (Bony Fishes).
3439

3440 2) The family Daphnidae.
3441

3442 3) A benthic aquatic macroinvertebrate.
3443

3444 4) An alga (96-hour test) or a vascular aquatic plant.
3445

3446 b) A CATC is derived in the same manner as the FAV in 35 Ill. Adm. Code 302.615
3447 or 302.618 by substituting CATC for FAV or FAI, chronic for acute, MATC for
3448 LC-50, SMCV (Species Mean Chronic Value) for SMAV, and GMCV (Genus
3449 Mean Chronic Value) for GMAV.
3450

3451 c) If data are not available to meet the requirements of subsection (a), a CATC is
3452 calculated by dividing the FAV by the highest acute-chronic ratio obtained from
3453 at least one fish and one invertebrate species. The acute-chronic ratio for a
3454 species equals the acute toxicity concentration from data considered under 35 Ill.
3455 Adm. Code 302.612 through 302.618, divided by the chronic toxicity
3456 concentration from data calculated under subsections (a) and (b) subject to the
3457 following conditions:
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- 1) If the toxicity of a substance is related to any water quality characteristic (WQC), the acute-chronic ratio must be based on acute and chronic toxicity data obtained from organisms exposed to test water with WQC values that are representative of the WQC values of the waterbody under consideration. Preference under this subsection must be given to data from acute and chronic tests done by the same author or in the same reference in order to increase the likelihood of comparable test conditions.
 - 2) If the toxicity of a substance is unrelated to water quality parameters, the acute-chronic ratio may be derived from any acute and chronic test on a species regardless of the similarity in values of those water quality parameters. Preference under this subsection must be given to data from acute and chronic tests done on the same organisms or their descendants.
 - 3) If there is more than one acute-chronic ratio for a species, a geometric mean of the ratio is calculated, corrected for the relationship of toxicity to water quality parameters.
 - 4) If the acute and chronic toxicity data indicate that the acute-chronic ratio varies with changes in water quality parameters, the acute-chronic ratio used over specified values of the water quality parameters must be based on the ratios at water quality parameter values closest to those specified.
 - 5) If acute and chronic toxicity data are unavailable to determine an acute-chronic ratio for at least two North American freshwater species, a ratio of 25 must be used.
- d) If a resident or indigenous species whose presence is necessary to sustain commercial or recreational activities, or prevent disruptions of the waterbody's ecosystem, including but not limited to loss of species diversity or a shift to a biotic community dominated by pollution-tolerant species, will not be protected by the calculated CATC, then the MATC for that species is used as the CATC.

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

Section 302.630 Determining the Chronic Aquatic Toxicity Criterion - Procedure for Combinations of Substances

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A CATC for any combination of substances (including effluent mixtures) may be determined by toxicity testing procedures pursuant to the following:

- 3500
3501
3502
- a) A combination of substances must not exceed concentrations greater than a NOAEL as determined for the most sensitive of the species tested.

3503 b) Three resident or indigenous species of ecologically diverse taxa must be tested
3504 initially. If resident or indigenous species are not available for testing, non-
3505 resident species may be used if the non-resident species is of the same family or
3506 genus and has a similar habitat and environmental tolerance.
3507

3508 (Source: Amended at 46 Ill. Reg. _____, effective _____)
3509

3510 **Section 302.633 The Wild and Domestic Animal Protection Criterion**
3511

3512 The Wild and Domestic Animal Protection Criterion (WDAPC) is the concentration of a
3513 substance which if not exceeded protects Illinois wild and domestic animals from adverse
3514 effects, such as functional impairment or pathological lesions, resulting from ingestion of surface
3515 waters of the State and from ingestion of aquatic organisms taken from surface waters of the
3516 State.
3517

3518 a) For those substances for which a NOAEL has been derived from studies of
3519 mammalian or avian species exposed to the substance via oral routes including
3520 gavage, the lowest NOAEL among species must be used in calculating the
3521 WDAPC. Additional considerations in selecting NOAEL include:
3522

3523 1) If the NOAEL is given in milligrams of toxicant per liter of water
3524 consumed (mg/L), prior to calculating the WDAPC, the NOAEL must be
3525 multiplied by the daily average volume of water consumed by the test
3526 animals in liters per day (L/d) and divided by the average weight of the
3527 test animals in kilograms (kg).
3528

3529 2) If the NOAEL is given in milligrams of toxicant per kilogram of food
3530 consumed (mg/kg), prior to calculating the WDAPC, the NOAEL must be
3531 multiplied by the average amount of food in kilograms consumed daily by
3532 the test animals (kg/d) and divided by the average weight of the test
3533 animals in kilograms (kg).
3534

3535 3) If the animals used in a study were not exposed to the toxicant each day of
3536 the test period, the NOAEL must be multiplied by the ratio of days of
3537 exposure to the total days in the test period.
3538

3539 4) If more than one NOAEL is available for the same animal species, the
3540 geometric mean of the NOAELs must be used to calculate the WDAPC.
3541

3542 b) For those substances for which a NOAEL is not available but the lowest observed
3543 adverse effect level (LOAEL) has been derived from studies of animal species
3544 exposed to the substance via oral routes including gavage, one-tenth of the
3545 LOAEL must be substituted for the NOAEL.
3546

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- 3547 c) The LOAEL must be selected in the same manner as that specified for the
3548 NOAEL in subsection (a).
3549
3550 d) The WDAPC, measured in milligrams per liter (mg/L), is calculated according to
3551 the equation:
3552

$$\text{WDAPC} = [0.1 \text{ NOAEL} \times \text{Wt}] / [\text{W} + (\text{F} \times \text{BCF})]$$

3553 Where:
3554
3555
3556

NOAEL is derived from mammalian or avian studies as specified in subsections (a) and (b), and is measured in units of milligrams of substance per kilogram of body weight per day (mg/kg-d);

Wt = Average weight in kilograms (kg) of the test animals;

W = Average daily volume of water in liters consumed per day (l/d) by the test animals;

F = Average daily amount of food consumed by the test animals in kilograms (kg/d);

BCF = Aquatic life Bioconcentration Factor with units of liter per kilogram (L/kg), as derived in 35 Ill. Adm. Code 302.660 through 302.666; and

The 0.1 represents an uncertainty factor to account for species variability.

- 3557
3558 e) If no studies pertaining to the toxic substance in question can be found by the
3559 Agency, no criterion can be determined.
3560

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

Section 302.645 Determining the Acceptable Daily Intake

3561
3562
3563 The Acceptable Daily Intake (ADI) is the maximum amount of a substance which, if ingested
3564 daily for a lifetime, results in no adverse effects to humans. Subsections (a) through (e) list, in
3565 the order of preference, methods for determining the acceptable daily intake.
3566
3567

- 3568
3569 a) The lowest of the following ADI values:
3570
3571 1) For substances listed with a maximum contaminant level in 40 CFR 141,
3572 incorporated by reference in 35 Ill. Adm. Code 301.106, or in 35 Ill. Adm.
3573 Code 611, the ADI equals the product of multiplying the maximum
3574 contaminant level given in milligrams per liter (mg/L) by 2 liters per day
3575 (L/d).
3576
3577 2) For substances which are listed with a maximum allowable concentration

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- 3578 standard in 35 Ill. Adm. Code Subtitle F, the acceptable daily intake
3579 equals the product of multiplying the public health enforcement standard
3580 given in milligrams per liter (mg/L) by 2 liters per day (L/d).
3581
- 3582 b) For substances for which a no observed adverse effect level (NOAEL-H) for
3583 humans exposed to the substance in drinking water has been derived, the
3584 acceptable daily intake equals the product of multiplying one-tenth of the
3585 NOAEL-H given in milligrams of toxicant per liter of water consumed (mg/L), by
3586 2 liters per day (L/d). The lowest NOAEL-H must be used in the calculation of
3587 the acceptable daily intake.
3588
- 3589 c) For substances for which the lowest observed adverse effect level (LOAEL-H) for
3590 humans exposed to the substance in drinking water has been derived, one-
3591 hundredth of the LOAEL-H may be substituted for the NOAEL-H in subsection
3592 (b).
3593
- 3594 d) For substances for which a no observed adverse effect level (NOAEL-A) has been
3595 derived from studies of mammalian test species exposed to the substance via oral
3596 routes including gavage, the acceptable daily intake equals the product of
3597 multiplying 1/100 of the NOAEL-A given in milligrams toxicant per day per
3598 kilogram of test species weight (mg/kg-d) by the average weight of an adult
3599 human of 70 kilograms (kg). The lowest NOAEL-A among animal species must
3600 be used in the calculation of the acceptable daily intake. Additional
3601 considerations in selecting the NOAEL-A include:
3602
- 3603 1) If the NOAEL-A is given in milligrams of toxicant per liter of water
3604 consumed (mg/L) then, prior to calculating the acceptable daily intake, the
3605 NOAEL-A must be multiplied by the daily average volume of water
3606 consumed by the mammalian test species in liters per day (L/d) and
3607 divided by the average weight of the mammalian test species in kilograms
3608 (kg).
3609
- 3610 2) If the NOAEL-A is given in milligrams of toxicant per kilogram of food
3611 consumed (mg/kg), prior to calculating the acceptable daily intake the
3612 NOAEL-A must be multiplied by the average amount in kilograms of food
3613 consumed daily by the mammalian test species (kg/d) and divided by the
3614 average weight of the mammalian test species in kilograms (kg).
3615
- 3616 3) If the mammalian test species were not exposed to the toxicant each day of
3617 the test period, the NOAEL-A must be multiplied by the ratio of days of
3618 exposure to the total days of the test period.
3619
- 3620 4) If more than one NOAEL-A is available for the same mammalian test
3621 species, the geometric mean of the NOAEL-As must be used.

3622
3623 e) For substances for which a NOAEL-A is not available but the lowest observed
3624 adverse effect level (LOAEL-A) has been derived from studies of mammalian test
3625 species exposed to the substance via oral routes including gavage, one-tenth of the
3626 LOAEL-A may be substituted for the NOAEL-A in subsection (d). The LOAEL-
3627 A must be selected in the same manner as that specified for the NOAEL-A in
3628 subsection (d).
3629

3630 f) If no studies pertaining to the toxic substance in question can be found by the
3631 Agency, no criterion can be determined.
3632

3633 (Source: Amended at 46 Ill. Reg. _____, effective _____)
3634

3635 **Section 302.648 Determining the Human Threshold Criterion**
3636

3637 The HTC is calculated according to the equation:
3638

3639
$$HTC = ADI/[W + (F \times BCF)]$$

3640

3641 where:
3642

HTC = Human health protection criterion in milligrams per liter (mg/L);

ADI = Acceptable daily intake of substance in milligrams per day (mg/d) as specified in 35 Ill. Adm. Code 302.645;

W = Per capita daily water consumption equal to 2 liters per day (L/d) for surface waters at the point of intake of a public or food processing water supply, or equal to 0.01 liters per day (L/d) which represents incidental exposure through contact or ingestion of small volumes of water while swimming or during other recreational activities for areas which are determined to be public access areas under 35 Ill. Adm. Code Section 302.102 (b)(3), or 0.001 liters per day (L/d) for other waters;

F = Assumed daily fish consumption in the United States equal to 0.020 kilograms per day (kg/d); and

BCF = Aquatic organism Bioconcentration Factor with units of liter per kilogram (L/kg) as derived in 35 Ill. Adm. Code 302.660 through 302.666.

3643
3644 (Source: Amended at 46 Ill. Reg. _____, effective _____)
3645

3646 **Section 302.651 The Human Nonthreshold Criterion**

3647
3648 The Human Nonthreshold Criterion (HNC) of a substance is that concentration or level of a
3649 substance at which humans are protected from an unreasonable risk of disease caused by a
3650 nonthreshold toxic mechanism as a result of incidental exposure to or ingestion of surface waters
3651 of the State and from ingestion of aquatic organisms taken from surface waters of the State.
3652 HNCs are derived for those toxic substances for which any exposure, regardless of extent,
3653 carries some risk of damage as specified in subsections (a) and (b).

- 3654
- 3655 a) For single substances, a risk level of one in one million (1 in 1,000,000) must be
3656 allowed (i.e, considered acceptable) for the purposes of determining an HNC.
 - 3657
 - 3658 b) For mixtures of substances, an additive risk level of one in one hundred thousand
3659 (1 in 100,000) must be allowed (i.e, considered acceptable) for the purposes of
3660 determining an HNC.

3661
3662 (Source: Amended at 46 Ill. Reg. _____, effective _____)

3663
3664 **Section 302.654 Determining the Risk Associated Intake**

3665
3666 The Risk Associated Intake (RAI) is the maximum amount of a substance which if ingested daily
3667 for a lifetime is expected to result in the risk of one additional case of human cancer in a
3668 population of one million. Where more than one carcinogenic chemical is present, the RAI must
3669 be based on an allowed additive risk of one additional case of cancer in a population of one
3670 hundred thousand. The RAI must be derived as specified in subsections (a) through (c).

- 3671
- 3672 a) For those substances for which a human epidemiologic study has been performed,
3673 the RAI equals the product of the dose from exposure in units of milligrams
3674 toxicant per kilogram body weight per day (mg/kg-d) that results in a 70-year
3675 lifetime cancer probability of one in one million, times the average weight of an
3676 adult human of 70 kilograms (kg). The resulting RAI is expressed in milligrams
3677 toxicant per day (mg/d). If more than one human epidemiologic study is
3678 available, the lowest exposure level resulting in a 70-year lifetime probability of
3679 cancer equal to a ratio of one in one hundred thousand must be used in calculating
3680 the RAI.
 - 3681
 - 3682 b) In the absence of an epidemiologic study, for those toxic substances for which a
3683 carcinogenic potency factor (CPF) has been derived from studies of mammalian
3684 test species the risk associated intake is calculated from the equation:

3685
3686
$$\text{RAI} = K/\text{CPF}$$

3687
3688 Where:

3689

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RAI = Risk associated intake in milligrams per day (mg/d);
K = A constant consisting of the product of the average weight of an adult human, assumed to be 70 kg, and the allowed cancer risk level of one in one million (1/1,000,000); and
CPF = Carcinogenic Potency Factor is the risk of one additional cancer per unit dose from exposure. The CPF is expressed in units of inverse milligrams per kilogram - day (l/mg/kg-d) as derived in subsections (b)(1) through (b)(7).

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- 1) Only those studies which fulfill the data requirement criteria of 35 Ill. Adm. Code 302.606 must be used in calculating the CPF.
 - 2) The linear non-threshold dose-response relationship developed in the same manner as in the USEPA document "Mutagenicity and Carcinogenicity Assessment of 1,3-butadiene", incorporated by reference in 35 Ill. Adm. Code 301.106, must be used in obtaining the unit risk, defined as the 95th percentile upper bound risk of one additional cancer resulting from a life time exposure to a unit concentration of the substance being considered. The CPF must be estimated from the unit risk in compliance with subsection (b)(7). In calculating a CPF, the Agency must review alternate scientifically valid protocols if so requested.
 - 3) If in a study of a single species more than one type of tumor is induced by exposure to the toxic substance, the highest of the CPFs is used.
 - 4) If two or more studies vary in either species, strain or sex of the test animal, or in tumor type, the highest CPF is used.
 - 5) If more than one tumor of the same type is found in some of the test animals, these should be pooled so that the dose response relationship is dose versus number of tumors per animal. The potency estimate for this dose response relationship is used if it is higher than estimates resulting from other methods.
 - 6) If two or more studies are identical regarding species, strain and sex of the test animal, and tumor type, the highest of the CPFs is used.
 - 7) Calculation of an equivalent dose between animal species and humans using a surface area conversion, and conversion of units of exposure to dose in milligrams of toxicant per kilogram of body weight per day (mg/kg-d) must be performed as specified in the USEPA document "Mutagenicity and Carcinogenicity Assessment of 1,3-butadiene", incorporated by reference in 35 Ill. Adm. Code 301.106.

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- c) If both a human epidemiologic study and a study of mammalian test species are available for use in subsections (a) and (b), the risk associated intake is determined as follows:
 - 1) When the human epidemiologic study provides evidence of a carcinogenic effect on humans, the RAI is calculated from the human epidemiology study as specified in subsection (a).
 - 2) When the mammalian study provides evidence a carcinogenic effect on humans, but the human epidemiologic study does not, a cancer risk to humans is assumed and the risk associated intake is calculated as specified in subsection (b).

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

Section 302.657 Determining the Human Nonthreshold Criterion

The HNC is calculated according to the equation:

$$HNC = RAI/[W + (F \times BCF)]$$

where:

- HNC = Human Nonthreshold Protection Criterion in milligrams per liter (mg/L);
- RAI = Risk Associated Intake of a substance in milligrams per day (mg/d) which is associated with a lifetime cancer risk level equal to a ratio of one to 1,000,000 as derived in 35 Ill. Adm. Code 302.654;
- W = Per capita daily water consumption equal to 2 liters per day (L/d) for surface waters at the point of intake of a public or food processing water supply, or equal to 0.01 liters per day (L/d) which represents incidental exposure through contact or ingestion of small volumes of water while swimming or during other recreational activities for areas which are determined to be public access areas under 35 Ill. Adm. Code 302.102(b)(3), or 0.001 liters per day (L/d) for other waters;
- F = Assumed daily fish consumption in the United States equal to 0.020 kilograms per day (kg/d); and
- BCF = Aquatic Life Bioconcentration Factor with units of liter per kilogram (L/kg) as derived in 35 Ill. Adm. Code 302.663.

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3750 (Source: Amended at 46 Ill. Reg. _____, effective _____)

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3752 **Section 302.658 Stream Flow for Application of Human Nonthreshold Criterion**

3753

3754 The HNC applies at all times except during periods when flows are less than the harmonic mean
3755 flow (Q_{hm}), as determined by:

3756

$$3757 \quad Q_{hm} = N / \text{SUM}(1/Q_i)$$

3758

3759 Where:

3760

- 3761 Q_{hm} = harmonic mean flow,
- 3762 N = number of daily values for stream flows, and
- 3763 Q_i = daily streamflow value on day i.

3764

3765 (Source: Amended at 46 Ill. Reg. _____, effective _____)

3766

3767 **Section 302.663 Determination of Bioconcentration Factors**

3768

3769 A Bioconcentration Factor equals the concentration of a substance in all or part of an aquatic
3770 organism in milligrams per kilogram of wet tissue weight (mg/kg), divided by the concentration
3771 of the substance in the water to which the organism is exposed in milligrams of the substance per
3772 liter of water (mg/L).

3773

3774 a) The Bioconcentration Factor is calculated from a field study if the following
3775 conditions are met:

3776

3777 1) Data are available to show that the concentration of the substance in the
3778 water to which the organism was exposed remained constant over the
3779 range of territory inhabited by the organism and for a period of time
3780 exceeding 28 days;

3781

3782 2) Competing mechanisms for removal of the substance from solution did not
3783 affect the bioavailability of the substance; and

3784

3785 3) The concentration of the substance to which the organism was exposed is
3786 less than the lowest concentration causing any adverse effects on the
3787 organism.

3788

3789 b) In the absence of a field-derived Bioconcentration Factor, the Bioconcentration
3790 Factor is calculated from a laboratory test if the following conditions are met:

3791

3792 1) The Bioconcentration Factor was calculated from measured concentrations
3793 of the toxic substance in the test solution;

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- 2) The laboratory test was of sufficient duration to have reached steady-state which is defined as a less than 10 percent change in the calculated Bioconcentration Factor over a 2-day period or 16 percent of the test duration whichever is longer. In the absence of a laboratory test which has reached steady-state, the Bioconcentration Factor may be calculated from a laboratory test with a duration greater than 28 days if more than one test is available for the same species of organism;
 - 3) The concentration of the toxic substance to which the test organism was exposed is less than the lowest concentration causing any adverse effects on the organism;
 - 4) If more than one Bioconcentration Factor for the same species is available, the geometric mean of the Bioconcentration Factors is used; and
 - 5) The Bioconcentration Factor is calculated on a wet tissue weight basis. A Bioconcentration Factor calculated using dry tissue weight must be converted to a wet tissue weight basis by multiplying the dry weight bioconcentration value by 0.1 for plankton and by 0.2 for individual species of fishes and invertebrates.

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- c) In the absence of any Bioconcentration Factors measured from field studies as specified in subsection (a) or laboratory studies which have reached steady-state as specified in subsection (b), the Bioconcentration Factor is calculated according to the equation:

3818
3819

$$\log \text{BCF} = A + B \log K_{ow}$$

3820
3821

Where:

3822
3823

BCF = Bioconcentration Factor;

3824
3825
3826
3827
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3829

K_{ow} = The octanol/water partition coefficient measured as specified in ASTM E 1147, incorporated by reference in 35 Ill. Adm. Code 301.106 (If the K_{ow} is not available from laboratory testing, it must be calculated from structure-activity relationships or available regression equations.); and

3830
3831
3832
3833
3834

The constants A = -0.23 and B = 0.76 must be used unless a change in the value of the constants is requested (The Agency must honor requests for changes only if such changes are accompanied by scientifically valid supporting data.).

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3835 (Source: Amended at 46 Ill. Reg. _____, effective _____)

3836

3837 **Section 302.666 Utilizing the Bioconcentration Factor**

3838

3839 The Bioconcentration Factor derived in 35 Ill. Adm. Code 302.663 is used to calculate water
3840 quality criteria for a substance as specified below:

3841

3842 a) When calculating a WDAPC as described in 35 Ill. Adm. Code 302.633, the
3843 geometric mean of all available steady-state whole body Bioconcentration Factors
3844 for fish and shellfish species which constitutes or represents a portion of the diet
3845 of indigenous wild and domestic animal species is used. Additional considerations
3846 in deriving a Bioconcentration Factor include:

3847

3848 1) An edible portion Bioconcentration Factor is converted to a whole body
3849 Bioconcentration Factor for a fish or shellfish species by multiplying the
3850 edible portion Bioconcentration Factor by the ratio of the percent lipid in
3851 the whole body to the percent lipid in the edible portion of the same
3852 species.

3853

3854 2) A Bioconcentration Factor calculated as described in 35 Ill. Adm. Code
3855 302.663(c) is converted to a whole body Bioconcentration Factor by
3856 multiplying the calculated Bioconcentration Factor by the ratio of the
3857 percent lipid in the whole body to 7.6.

3858

3859 b) When calculating either a human threshold criterion or a human nonthreshold
3860 criterion as described in 35 Ill. Adm. Code 302.642 through 302.648 and 35 Ill.
3861 Adm. Code 302.651 through 302.657, respectively, the geometric mean of all
3862 available edible portion Bioconcentration Factors for fish and shellfish species
3863 consumed by humans is used. Additional considerations in deriving a
3864 Bioconcentration Factor include:

3865

3866 1) Edible portions include:

3867

3868 A) Decapods – muscle tissue.

3869

3870 B) Bivalve molluscs – total living tissue.

3871

3872 C) Scaled fishes – boneless, scaleless filets including skin except for
3873 bloater chubs in which the edible portion is the whole body
3874 excluding head, scales and viscera.

3875

3876 D) Smooth-skinned fishes – boneless, skinless filets.

3877

3878 2) A whole body Bioconcentration Factor is converted to an edible portion

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3879 Bioconcentration Factor by multiplying the whole body Bioconcentration
3880 Factor of a species by the ratio of the percent lipid in the edible portion to
3881 the percent lipid in the whole body of the same species.
3882

3883 3) A Bioconcentration Factor calculated as described in 35 Ill. Adm. Code
3884 302.663 is converted to an edible portion Bioconcentration Factor by
3885 multiplying the calculated Bioconcentration Factor by the ratio of the
3886 percent lipid in the edible portion to 7.6.
3887

3888 (Source: Amended at 46 Ill. Reg. _____, effective _____)
3889

3890 **Section 302.669 Listing of Derived Criteria**

3891
3892 a) The Agency must develop and maintain a listing of toxicity criteria pursuant to
3893 this Subpart. This list must be made available to the public and updated whenever
3894 a new criterion is derived and must be published when updated in the Illinois
3895 Register.
3896

3897 b) A criterion published pursuant to subsection (a) may be proposed to the Board for
3898 adoption as a numeric water quality standard.
3899

3900 c) The Agency must maintain for inspection all information including assumptions,
3901 toxicity data and calculations used to derive any toxicity criterion listed pursuant
3902 to subsection (a) until adopted by the Board as a water quality standard.
3903

3904 (Source: Amended at 46 Ill. Reg. _____, effective _____)
3905

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3906 **Section 302.APPENDIX A References to Previous Rules (Repealed)**

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3908
3909
3910

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

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3911 **Section 302.APPENDIX B Sources of Codified Sections (Repealed)**

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3913

3914

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



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0 TITLE 35: ENVIRONMENTAL PROTECTION
 1 SUBTITLE C: WATER POLLUTION
 2 CHAPTER I: POLLUTION CONTROL BOARD
 3

4 PART 302
 5 WATER QUALITY STANDARDS
 6

7 SUBPART A: GENERAL WATER QUALITY PROVISIONS
 8

9Section

- 10302.100 Definitions
- 11302.101 Scope and Applicability
- 12302.102 Allowed Mixing, Mixing Zones and ZIDs
- 13302.103 Stream Flows
- 14302.104 Main River Temperatures
- 15302.105 Antidegradation

16
 17 SUBPART B: GENERAL USE WATER QUALITY STANDARDS

18

19Section

- 20302.201 Scope and Applicability
- 21302.202 Purpose
- 22302.203 Offensive Conditions
- 23302.204 pH
- 24302.205 Phosphorus
- 25302.206 Dissolved Oxygen
- 26302.207 Radioactivity
- 27302.208 Numeric Standards for Chemical Constituents
- 28302.209 Fecal Coliform
- 29302.210 Other Toxic Substances
- 30302.211 Temperature
- 31302.212 Total Ammonia Nitrogen
- 32302.213 Effluent Modified Waters (Ammonia) (Repealed)

33

34 SUBPART C: PUBLIC AND FOOD PROCESSING WATER SUPPLY STANDARDS

35

36Section

- 37302.301 Scope and Applicability

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38302.302	Algicide Permits
39302.303	Finished Water Standards
40302.304	Chemical Constituents
41302.305	Other Contaminants
42 302.306 <u>302.306</u>	Fecal Coliform
43302.307	Radium 226 and 228
44	
45	SUBPART D: CHICAGO AREA WATERWAY SYSTEM AND
46	LOWER DES PLAINES RIVER WATER QUALITY AND
47	INDIGENOUS AQUATIC LIFE STANDARDS
48	
49	Section
50302.401	Scope and Applicability
51302.402	Purpose
52302.403	Unnatural Sludge
53302.404	pH
54302.405	Dissolved Oxygen
55302.406	Fecal Coliform (Repealed)
56302.407	Chemical Constituents
57302.408	Temperature
58302.409	Cyanide for the South Fork of the South Branch of the Chicago River (Bubbly
59	Creek)
60302.410	Other Toxic Substances
61302.412	Total Ammonia Nitrogen
62	
63	SUBPART E: LAKE MICHIGAN BASIN WATER QUALITY STANDARDS
64	
65	Section
66302.501	Scope, Applicability, and Definitions
67302.502	Dissolved Oxygen
68302.503	pH
69302.504	Chemical Constituents
70302.505	Fecal Coliform
71302.506	Temperature
72302.507	Thermal Standards for Existing Sources on January 1, 1971
73302.508	Thermal Standards for Sources Under Construction But Not In Operation on
74	January 1, 1971
75302.509	Other Sources

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76302.510	Incorporations by Reference (Repealed)
77302.515	Offensive Conditions
78302.520	Regulation and Designation of Bioaccumulative Chemicals of Concern (BCCs)
79302.521	Supplemental Antidegradation Provisions for Bioaccumulative Chemicals of
80	Concern (BCCs)
81302.525	Radioactivity
82302.530	Supplemental Mixing Provisions for Bioaccumulative Chemicals of Concern
83	(BCCs)
84302.535	Ammonia Nitrogen
85302.540	Other Toxic Substances
86302.545	Data Requirements
87302.550	Analytical Testing
88302.553	Determining the Lake Michigan Aquatic Toxicity Criteria or Values – General
89	Procedures
90302.555	Determining the Tier I Lake Michigan Acute Aquatic Toxicity Criterion
91	(LMAATC): Independent of Water Chemistry
92302.560	Determining the Tier I Lake Michigan Basin Acute Aquatic Life Toxicity
93	Criterion (LMAATC): Dependent on Water Chemistry
94302.563	Determining the Tier II Lake Michigan Basin Acute Aquatic Life Toxicity Value
95	(LMAATV)
96302.565	Determining the Lake Michigan Basin Chronic Aquatic Life Toxicity Criterion
97	(LMCATC) or the Lake Michigan Basin Chronic Aquatic Life Toxicity Value
98	(LMCATV)
99302.570	Procedures for Deriving Bioaccumulation Factors for the Lake Michigan Basin
100302.575	Procedures for Deriving Tier I Water Quality Criteria and Values in the Lake
101	Michigan Basin to Protect Wildlife
102302.580	Procedures for Deriving Water Quality Criteria and Values in the Lake Michigan
103	Basin to Protect Human Health – General
104302.585	Procedures for Determining the Lake Michigan Basin Human Health Threshold
105	Criterion (LMHHTC) and the Lake Michigan Basin Human Health Threshold
106	Value (LMHHTV)
107302.590	Procedures for Determining the Lake Michigan Basin Human Health
108	Nonthreshold Criterion (LMHHNC) or the Lake Michigan Basin Human Health
109	Nonthreshold Value (LMHHNV)
110302.595	Listing of Bioaccumulative Chemicals of Concern, Derived Criteria and Values
111	
112	SUBPART F: PROCEDURES FOR DETERMINING WATER QUALITY CRITERIA
113	

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114	Section	
115302.601		Scope and Applicability
116302.603		Definitions
117302.604		Mathematical Abbreviations
118302.606		Data Requirements
119302.612		Determining the Acute Aquatic Toxicity Criterion for an Individual Substance –
120		General Procedures
121302.615		Determining the Acute Aquatic Toxicity Criterion – Toxicity Independent of
122		Water Chemistry
123302.618		Determining the Acute Aquatic Toxicity Criterion – Toxicity Dependent on Water
124		Chemistry
125302.621		Determining the Acute Aquatic Toxicity Criterion – Procedure for Combinations
126		of Substances
127302.627		Determining the Chronic Aquatic Toxicity Criterion for an Individual Substance –
128		General Procedures
129302.630		Determining the Chronic Aquatic Toxicity Criterion – Procedure for
130		Combinations of Substances
131302.633		The Wild and Domestic Animal Protection Criterion
132302.642		The Human Threshold Criterion
133302.645		Determining the Acceptable Daily Intake
134302.648		Determining the Human Threshold Criterion
135302.651		The Human Nonthreshold Criterion
136302.654		Determining the Risk Associated Intake
137302.657		Determining the Human Nonthreshold Criterion
138302.658		Stream Flow for Application of Human Nonthreshold Criterion
139302.660		Bioconcentration Factor
140302.663		Determination of Bioconcentration Factor
141302.666		Utilizing the Bioconcentration Factor
142302.669		Listing of Derived Criteria
143		
144302.	APPENDIX A	References to Previous Rules (Repealed)
145302.	APPENDIX B	Sources of Codified Sections (Repealed)
146302.	APPENDIX C	Maximum total ammonia nitrogen concentrations allowable for certain
147		combinations of pH and temperature
148	302.TABLE A	pH-Dependent Values of the AS (Acute Standard)
149	302.TABLE B	Temperature and pH-Dependent Values of the CS (Chronic
150		Standard) for Fish Early Life Stages Absent

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151 302.TABLE C Temperature and pH-Dependent Values of the CS (Chronic
152 Standard) for Fish Early Life Stages Present
153302.APPENDIX D Section 302.206(d): Stream Segments for Enhanced Dissolved Oxygen
154 Protection
155

156AUTHORITY: Implementing Section 13 and authorized by Sections 11(b) and 27 of the
157Environmental Protection Act [415 ILCS 5/13, 11(b), and 27].

158

159SOURCE: Filed with the Secretary of State January 1, 1978; amended at 2 Ill. Reg. 44, p. 151,
160effective November 2, 1978; amended at 3 Ill. Reg. 20, p. 95, effective May 17, 1979; amended
161at 3 Ill. Reg. 25, p. 190, effective June 21, 1979; codified at 6 Ill. Reg. 7818; amended at 6 Ill.
162Reg. 11161, effective September 7, 1982; amended at 6 Ill. Reg. 13750, effective October 26,
1631982; amended at 8 Ill. Reg. 1629, effective January 18, 1984; peremptory amendments at 10 Ill.
164Reg. 461, effective December 23, 1985; amended at R87-27 at 12 Ill. Reg. 9911, effective May
16527, 1988; amended at R85-29 at 12 Ill. Reg. 12082, effective July 11, 1988; amended in R88-1 at
16613 Ill. Reg. 5998, effective April 18, 1989; amended in R88-21(A) at 14 Ill. Reg. 2899, effective
167February 13, 1990; amended in R88-21(B) at 14 Ill. Reg. 11974, effective July 9, 1990; amended
168in R94-1(A) at 20 Ill. Reg. 7682, effective May 24, 1996; amended in R94-1(B) at 21 Ill. Reg.
169370, effective December 23, 1996; expedited correction at 21 Ill. Reg. 6273, effective December
17023, 1996; amended in R97-25 at 22 Ill. Reg. 1356, effective December 24, 1997; amended in
171R99-8 at 23 Ill. Reg. 11249, effective August 26, 1999; amended in R01-13 at 26 Ill. Reg. 3505,
172effective February 22, 2002; amended in R02-19 at 26 Ill. Reg. 16931, effective November 8,
1732002; amended in R02-11 at 27 Ill. Reg. 166, effective December 20, 2002; amended in R04-21
174at 30 Ill. Reg. 4919, effective March 1, 2006; amended in R04-25 at 32 Ill. Reg. 2254, effective
175January 28, 2008; amended in R07-9 at 32 Ill. Reg. 14978, effective September 8, 2008;
176amended in R11-18 at 36 Ill. Reg. 18871, effective December 12, 2012-; amended in R11-18(B)
177at 37 Ill. Reg. 7493, effective May 16, 2013; amended ~~at~~ in R08-09(D) at 39 Ill. Reg. 9388,
178effective July 1, 2015; amended in R18-23 at 46 Ill. Reg. _____, effective _____.

179

180 SUBPART A: GENERAL WATER QUALITY PROVISIONS

181

182Section 302.100 Definitions

183

184Unless otherwise specified, the definitions of the Environmental Protection Act (Act) [415 ILCS
1855] and 35 Ill. Adm. Code 301 apply to this Part. As used in this Part, each of the following
186definitions has the specified meaning.

187

188 "Acute Toxicity" means the capacity of any substance or combination of

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189 substances to cause mortality or other adverse effects in an organism resulting
190 from a single or short-term exposure to the substance.

191
192 "Adverse Effect" means any gross or overt effect on an organism, including but
193 not limited to reversible histopathological damage, severe convulsions,
194 irreversible functional impairment and lethality, as well as any non-overt effect on
195 an organism resulting in functional impairment or pathological lesions which may
196 affect the performance of the whole organism, or which reduces an organism's
197 ability to respond to an additional challenge.

198
199 "Chronic Toxicity" means the capacity of any substance or combination of
200 substances to cause injurious or debilitating effects in an organism which result
201 from exposure for a time period representing a substantial portion of the natural
202 life cycle of that organism, including but not limited to the growth phase, the
203 reproductive phases or such critical portions of the natural life cycle of that
204 organism.

205
206 "Criterion" means the numerical concentration of one or more toxic substances
207 derived in ~~compliance~~~~accordance~~compliance with the procedures in Subpart F ~~of~~
208 ~~this Part~~ which, if not exceeded, would assure compliance with the narrative
209 toxicity standard of 35 Ill. Adm. ~~Code~~SectionCode 302.210 ~~of this Part~~.

210
211 "Early Life Stages" of fish means the pre-hatch embryonic period, the post-hatch
212 free embryo or yolk-sac fry, and the larval period, during which the organism
213 feeds. Juvenile fish, which are anatomically similar to adults, are not considered
214 an early life stage.

215
216 "Hardness" means a water quality parameter or characteristic consisting of the
217 sum of calcium and magnesium concentrations expressed in terms of equivalent
218 milligrams per liter as calcium carbonate. Hardness is measured in
219 ~~compliance~~~~accordance~~compliance with methods specified in 40 CFR 136,
220 incorporated by reference in 35 Ill. Adm. Code 301.106.

221
222 "Mixing Zone" means a portion of the waters of the State identified as a region
223 within which mixing is allowed under 35 Ill. Adm. ~~Code~~pursuant to SectionCode
224 302.102(d) ~~of this Part~~.

225

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226 "Thermocline" means the plane of maximum rate of decrease of temperature
227 with respect to depth in a thermally stratified body of water.
228

229 "Total Residual Chlorine" or "TRC" means those substances which include
230 combined and uncombined forms of both chlorine and bromine and which are
231 expressed, by convention, as an equivalent concentration of molecular chlorine.
232 TRC is measured in ~~compliance~~accordance~~compliance~~ with methods specified in
233 40 CFR 136, incorporated by reference in 35 Ill. Adm. Code 301.106.
234

235 "Toxic Substance" means a chemical substance that causes adverse effects in
236 humans, or in aquatic or terrestrial animal or plant life. Toxic substances include,
237 but are not limited to, those substances listed in 40 CFR 302.4, incorporated by
238 reference in 35 Ill. Adm. Code 301.106, or any "chemical substance" as defined
239 by the Illinois Chemical Safety Act [430 ILCS 45]
240

241 "ZID" or "Zone of Initial Dilution" means a portion of a mixing zone, identified
242 pursuant to 35 Ill. Adm. ~~Code~~Section Code 302.102(e) ~~of this Part~~, within which
243 acute toxicity standards need not be met.
244

245 (Source: Amended at 46 Ill. Reg. _____, effective _____)
246

247 **Section 302.101 Scope and Applicability**
248

249 a) This Part contains ~~schedules of~~ water quality standards which ~~apply~~are
250 ~~applicable~~apply throughout the State as designated in 35 Ill. Adm. Code 303. Site
251 specific water quality standards are found with the water use designations in 35
252 Ill. Adm. Code 303.
253

254 b) Subpart B contains general use water quality standards which must be met in
255 waters of the State for which there is no specific use designation (35 Ill. Adm.
256 Code 303.201).
257

258 c) Subpart C contains the public and food processing water supply standards. These
259 are cumulative with Subpart B and must be met by all designated waters at the
260 point at which water is drawn for treatment and distribution as a potable supply or
261 for food processing (35 Ill. Adm. Code 303.202).
262

263 d) Subpart D contains the Chicago Area ~~Water~~Waterway System and the Lower Des

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264 Plains River water quality standards. These standards must be met only by
265 certain waters designated in 35 Ill. Adm. Code 303.204, 303.220, 303.225,
266 303.227, 303.230, 303.235, 303.240 and 303.449. Subpart D also contains water
267 quality standards applicable to indigenous aquatic life waters found only in the
268 South Fork of the South Branch of the Chicago River (Bubbly Creek).

269
270 e) Subpart E contains the Lake Michigan Basin water quality standards. These must
271 be met in the waters of the Lake Michigan Basin as designated in 35 Ill. Adm.
272 Code 303.443.

273
274 f) Subpart F contains the procedures for determining each of the criteria designated
275 in 35 Ill. Adm. ~~Code Sections~~ Code 302.210 and 302.410.

276
277 ~~g) Unless the contrary is clearly indicated, all references to "Parts" or "Sections" are~~
278 ~~to Ill. Adm. Code, Title 35: Environmental Protection. For example, "Part 309"~~
279 ~~is 35 Ill. Adm. Code 309, and "Section 309.101" is 35 Ill. Adm. Code 309.101.~~

280
281 (Source: Amended at 46 Ill. Reg. _____, effective – _____)

282
283 **Section 302.102 Allowed Mixing, Mixing Zones and ZIDs**

284
285 a) Whenever a water quality standard is more restrictive than its corresponding
286 effluent standard, or where there is no corresponding effluent standard specified at
287 35 Ill. Adm. Code 304, an opportunity will ~~shall~~ be allowed for compliance with
288 35 Ill. Adm. Code 304.105 by mixture of an effluent with its receiving waters,
289 provided the discharger has made every effort to comply with the requirements of
290 35 Ill. Adm. Code 304.102.

291
292 b) The portion, volume and area of any receiving waters within which mixing is
293 allowed pursuant to subsection (a) must ~~shall~~ be limited by the following:

294
295 1) Mixing must be confined in an area or volume of the receiving water no
296 larger than the area or volume which would result after incorporation of
297 outfall design measures to attain optimal mixing efficiency of effluent and
298 receiving waters. These measures may include the, ~~but are not limited to,~~
299 use of diffusers and engineered location and configuration of discharge
300 points.

301

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- 302 2) Mixing is not allowed in waters which include a tributary stream entrance
303 if the mixing occludes the tributary mouth or otherwise restricts the
304 movement of aquatic life into or out of the tributary.
305
306 3) Mixing is not allowed in water adjacent to bathing beaches, bank fishing
307 areas, boat ramps or dockages or any other public access area.
308
309 4) Mixing is not allowed in waters containing mussel beds, endangered
310 species habitat, fish spawning areas, areas of important aquatic life
311 habitat, or any other natural features vital to the well being of aquatic life
312 in ~~such~~ a manner that ~~maintaining the maintenance of~~ maintaining aquatic
313 life in the body of water as a whole would be adversely affected.
314
315 5) Mixing is not allowed in waters that contain intake structures of public or
316 food processing water supplies, points of withdrawal of water for
317 irrigation, or watering areas accessed by wild or domestic animals.
318
319 6) Mixing must allow for a zone of passage for aquatic life in which water
320 quality standards are met. However, a zone of passage is not required in
321 receiving streams that have zero flow for at least seven consecutive days
322 recurring on average in nine years out of 10.
323
324 7) The area and volume in which mixing occurs, alone or in combination
325 with other areas and volumes of mixing, must not intersect any area of any
326 body of water in such a manner that the maintenance of aquatic life in the
327 body of water as a whole would be adversely affected.
328
329 8) The area and volume in which mixing occurs, alone or in combination
330 with other areas and volumes of mixing, must not contain more than 25%
331 of the cross-sectional area or volume of flow of a stream except for those
332 streams for which the dilution ratio is less than 3:1. In streams where the
333 dilution ratio is less than 3:1, the volume in which mixing occurs, alone or
334 in combination with other volumes of mixing, must not contain more than
335 50 % of the volume flow unless an applicant for an NPDES permit
336 demonstrates, pursuant to subsection (d), that an adequate zone of passage
337 is provided for pursuant to subsection (b)(6).
338
339 9) No mixing is allowed when the water quality standard for the constituent

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- 340 in question is already violated in the receiving water.
341
342 10) No body of water may be used totally for mixing of single outfall or
343 combination of outfalls, except as provided in subsection (b)(6).
344
345 11) Single sources of effluents that have more than one outfall ~~must~~shallmust
346 be limited to a total area and volume of mixing no larger than that
347 allowable if a single outfall were used.
348
349 12) The area and volume in which mixing occurs must be as small as is
350 practicable under the limitations prescribed in this subsection (b), and in
351 no circumstances may the mixing encompass a surface area larger than 26
352 acres.
353
354 c) All water quality standards of this Part must be met at every point outside of the
355 area and volume of the receiving water within which mixing is allowed. The
356 acute toxicity standards of this Part must be met within the area and volume
357 within which mixing is allowed, except as provided in subsection (e).
358
359 d) Pursuant to the procedures of Section 39 of the Act and 35 Ill. Adm. Code 309, a
360 person may apply to the Agency to include as a condition in an NPDES permit
361 formal definition of the area and volume of the waters of the State within which
362 mixing is allowed for the NPDES discharge in question. The defined area and
363 volume of allowed mixing shall constitute a "mixing zone" for the purposes of 35
364 Ill. Adm. Code: Subtitle C. Upon proof by the applicant that a proposed mixing
365 zone conforms with the requirements of Section 39 of the Act, this ~~section~~Section
366 and any additional limitations as may be imposed by the Clean Water Act (CWA)
367 (33 ~~USC~~U.S.C. 1251 et seq.), the Act or Board regulations, the Agency ~~must~~shall,
368 ~~under~~pursuant tomust, under Section 39(b) of the Act, include within the NPDES
369 permit a condition defining the mixing zone.
370
371 e) ~~Under~~Pursuant toUnder the procedures of Section 39 of the Act and 35 Ill. Adm.
372 Code 309, a person may apply to the Agency to include as a condition in an
373 NPDES permit a ZID as a component portion of a mixing zone. The ZID must
374 ~~shall, at a minimum,~~ be limited to waters within which effluent dispersion is
375 immediate and rapid. For ~~the purposes of~~ this subsection, "immediate" dispersion
376 means an effluent's merging with receiving waters without delay in time after its
377 discharge and within close proximity of the end of the discharge pipe, so as to

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378 minimize the length of exposure time of aquatic life to undiluted effluent, and
379 "rapid" dispersion means an effluent's merging with receiving waters so as to
380 minimize the length of exposure time of aquatic life to undiluted effluent. Upon
381 proof by the applicant that a proposed ZID conforms with the requirements of
382 Section 39 of the Act and this Section, the Agency must ~~undershall, pursuant~~
383 ~~to~~under Section 39(b) of the Act, include within the NPDES permit a condition
384 defining the ZID.
385

- 386 f) Under ~~Pursuant to~~ Section 39 of the Act and 35 Ill. Adm. Code 309.103, an
387 applicant for an NPDES permit must ~~shall~~ submit data to allow the Agency to
388 determine that the nature of any mixing zone or mixing zone in combination with
389 a ZID conforms with the requirements of Section 39 of the Act and of this
390 Section. A permittee may appeal Agency determinations concerning a mixing
391 zone or ZID ~~underpursuant to~~under the procedures of Section 40 of the Act and
392 35 Ill. Adm. Code 309.181.
393

- 394 g) When a mixing zone is defined in an NPDES permit, the waters within that
395 mixing zone, for the duration of that NPDES permit, constitutes ~~shall constitute~~
396 the sole waters within which mixing is allowed for the permitted discharge. It
397 ~~will~~shall~~will~~ not be a defense in any action brought pursuant to 35 Ill. Adm. Code
398 304.105 that the area and volume of waters within which mixing may be allowed
399 pursuant to subsection (b) is less restrictive than the area or volume or waters
400 encompassed in the mixing zone.
401

- 402 h) When a mixing zone is explicitly denied in a NPDES permit, no waters may be
403 used for mixing by the discharge to which the NPDES permit applies, all other
404 provisions of this Section notwithstanding.
405

- 406 i) Where an NPDES permit is silent on the matter of a mixing zone, or when no
407 NPDES permit is in effect, the burden of proof ~~will~~shall~~will~~ be on the discharger
408 to demonstrate compliance with this Section in any action brought pursuant to 35
409 Ill. Adm. Code 304.105.
410

411 (Source: Amended at 46 Ill. Reg. _____, effective _____)
412

413 Section 302.103 Stream Flows

414

415 Except as otherwise provided in this Chapter, the water quality standards in this Part ~~shall~~ apply

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416at all times except during periods when flows are less than the average minimum seven day low
417flow which occurs once in ten years.

418

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

420

421**Section 302.105 Antidegradation**

422

423This ~~The purpose of this~~ Section protects ~~is to protect~~ existing uses of all waters of the State of
424Illinois, maintains ~~maintain~~ the quality of waters with quality that is better than water quality
425standards, and prevents ~~prevent~~ unnecessary deterioration of waters of the State.

426

427

a) Existing Uses

428

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

432

433

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

437

438

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

441

442

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

445

446

b) Outstanding Resource Waters

447

448

1) Waters that are designated as Outstanding Resource Waters (ORWs)
449 pursuant to 35 Ill. Adm. Code 303.205 and listed in 35 Ill. Adm. Code
450 303.206 must not be lowered in quality except as provided below:

451

452

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

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- B) Existing site stormwater discharges that comply with applicable federal and State stormwater management regulations and do not result in a violation of any water quality standards.
- 2) Any activity in subsection (b)(1)(A) or (b)(1)(B) that requires a National Pollutant Discharge Elimination System (NPDES) permit or a Clean Water Act (CWA) Section 401 certification must also comply with subsection (c)(2).
- 3) Any activity listed in subsection (b)(1) or any other proposed increase in pollutant loading to an ORW must also meet the following requirements:
 - A) All existing uses of the water will be fully protected; and
 - B) Except for activities falling under one of the exceptions provided in subsection (b)(1)(A) or (B) above:
 - i) The proposed increase in pollutant loading is necessary for an activity that will improve water quality in the ORW; and
 - ii) The improvement could not be practicably achieved without the proposed increase in pollutant loading.
- 4) Any proposed increase in pollutant loading requiring an NPDES permit or a CWA 401 certification for an ORW must be assessed pursuant to subsection (f) to determine compliance with this Section.
- c) High Quality Waters
 - 1) Except as otherwise provided in subsection (d) ~~of this Section~~, waters of the State whose existing quality is better than any of the established standards of this Part must be maintained in their present high quality, unless the lowering of water quality is necessary to accommodate important economic or social development.
 - 2) The Agency must assess any proposed increase in pollutant loading that necessitates a new, renewed or modified NPDES permit or any activity

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492 requiring a CWA Section 401 certification to determine compliance with
493 this Section. The assessment to determine compliance with this Section
494 must be made on a case-by-case basis. In making this assessment, the
495 Agency must:

- 496
- 497 A) Consider the fate and effect of any parameters proposed for an
498 increased pollutant loading.
- 499
- 500 B) Assure the following:
- 501
- 502 i) The applicable numeric or narrative water quality standard
503 will not be exceeded as a result of the proposed activity;
- 504
- 505 ii) All existing uses will be fully protected;
- 506
- 507 iii) All technically and economically reasonable measures to
508 avoid or minimize the extent of the proposed increase in
509 pollutant loading have been incorporated into the proposed
510 activity; and
- 511
- 512 iv) The activity that results in an increased pollutant loading
513 will benefit the community at large.
- 514
- 515 C) ~~Use~~UtilizeUse the following information sources, when available:
- 516
- 517 i) Information, data or reports available to the Agency from
518 its own sources;
- 519
- 520 ii) Information, data or reports supplied by the applicant;
- 521
- 522 iii) Agency experience with factually similar permitting
523 scenarios; and
- 524
- 525 iv) Any other valid information available to the Agency.
- 526
- 527 d) Activities Not Subject to a Further Antidegradation Assessment
528 The following activities will not be subject to a further antidegradation
529 assessment ~~under~~pursuant tounder subsection (c) ~~of this Section.~~

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- 1) Short-term, temporary (i.e., weeks or months) lowering of water quality;
- 2) Bypasses that are not prohibited at 40 CFR 122.41(m), incorporated by reference at 35 Ill. Adm. Code 301.106;
- 3) Response actions ~~underpursuant to~~under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, corrective actions, ~~underpursuant to~~under the Resource Conservation and Recovery Act (RCRA), as amended, or similar federal or State authority, taken to alleviate a release into the environment of hazardous substances, pollutants or contaminants which may pose a danger to public health or welfare;
- 4) Thermal discharges that have been approved through a CWA Section 316(a) demonstration;
- 5) New or increased discharges of a non-contact cooling water:
 - A) without additives, except as provided in subsection (d)(5)(B), returned to the same body of water from which it was taken, as defined by 35 Ill. Adm. Code 352.104, provided that the discharge complies with applicable Illinois thermal standards; or
 - B) containing chlorine when the non-contact cooling water is treated to remove residual chlorine, and returned to the same body of water from which it was taken, as defined in 35 Ill. Adm. Code 352.104, provided that the discharge complies with applicable Illinois thermal and effluent standards at 35 Ill. Adm. Code 302, 303, and 304;
- 6) Discharges permitted under a current general NPDES permit as provided by 415 ILCS 5/39(b) or a nationwide or regional CWA Section 404 permit are not subject to facility-specific antidegradation review; however, the Agency must assure that individual permits or certifications are required prior to all new pollutant loadings or hydrological modifications that necessitate a new, renewed or modified NPDES permit or CWA Section 401 certification that affects waters of particular biological significance,

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568 which may include streams identified by the Illinois Department of
569 Natural Resources as "biologically significant". ~~Waters of particular~~
570 ~~biological significance may include streams listed in a 1991 publication by~~
571 ~~the Illinois Department of Conservation entitled "Biologically Significant~~
572 ~~Illinois Streams"~~; or

573
574 7) Changing or ~~including~~ ~~Changes to or inclusion of~~ including a new permit
575 limitation that does not result in an actual increase of a pollutant loading,
576 such as those stemming from improved monitoring data, new analytical
577 testing methods, new or revised technology or water quality based effluent
578 limits.

579
580 e) Lake Michigan Basin
581 Waters in the Lake Michigan basin as identified in 35 Ill. Adm. Code 303.443 are
582 also subject to the requirements applicable to bioaccumulative chemicals of
583 concern found at 35 Ill. Adm. ~~Code~~ Section Code 302.521 ~~of this Part~~.

584
585 f) Antidegradation Assessments
586 In conducting an antidegradation assessment ~~under~~ pursuant to under this Section,
587 the Agency must comply with the following procedures.

588
589 1) A permit application for any proposed increase in pollutant loading that
590 necessitates the issuance of a new, renewed, or modified NPDES permit or
591 a CWA Section 401 certification must include, to the extent necessary for
592 the Agency to determine that the permit application meets the
593 requirements of this Section, the following information:

594
595 A) Identification and characterization of the water body affected by
596 the proposed load increase or proposed activity and the existing
597 water body's uses. Characterization must address physical,
598 biological and chemical conditions of the water body.

599
600 B) Identification and quantification of the proposed load increases for
601 the applicable parameters and of the potential impacts of the
602 proposed activity on the affected waters.

603
604 C) The purpose and anticipated benefits of the proposed activity.
605 Such benefits may include:

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- i) Providing a centralized wastewater collection and treatment system for a previously unsewered community;
 - ii) ~~ExpandingExpansion~~Expanding to provide service for anticipated residential or industrial growth consistent with a community's long range urban planning;
 - iii) ~~AddingAddition of~~Adding a new product line or production increase or modification at an industrial facility; or
 - iv) Increasing or ~~retainingAn increase or the retention of~~retaining current employment levels at a facility.
- D) Assessments of alternatives to proposed increases in pollutant loading or activities subject to Agency certification ~~underpursuant to~~under Section 401 of the CWA that result in less of a load increase, no load increase or minimal environmental degradation. Such alternatives may include:
- i) Additional treatment levels, including no discharge alternatives;
 - ii) Discharge of waste to alternate locations, including publicly-owned treatment works and streams with greater assimilative capacity; or
 - iii) Manufacturing practices that incorporate pollution prevention techniques.
- E) Any additional information the Agency may request.
- F) Proof that a copy of the application has been provided to the Illinois Department of Natural Resources.
- 2) The Agency must complete an antidegradation assessment in ~~complianceaccordance~~compliance with the provisions of this Section on a case-by-case basis.

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- A) The Agency must consider the criteria stated in 35 Ill. Adm. ~~Code~~Section~~Code~~ 302.105(c)(2).
- B) The Agency must consider the information provided by the applicant ~~underpursuant to~~under subsection (f)(1).
- C) After its assessment, the Agency must produce a written analysis addressing the requirements of this Section and provide a decision yielding one of the following results:
 - i) If the proposed activity meets the requirements of this Section, then the Agency must proceed with public notice of the NPDES permit or CWA Section 401 certification and include the written analysis as a part of the fact sheet accompanying the public notice;
 - ii) If the proposed activity does not meet the requirements of this Section, then the Agency must provide a written analysis to the applicant and must be available to discuss the deficiencies that led to the disapproval. The Agency may suggest methods to remedy the conflicts with the requirements of this Section;
 - iii) If the proposed activity does not meet the requirements of this Section, but some lowering of water quality is allowable, then the Agency will contact the applicant with the results of the review. If the reduced loading increase is acceptable to the applicant, upon the receipt of an amended application, the Agency will proceed to public notice; or if the reduced loading increase is not acceptable to the applicant, the Agency will transmit its written review to the applicant in the context of an NPDES permit denial or a CWA Section 401 certification denial.
- 3) The Agency will conduct public notice and public participation through the public notice procedures found in 35 Ill. Adm. Code 309.109 or CWA

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682 Section 401 certifications. The Agency must incorporate the following
683 information into a fact sheet accompanying the public notice:

- 684
- 685 A) A description of the activity, including identification of water
686 quality parameters for which there will be an increased pollutant
687 loading;
- 688
- 689 B) Identification of the affected surface water body or water body
690 segment, any downstream surface water body or water body
691 segment also expected to experience a lowering of water quality,
692 characterization of the designated and current uses of the affected
693 surface water body or water body segment and identification of
694 which uses are most sensitive to the proposed load increase;
- 695
- 696 C) A summary of any review comments and recommendations
697 provided by Illinois Department of Natural Resources, local or
698 regional planning commissions, zoning boards and any other
699 entities the Agency consults regarding the proposal;
- 700
- 701 D) An overview of alternatives considered by the applicant and
702 identification of any provisions or alternatives imposed to lessen
703 the load increase associated with the proposed activity; and
704
- 705 E) The name and telephone number of a contact person at the Agency
706 who can provide additional information.

707
708 (Source: Amended at 46 Ill. Reg. _____, effective _____)
709

710 SUBPART B: GENERAL USE WATER QUALITY STANDARDS

711
712 **Section 302.201 Scope and Applicability**
713

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

716
717 (Source: Amended at 46 Ill. Reg. _____, effective _____)
718

719 **Section 302.202 Purpose**

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720

721 The General Use standards will protect the State's water for aquatic life (~~except as provided in~~
722 ~~Section 302.213~~), wildlife, agricultural use, secondary contact use and most industrial uses and
723 ensure the aesthetic quality of the State's aquatic environment. Primary contact uses are
724 protected for all General Use waters whose physical configuration permits such use.

725

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

727

728 Section 302.203 Offensive Conditions

729

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

734

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

736

737 Section 302.204 pH

738

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

741

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

743

744 Section 302.205 Phosphorus

745

746 Phosphorus (~~STORET number 00665~~): After December 31, 1983, Phosphorus as P must ~~shall~~
747 not exceed 0.05 milligram per liter (mg/L) in any reservoir or lake with a surface area of 8.1
748 hectares (20 acres) or more, or in any stream at the point where it enters any such reservoir or
749 lake. For ~~the purposes of~~ this Section, the term "reservoir or lake" does ~~shall~~ not include low
750 level pools constructed in free flowing streams or any body of water which is an integral part of
751 an operation which includes the application of sludge on land. Point source discharges which
752 comply with 35 Ill. Adm. ~~CodeSectionCode~~ 304.123 must ~~shall~~ be in compliance with this
753 Section for purposes of application of 35 Ill. Adm. ~~CodeSectionCode~~ 304.105.

754

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

756

757 Section 302.206 Dissolved Oxygen

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758

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

761

762 a) General use waters at all locations must maintain sufficient dissolved oxygen
763 concentrations to prevent offensive conditions as required in 35 Ill. Adm.
764 ~~Code Section Code~~ 302.203 ~~of this Part.~~ Quiescent and isolated sectors of General
765 Use waters including ~~but not limited to~~ wetlands, sloughs, backwaters and waters
766 below the thermocline in lakes and reservoirs must be maintained at sufficient
767 dissolved oxygen concentrations to support their natural ecological functions and
768 resident aquatic communities.

769

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

774

775 1) During the period of March through July,

776

777 A) 5.0 mg/L at any time; and

778

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

780

781 2) During the period of August through February,

782

783 A) 3.5 mg/L at any time;

784

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

786

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

788

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

791

792 1) During the period of March through July,

793

794 A) 5.0 mg/L at any time; and

795

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- 796 B) 6.25 mg/L as a daily mean averaged over 7 days.
797
798 2) During the period of August through February,
799
800 A) 4.0 mg/L at any time;
801
802 B) 4.5 mg/L as a daily minimum averaged over 7 days; and
803
804 C) 6.0 mg/L as a daily mean averaged over 30 days.
805
806 d) Assessing attainment of dissolved oxygen mean and minimum values.
807
808 1) Daily mean is the arithmetic mean of dissolved oxygen concentrations in
809 24 consecutive hours.
810
811 2) Daily minimum is the minimum dissolved oxygen concentration in 24
812 consecutive hours.
813
814 3) The measurements of dissolved oxygen used to determine attainment or
815 lack of attainment with any of the dissolved oxygen standards in this
816 Section must assure daily minima and daily means that represent the true
817 daily minima and daily means.
818
819 4) The dissolved oxygen concentrations used to determine a daily mean or
820 daily minimum should not exceed the air-equilibrated concentration.
821
822 5) ~~"Daily minimum averaged over 7 days"~~ means the arithmetic mean of
823 daily minimum dissolved oxygen concentrations in 7 consecutive 24-hour
824 periods.
825
826 6) ~~"Daily mean averaged over 7 days"~~ means the arithmetic mean of daily
827 mean dissolved oxygen concentrations in 7 consecutive 24-hour periods.
828
829 7) ~~"Daily mean averaged over 30 days"~~ means the arithmetic mean of daily
830 mean dissolved oxygen concentrations in 30 consecutive 24-hour periods.
831

832 (Source: Amended at 46 Ill. Reg. _____, effective _____)
833

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834 **Section 302.207 Radioactivity**

835

836 a) Gross beta (~~STORET number 03501~~) concentration must ~~shall~~ not exceed 100
837 picocuries per liter (pCi/L).

838

839 ~~b)~~ b) Strontium 90 (~~STORET number 13501~~) concentration must not exceed 2 ~~picocuries~~
840 ~~per liter~~ (pCi/L).

841

842 c) The annual average radium 226 and 228 (~~STORET number 11503~~) combined
843 concentration must not exceed 3.75 ~~picocuries per liter~~ (pCi/L).

844

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

846

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

848

849 a) The acute standard (AS) for the chemical constituents listed in subsection (e)
850 must ~~shall~~ not be exceeded at any time except for those waters for which a zone
851 of initial dilution (ZID) has been approved by the Agency ~~underpursuant to~~ under
852 35 Ill. Adm. ~~CodeSectionCode~~ 302.102.

853

854 b) The chronic standard (CS) for the chemical constituents listed in subsection (e)
855 must ~~shall~~ not be exceeded by the arithmetic average of at least four consecutive
856 samples collected over any period of at least four days, except for those waters in
857 which the Agency has approved a mixing zone or in which mixing is allowed
858 ~~underpursuant to~~ under 35 Ill. Adm. ~~CodeSectionCode~~ 302.102. The samples
859 used to demonstrate attainment or lack of attainment with a CS must be collected
860 in a manner that assures an average representative of the sampling period. For the
861 chemical constituents that have water quality based standards dependent upon
862 hardness, the chronic water quality standard will be calculated according to
863 subsection (e) using the hardness of the water body at the time the sample was
864 collected. To calculate attainment status of chronic ~~standards~~, the concentration
865 of the chemical constituent in each sample is divided by the calculated water
866 quality standard for the sample to determine a quotient. The water quality
867 standard is attained if the mean of the sample quotients is less than or equal to one
868 for the duration of the averaging period.

869

870 c) The human health standard (HHS) for the chemical constituents listed in
871 subsection (f) must ~~shall~~ not be exceeded when the stream flow is at or above the

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872 harmonic mean flow ~~under~~pursuant to~~under~~ 35 Ill. Adm. ~~Code~~Section~~Code~~
 873 302.658 nor ~~must~~shall~~must~~ an annual average, based on at least eight samples,
 874 collected in a manner representative of the sampling period, exceed the HHS
 875 except for those waters in which the Agency has approved a mixing zone or in
 876 which mixing is allowed under 35 Ill. Adm. ~~Code~~pursuant to~~Section~~Code
 877 302.102.

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

883
 884 e) Numeric Water Quality Standards for the Protection of Aquatic Organisms
 885

Constituent	AS (µg/L)	CS (µg/L)
Arsenic (trivalent, dissolved)	360 × <u>x</u> 1.0* = 360	190 × <u>x</u> 1.0* = 190
Boron (total)	40,100	7,600
Cadmium (dissolved)	$\frac{e^{A+B \ln(H)} \times \left\{ \frac{1.138672 - \left[(\ln(H))(0.041838) \right]}{\left[(\ln(H))(0.041838) \right]} \right\}}{e^{A+B \ln(H)} \times \left\{ \frac{1.138672 - \left[(\ln(H))(0.041838) \right]}{\left[(\ln(H))(0.041838) \right]} \right\}}^*$	$\frac{e^{A+B \ln(H)} \times \left\{ \frac{1.101672 - \left[(\ln(H))(0.041838) \right]}{\left[(\ln(H))(0.041838) \right]} \right\}}{e^{A+B \ln(H)} \times \left\{ \frac{1.101672 - \left[(\ln(H))(0.041838) \right]}{\left[(\ln(H))(0.041838) \right]} \right\}}^*$
	where A = -2.918 and B = 1.128	where A = -3.490 and B = 0.7852
Chromium (hexavalent, total)	16	11
Chromium	$e^{A+B \ln(H)} \times 0.316^*$	$e^{A+B \ln(H)} \times 0.860^*$

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(trivalent, dissolved)

$$e^{A+B \ln(H)} \times 0.316^*$$

$$e^{A+B \ln(H)} \times 0.860^*$$

where $A = 3.688$ and $B = 0.8190$

where $A = 1.561$ and $B = 0.8190$

Copper (dissolved)

$$e^{A+B \ln(H)} \times 0.960^*$$

$$e^{A+B \ln(H)} \times 0.960^*$$

$$e^{A+B \ln(H)} \times 0.960^*$$

$$e^{A+B \ln(H)} \times 0.960^*$$

where $A = -1.464$ and $B = 0.9422$

where $A = -1.465$ and $B = 0.8545$

Cyanide**

22

5.2

Fluoride (total)

$$e^{A+B \ln(H)} e^{A+B \ln(H)}$$

$e^{A+B \ln(H)} e^{A+B \ln(H)}$, but ~~must~~shall~~must~~ not exceed 4.0 mg/L

where $A = 6.0445$ and $B = 0.5394$

where $A = 6.0445$ and $B = 0.5394$

where $A = 6.7319$ and $B = 0.5394$

Lead (dissolved)

~~$$e^{A+B \ln(H)} \times \{1.46203 - \frac{1.46203}{[(\ln(H))(0.145712)]}\}^*$$~~

~~$$e^{A+B \ln(H)} \times \{1.46203 - \frac{1.46203}{[(\ln(H))(0.145712)]}\}^*$$~~

$$e^{A+B \ln(H)} \times \left\{ 1.46203 - \frac{1.46203}{[(\ln(H))(0.145712)]} \right\}^*$$

$$e^{A+B \ln(H)} \times \left\{ 1.46203 - \frac{1.46203}{[(\ln(H))(0.145712)]} \right\}^*$$

where $A = -1.301$ and $B = 1.273$

where $A = -2.863$ and $B = 1.273$

Manganese (dissolved)

$$e^{A+B \ln(H)} \times 0.9812^*$$

$$e^{A+B \ln(H)} \times 0.9812^*$$

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Manganese (dissolved)	$e^{A+B \ln(H)} \times 0.9812^*$ - where $A = 4.9187$ and $B = 0.7467$	$e^{A+B \ln(H)} \times 0.9812^*$ - where $A = 4.0635$ and $B = 0.7467$
Mercury (dissolved)	$2.6 \times 0.85^* = 2.2$	$1.3 \times 0.85^* = 1.1$
Nickel (dissolved)	$e^{A+B \ln(H)} \times 0.998^*$ $e^{A+B \ln(H)} \times 0.998^*$ where $A = 0.5173$ and $B = 0.8460$	$e^{A+B \ln(H)} \times 0.997^*$ $e^{A+B \ln(H)} \times 0.997^*$ where $A = -2.286$ and $B = 0.8460$
TRC	19	11
Zinc (dissolved)	$e^{A+B \ln(H)} \times 0.978^*$ $e^{A+B \ln(H)} \times 0.978^*$ where $A = 0.9035$ and $B = 0.8473$	$e^{A+B \ln(H)} \times 0.986^*$ $e^{A+B \ln(H)} \times 0.986^*$ where $A = -0.4456$ and $B = 0.8473$
Benzene	4200	860
Ethylbenzene	150	14
Toluene	2000	600
Xylene(s)	920	360

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 CaCO_3)
- $*$ = conversion factor multiplier for dissolved metals

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** = 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)

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888
889

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

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

890

where:
µg/L = micrograms per liter

891
892
893

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

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Selenium (total)	mg/L	1.0
Silver (total)	µg/L	5.0

894

where:

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

895

896

h) Water quality standards for sulfate are as follows:

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898

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.

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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 CaCO₃) and chloride (in mg/L) and must be met at all times:

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907

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:

908

909

910

911

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

912

913

914

where:

915

916

C = sulfate concentration

917

918

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:

919

920

921

922

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

923

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962

where:

C = sulfate concentration

- 3) The following sulfate standards must be met at all times when hardness (in mg/L as CaCO₃) and chloride (in mg/L) concentrations other than specified in (h)(2) are present:
 - A) If the hardness concentration of waters is less than 100 mg/L or chloride concentration of waters is less than 5 mg/L, the sulfate standard is 500 mg/L.
 - B) If the hardness concentration of waters is greater than 500 mg/L and the chloride concentration of waters is 5 mg/L or greater, the sulfate standard is 2,000 mg/L.
 - C) If the combination of hardness and chloride concentrations of existing waters are not reflected in subsection (h)(3)(A) or (B), the sulfate standard may be determined in a site-specific rulemaking under ~~pursuant to~~ section 303(c) of the Federal Water Pollution Control Act of 1972 (Clean Water Act), 33 ~~USC~~U.S.C. 1313, and Federal Regulations at 40 CFR 131.10(j)(2).

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

Section 302.209 Fecal Coliform

- a) During the months May through October, based on a minimum of five samples taken over not more than a 30 day period, fecal coliform (~~STORET number 31616~~) must ~~shall~~ not exceed a geometric mean of 200 per 100 milliliter (ml), nor ~~must~~shall ~~must~~ more than 10% of the samples during any 30 day period exceed 400 per 100 ml in protected waters. Protected waters are defined as waters which, due to natural characteristics, aesthetic value or environmental significance are deserving of protection from pathogenic organisms. Protected waters will meet one or both of the following conditions:
 - 1) presently support or have the physical characteristics to support primary contact;

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963

964

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

965

966

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.

967

968

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970

971

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

972

973

974

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

975

976Section 302.210 Other Toxic Substances

977

978Waters of the State must ~~shall~~ be free from any substances or combination of substances in
979concentrations toxic or harmful to human health, or to animal, plant or aquatic life. Individual
980chemical substances or parameters for which numeric standards are specified in this Subpart are
981not subject to this Section.

982

983

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

984

985

986

1) An Acute Aquatic Toxicity Criterion (AATC) validly derived and correctly applied ~~underpursuant to~~ under procedures ~~set forth~~ in 35 Ill. Adm. ~~CodeSectionsCode~~ 302.612 through 302.618 or in 35 Ill. Adm. ~~CodeSectionCode~~ 302.621; or

987

988

989

990

991

2) A Chronic Aquatic Toxicity Criterion (CATC) validly derived and correctly applied ~~underpursuant to~~ under procedures ~~set forth~~ in 35 Ill. Adm. ~~CodeSectionsCode~~ 302.627 or 302.630.

992

993

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995

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

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- 1001 c) Any substance or combination of substances must ~~shall~~ be deemed to be toxic or
1002 harmful to human health if present in concentrations that exceed criteria, validly
1003 derived and correctly applied, based on either of the following:
1004
1005 1) Disease or functional impairment due to a physiological mechanism for
1006 which there is a threshold dose below which no damage occurs calculated
1007 ~~underpursuant to~~under 35 Ill. Adm. ~~CodeSections~~Code 302.642 through
1008 302.648 (Human Threshold Criterion); or
1009
1010 2) Disease or functional impairment due to a physiological mechanism for
1011 which any dose may cause some risk of damage calculated under 35 Ill.
1012 Adm. ~~Codepursuant to Sections~~Code 302.651 through 302.658 (Human
1013 Nonthreshold Criterion).
1014
1015 d) The most stringent criterion of subsections (a), (b), and (c) ~~applies~~shall
1016 ~~apply~~applies at all points outside of any waters within which, mixing is allowed
1017 under 35 Ill. Adm. ~~Codepursuant to Section.~~ Code 302.102. In addition, the
1018 AATC derived ~~underpursuant to~~under subsection (a)(1) applies ~~shall apply~~ in all
1019 waters except that it must ~~shall~~ not apply within a ZID that is prescribed in
1020 ~~complianceeaccordance~~compliance with 35 Ill. Adm. ~~CodeSection~~Code 302.102.
1021
1022 e) The procedures of Subpart F set forth minimum data requirements, appropriate
1023 test protocols and data assessment methods for establishing criteria under
1024 ~~pursuant to~~ subsections (a), (b), and (c). No other procedures may be used to
1025 establish such criteria unless approved by the Board in a rulemaking or adjusted
1026 standards proceeding under ~~pursuant to~~ Title VII of the Act. The validity and
1027 applicability of the Subpart F procedures may not be challenged in any proceeding
1028 brought under ~~pursuant to~~ Titles VIII or X of the Act, although the validity and
1029 correctness of application of the numeric criteria derived under ~~pursuant to~~
1030 Subpart F may be challenged in such proceedings under ~~pursuant to~~ subsection
1031 (f).
1032
1033 f) Challenges to application of criteria
1034
1035 1) A permittee may challenge the validity and correctness of application of a
1036 criterion derived by the Agency under ~~pursuant to~~ this Section only at the
1037 time such criterion is first applied in an NPDES permit under ~~pursuant to~~
1038 35 Ill. Adm. Code 309.152 or in an action under ~~pursuant to~~ Title VIII of

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1039 the Act for violation of the toxicity water quality standard. Failure of a
1040 person to challenge the validity of a criterion at the time of its first
1041 application ~~will~~shallwill constitute a waiver of such challenge in any
1042 subsequent proceeding involving application of the criterion to that
1043 person.

1044
1045 2) Consistent with subsection (f)(1), if a criterion is included as, or is used to
1046 derive, a condition of an NPDES discharge permit, a permittee may
1047 challenge the criterion in a permit appeal ~~under~~pursuant tounder Section
1048 40 of the Act and 35 Ill. Adm. Code 309.181. ~~In any such action, the~~
1049 ~~Agency shall include in the record all information upon which it has relied~~
1050 ~~in developing and applying the criterion, whether such information was~~
1051 ~~developed by the Agency or submitted by the Petitioner. THE BURDEN~~
1052 ~~OF PROOF SHALL BE ON THE PETITIONER TO DEMONSTRATE~~
1053 ~~THAT THE CRITERION-BASED CONDITION IS NOT NECESSARY~~
1054 ~~TO ACCOMPLISH THE PURPOSES OF SUBSECTION (a) (Section~~
1055 ~~40(a)(1) of the Act), but there is no presumption in favor of the general~~
1056 ~~validity and correctness of the application of the criterion as reflected in~~
1057 ~~the challenged condition.~~

1058
1059 3) Consistent with subsection (f)(1), in an action where alleged violation of
1060 the toxicity water quality standard is based on alleged excursion of a
1061 criterion, the person bringing such action ~~will~~shallwill have the burdens of
1062 going forward with proof and of persuasion regarding the general validity
1063 and correctness of application of the criterion.

1064
1065 g) Subsections (a) through (e) do not apply to USEPA registered pesticides approved
1066 for aquatic application and applied ~~under~~pursuant tounder the following
1067 conditions:

1068
1069 1) Application must ~~shall~~ be made in strict ~~compliance~~accordancecompliance
1070 with label directions;

1071
1072 2) Applicator must ~~shall~~ be properly certified under the provisions of the
1073 Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 135 et seq.
1074 (1972));

1075
1076 3) Applications of aquatic pesticides must be in

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1077 ~~compliance~~~~accordance~~compliance with the laws, regulations and
1078 guidelines of all state and federal agencies authorized by law to regulate,
1079 use or supervise pesticide applications, ~~among which is included the~~
1080 ~~Department of Energy and Natural Resources pursuant to Section 3 of~~
1081 ~~"AN ACT in relation to natural resources, research, data collection and~~
1082 ~~environmental studies", Ill. Rev. Stat. 1987 ch. 96 1/2, par. 7403.~~

1083
1084 4) Aquatic ~~No aquatic~~ pesticide must not ~~shall~~ be applied to waters affecting
1085 public or food processing water supplies unless a permit to apply the
1086 pesticide has been obtained from the Agency. All permits must ~~shall~~ be
1087 issued so as not to cause a violation of the Act or of any of the Board's
1088 rules or regulations. To aid applicators in determining their
1089 responsibilities under this subsection, a list of waters affecting public
1090 water supplies will be published and maintained by the Agency's Division
1091 of Public Water Supplies.

1092
1093 (Source: Amended at 46 Ill. Reg. _____, effective _____)
1094

1095 **Section 302.211 Temperature**

1096
1097 ~~a) Temperature has STORET number (F°) 00011 and (C°) 00010.~~

1098
1099
1100 ~~a)b)~~ There must not ~~shall~~ be ~~no~~ abnormal temperature changes that may adversely
1101 affect aquatic life unless caused by natural conditions.

1102
1103 ~~b)e)~~ The normal daily and seasonal temperature fluctuations which existed before the
1104 addition of heat due to other than natural causes ~~must~~~~shall~~must be maintained.

1105
1106 ~~c)d)~~ The maximum temperature rise above natural temperatures must ~~shall~~ not exceed
1107 2.8 ~~°C~~°C (5 °F) ~~2.8° C (5° F).~~

1108
1109 ~~d)e)~~ In addition, the water temperature at representative locations in the main river
1110 must ~~shall~~ not exceed the maximum limits in the following table during more than
1111 one percent of the hours in the 12-month period ending with any month.
1112 Moreover, ~~at no time shall~~ the water temperature at such locations must never
1113 exceed the maximum limits in the following table by more than 1.7 °C (3 °F) ~~1.7°~~
1114 ~~C (3° F).~~

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	°C	°F	°C	°F
JAN.	16	60	JUL.	90
FEB.	16	60	AUG.	90
MAR.	16	60	SEPT.	90
APR.	32	90	OCT.	90
MAY	32	90	NOV.	90
JUNE	32	90	DEC.	60

	<u>°C</u>	<u>°F</u>		<u>°C</u>	<u>°F</u>
<u>JAN</u>	<u>16</u>	<u>60</u>	<u>JUL.</u>	<u>32</u>	<u>90</u>
<u>FEB.</u>	<u>16</u>	<u>60</u>	<u>AUG.</u>	<u>32</u>	<u>90</u>
<u>MAR.</u>	<u>16</u>	<u>60</u>	<u>SEPT.</u>	<u>32</u>	<u>90</u>
<u>APR.</u>	<u>32</u>	<u>90</u>	<u>OCT.</u>	<u>32</u>	<u>90</u>
<u>MAY</u>	<u>32</u>	<u>90</u>	<u>NOV.</u>	<u>32</u>	<u>90</u>
<u>JUNE</u>	<u>32</u>	<u>90</u>	<u>DEC.</u>	<u>16</u>	<u>60</u>

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e) The owner or operator of a source of heated effluent which discharges 150 megawatts (0.5 billion British thermal units per hour) or more must ~~shall~~ demonstrate in a hearing before the ~~this Pollution Control Board (Board) not less than 5 nor more than 6 years after the effective date of these regulations or,~~ Board in the case of new sources, after the commencement of operation, that discharges from that source have not caused and cannot be reasonably expected to cause significant ecological damage to the receiving waters. If the ~~demonstrations~~ such proof demonstration is not made to the satisfaction of the Board, the Board must order appropriate corrective measures to be ~~implemented~~ shall be ordered to be taken implemented within a reasonable time as determined by the Board.

f) Permits for heated effluent discharges, whether issued by the Board or the Illinois Environmental Protection Agency (Agency), can be revised if ~~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) The owner or operator of a source of heated effluent must ~~shall~~ maintain ~~such~~ records and conduct ~~such~~ studies of the effluents from the ~~such~~ sources and of

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1145 their effects as may be required by the Agency or in any permit granted under the
1146 ~~Illinois Environmental Protection Act (Act)~~Act.

1147

1148 h*h*) Appropriate corrective measures will be required if, upon complaint filed in
1149 ~~compliance~~~~accordance~~compliance with Board rules, it is found at any time that
1150 any heated effluent causes significant ecological damage to the receiving stream.

1151

1152 i*h*) All effluents to an artificial cooling lake must comply with the applicable
1153 provisions of the thermal water quality standards ~~as set forth~~ in this Section and
1154 35 Ill. Adm. Code 303, except when all of the following requirements are met:

1155

1156 1) All discharges from the artificial cooling lake to other waters of the State
1157 comply with the applicable provisions of subsections (~~aba~~) through (~~ded~~).

1158

1159 2) The heated effluent discharged to the artificial cooling lake complies with
1160 all other applicable provisions of this Chapter, except subsections (~~aba~~)
1161 through (~~ded~~).

1162

1163 3) At an adjudicative hearing the discharger must ~~shall~~ satisfactorily
1164 demonstrate to the Board that the artificial cooling lake receiving the
1165 heated effluent will be environmentally acceptable, and within the intent
1166 of the Act, including, ~~but not limited to~~:

1167

1168 A) ~~providing provision of~~providing conditions capable of supporting
1169 shellfish, fish and wildlife, and recreational uses consistent with
1170 good management practices, and

1171

1172 B) ~~controlling control of~~controlling the thermal component of the
1173 discharger's effluent by a technologically feasible and
1174 economically reasonable method.

1175

1176 4) The required ~~demonstrations~~~~showing~~demonstration in subsection (j)(3)
1177 may take the form of an acceptable final environmental impact statement
1178 or pertinent provisions of environmental assessments used in the
1179 preparation of the final environmental impact statement, or may take the
1180 form of a demonstration ~~undershowing pursuant to~~under Section 316(a) of
1181 the Clean Water Act (CWA) (33 U.S.C. 1251 et seq.), which addresses the
1182 requirements of subsection (j)(3).

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

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

Section 302.212 Total Ammonia Nitrogen

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- 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.

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1201
1202

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

1203
1204
1205
1206

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

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

1207
1208
1209

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

1210
1211
1212

- A) During the Early Life Stage Present period, as defined in subsection (e) ~~of this Section~~:

1213
1214

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

1215
1216

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

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1217

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

1218

1219

1220

ii) ii) When water temperature is above 14.51°C °C:

1221

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

1222

1223

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

1224

1225

1226

Where T = Water Temperature, degrees Celsius

1227

1228

1229

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

1230

1231

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

1232

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

1233

1234

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

1235

1236

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

1237

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

1238

1239

1240

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

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Where T = Water Temperature, degrees Celsius

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- 3) The sub-chronic standard is equal to 2.5 times the chronic standard.
- c) Attainment of the Total Ammonia Nitrogen Water Quality Standards
 - ~~1)-1)~~ 1)-1) The acute standard of total ammonia nitrogen (in mg/L) must not be exceeded at any time except in those waters for which the Agency has approved a ZID under 35 Ill. Adm. ~~Code~~pursuant to Section Code 302.102.
 - ~~2)-2)~~ 2)-2) The 30-day average concentration of total ammonia nitrogen (in mg/L) must not exceed the chronic standard (CS) except in those waters in which mixing is allowed ~~under~~pursuant to under 35 Ill. Adm. ~~Code~~Section. Code 302.102 ~~of this Part~~. Attainment of the chronic standard (CS) is evaluated ~~under~~pursuant to under subsection (d) ~~of this Section~~ by averaging at least four samples collected at weekly intervals or at other sampling intervals that statistically represent a 30-day sampling period. The samples must be collected in a manner that assures a representative sampling period.
 - ~~3)-3)~~ 3)-3) The 4-day average concentration of total ammonia nitrogen (in mg/L) must not exceed the sub-chronic standard except in those waters in which mixing is allowed under 35 Ill. Adm. ~~Code~~pursuant to Section Code 302.102. Attainment of the sub-chronic standard is evaluated pursuant to subsection (d) ~~of this Section~~ by averaging daily sample results collected over a period of four consecutive days within the 30-day averaging period. The samples must be collected in a manner that assures a representative sampling period.
- d) The water quality standard for each water body must be calculated based on the temperature and pH of the water body measured at the time of each ammonia sample. The concentration of total ammonia in each sample must be divided by the calculated water quality standard for the sample to determine a quotient. The water quality standard is attained if the mean of the sample quotients is less than or equal to one for the duration of the averaging period.
- e) The Early Life Stage Present period occurs from March through October. In

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1280 addition, during any other period when early life stages are present, and where the
1281 water quality standard does not provide adequate protection for these organisms,
1282 the water body must meet the Early Life Stage Present water quality standard. All
1283 other periods are subject to the Early Life Stage Absent period.
1284

1285 BOARD NOTE: Acute and chronic standard concentrations for total ammonia nitrogen
1286 (in mg/L) for different combinations of pH and temperature are shown in Appendix C.

1287
1288 (Source: Amended at 46 Ill. Reg. _____, effective _____)
1289

1290 SUBPART C: PUBLIC AND FOOD PROCESSING WATER SUPPLY STANDARDS

1291
1292 **Section 302.301 Scope and Applicability**
1293

1294 Subpart C contains the public and food processing water supply standards. These are cumulative
1295 with the general use standards of Subpart B and must be met in all waters designated in Part 303
1296 at any point at which water is withdrawn for treatment and distribution as a potable supply or for
1297 food processing. Waters of the State are generally designated for public and food processing use
1298 (35 Ill. Adm. [CodeSectionCode](#) 303.202).
1299

1300 (Source: Amended at 46 Ill. Reg. _____, effective _____)
1301

1302 **Section 302.302 Algicide Permits**
1303

1304 The water quality standards of Subparts B and C may be exceeded if ~~thesuchthe~~ occurrence
1305 results from ~~applyingthe application of~~ applying an algicide ~~underin accordance with the terms~~
1306 ~~of~~ [under](#) an algicide permit issued by the Agency under 35 Ill. Adm. ~~Code~~ [pursuant to PartCode](#)
1307 602.
1308

1309 ~~(Note: Prior to codification, Rules 203 and 204(d) of Ch 6: Public Water Supplies.)~~

1310 (Source: Amended at 46 Ill. Reg. _____, effective _____)
1311

1312 **Section 302.303 Finished Water Standards**
1313

1314 Water must ~~shall~~ be of such quality that with treatment consisting of coagulation, sedimentation,
1315 filtration, storage and chlorination, or other equivalent treatment processes, the treated water
1316 ~~meets~~ [shall meet in](#) ~~meets~~ all ~~respects the~~ requirements of 35 Ill. Adm. ~~Code~~ [PartCode](#) 611.
1317

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1318 (Note: Prior to codification, Table I, Rule 304 of Ch 6: Public Water Supplies)

1319

1320 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1321

1322 Section 302.304 Chemical Constituents

1323

1324 The following levels of chemical constituents must ~~shall~~ not be exceeded:

1325

1326 _____ CONCENTRATION

1327 CONSTITUENT _____ (mg/L)

1328

1329 Arsenic (total) _____ 0.05

1330 Barium (total) _____ 1.0

1331 Boron (total) _____ 1.0

1332 Cadmium (total) _____ 0.010

1333 Chloride (total) _____ 250

1334 Chromium _____ 0.05

1335 Fluoride (total) _____ 1.4

1336 Iron (dissolved) _____ 0.3

1337 Lead (total) _____ 0.05

1338 Manganese (total) _____ 1.0

1339 Nitrate-Nitrogen _____ 10

1340 Oil (hexane-solubles _____

1341 or equivalent) _____ 0.1

1342

1343 Organics _____

1344 Pesticides _____

1345 Chlorinated Hydro _____

1346 carbon Insecticides _____

1347 Aldrin _____ 0.001

1348 Chlordane _____ 0.003

1349 DDT _____ 0.05

1350 Dieldrin _____ 0.001

1351 Endrin _____ 0.0002

1352 Heptachlor _____ 0.0001

1353 Heptachlor Expoxide _____ 0.0001

1354 Lindane _____ 0.004

1355 Methoxychlor _____ 0.1

POLLUTION CONTROL BOARD

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1356	Toxaphene	0.0005
1357	Organophosphate	
1358	Insecticides	
1359	Parathion	0.1
1360	Chlorophenoxy Herbicides	
1361	2,4-Dichlorophenoxy	
1362	acetic acid (2,4-D)	0.1
1363	2-(2,4,5-Trichloro	
1364	phenoxy)-propionic	
1365	acid (2,4,5-TP	
1366	or Silvex)	0.01
1367	Phenols	0.001
1368	Selenium (total)	0.01
1369	Sulphates	250
1370	Total Dissolved Solids	500
1371		

CONSTITUENT	CONCENTRATION (mg/L)
<u>Arsenic (total)</u>	<u>0.05</u>
<u>Barium (total)</u>	<u>1.0</u>
<u>Boron (total)</u>	<u>1.0</u>
<u>Cadmium (total)</u>	<u>0.010</u>
<u>Chloride (total)</u>	<u>250</u>
<u>Chromium</u>	<u>0.05</u>
<u>Fluoride (total)</u>	<u>1.4</u>
<u>Iron (dissolved)</u>	<u>0.3</u>
<u>Lead (total)</u>	<u>0.05</u>
<u>Manganese (total)</u>	<u>1.0</u>
<u>Nitrate-Nitrogen</u>	<u>10</u>
<u>Oil (hexane-solubles or equivalent)</u>	<u>0.1</u>
<u>Organics</u>	
<u>Pesticides</u>	
<u>Chlorinated Hydro- carbon Insecticides</u>	
<u>Aldrin</u>	<u>0.001</u>
<u>Chlordane</u>	<u>0.003</u>

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<u>DDT</u>	<u>0.05</u>
<u>Dieldrin</u>	<u>0.001</u>
<u>Endrin</u>	<u>0.0002</u>
<u>Heptachlor</u>	<u>0.0001</u>
<u>Heptachlor Expoxide</u>	<u>0.0001</u>
<u>Lindane</u>	<u>0.004</u>
<u>Methoxychlor</u>	<u>0.1</u>
<u>Toxaphene</u>	<u>0.0005</u>
<u>Organophosphate</u>	
<u>Insecticides</u>	
<u>Parathion</u>	<u>0.1</u>
<u>Chlorophenoxy Herbicides</u>	
<u>2,4-Dichlorophenoxy-</u> <u>acetic acid (2,4-D)</u>	<u>0.1</u>
<u>2-(2,4,5-Trichloro-</u> <u>phenoxy)-propionic</u> <u>acid (2,4,5-TP</u> <u>or Silvex)</u>	<u>0.01</u>
<u>Phenols</u>	<u>0.001</u>
<u>Selenium (total)</u>	<u>0.01</u>
<u>Sulphates</u>	<u>250</u>
<u>Total Dissolved Solids</u>	<u>500</u>

1372

1373 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1374

1375 Section 302.305 Other Contaminants

1376

1377 Other contaminants which will not be adequately reduced by the treatment processes ~~noted~~ in 35
 1378 Ill. Adm. ~~Code~~ Section Code 302.303 ~~must shall~~ must not be present in concentrations hazardous to
 1379 human health.

1380

1381 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1382

1383 Section 302.306 Fecal Coliform

1384

1385 Notwithstanding the provisions of 35 Ill. Adm. ~~Code~~ Section Code 302.209, at no time shall the
 1386 geometric mean, based on a minimum of five samples taken over not more than a 30 day period,
 1387 of fecal coliform (~~STORET number 31616~~) exceed 2000 per 100 ml.

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NOTICE OF PROPOSED AMENDMENTS

1388

1389 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1390

1391 Section 302.307 Radium 226 and 228

1392

1393 Radium 226 and 228 (~~STORET number H1503~~) combined concentration must not exceed 5
1394 picocuries per liter (pCi/L) at any time.

1395

1396 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1397

1398 **SUBPART D: CHICAGO AREA WATERWAY SYSTEM**
1399 **AND LOWER DES PLAINES RIVER WATER QUALITY STANDARDS AND**
1400 **INDIGENOUS AQUATIC LIFE STANDARDS**

1401

1402 Section 302.401 Scope and Applicability

1403

1404 a) Subpart D contains the standards that must be met only by the South Fork of the
1405 South Branch of the Chicago River (Bubbly Creek). The Subpart B general use
1406 and Subpart C public and food processing water supply standards ~~of this Part~~ do
1407 not apply to Bubbly Creek.

1408

1409 b) Subpart D also contains the Chicago Area Waterway System and Lower Des
1410 Plains River water quality standards. Except for the Chicago River, these
1411 standards must be met only by waters specifically designated in 35 Ill. Adm. Code
1412 303. The Subpart B general use and Subpart C public and food processing water
1413 supply standards of this Part do not apply to waters described in 35 Ill. Adm.
1414 Code 303.204 as the Chicago Area Waterway System or Lower Des Plains River
1415 and listed in 35 Ill. Adm. Code 303.220 through 303.240, except that waters
1416 designated as Primary Contact Recreation Waters in 35 Ill. Adm. Code 303.220
1417 must meet the numeric water quality standard for bacteria applicable to protected
1418 waters in 35 Ill. Adm. ~~CodeSectionCode~~ 302.209 ~~of this Part~~. The Chicago River
1419 must meet the general use standards, including the numeric water quality standard
1420 for fecal coliform bacteria applicable to protected waters in 35 Ill. Adm.
1421 ~~CodeSectionCode~~ 302.209 ~~of this Part~~.

1422

1423 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1424

1425 Section 302.402 Purpose

POLLUTION CONTROL BOARD**NOTICE OF PROPOSED AMENDMENTS**

1426

1427The Chicago Area Waterway System and Lower Des Plaines River standards ~~shall~~ protect
1428primary contact, incidental contact or non-contact recreational uses (except when designated as
1429non-recreational waters); commercial activity, including navigation and industrial water supply
1430uses; and the highest quality aquatic life and wildlife that is attainable, limited only by the
1431physical condition of these waters and hydrologic modifications to these waters. The numeric
1432and narrative standards ~~contained~~ in this Part will assure the protection of the aquatic life,
1433wildlife, human health, and recreational uses of the Chicago Area Waterway System and Lower
1434Des Plaines River as those uses are defined in 35 Ill. Adm. Code 301 and designated in 35 Ill.
1435Adm. Code 303. Indigenous aquatic life standards are intended for the South Fork of the South
1436Branch of the Chicago River (Bubbly Creek), which is capable of supporting an indigenous
1437aquatic life limited only by the physical configuration of the body of water, characteristics and
1438origin of the water and the presence of contaminants in amounts that do not exceed the water
1439quality standards listed in this Subpart D. However, the Chicago River is required to meet the
1440general use standard, including the water quality standard for fecal coliform bacteria applicable
1441to protected waters in 35 Ill. Adm. [CodeSectionCode](#) 302.209 ~~of this Part~~.

1442

1443 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1444

1445Section 302.403 Unnatural Sludge

1446

1447Waters subject to this subpart must ~~shall~~ be free from unnatural sludge or bottom deposits,
1448floating debris, visible oil, odor, unnatural plant or algal growth, or unnatural color or turbidity.

1449

1450 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1451

1452Section 302.404 pH

1453

1454pH must ~~shall~~ be within the range of 6.5 to 9.0 except for natural causes, except for the South
1455Fork of the South Branch of the Chicago River (Bubbly Creek) for which pH must ~~shall~~ be
1456within the range of 6.0 to 9.0 except for natural causes.

1457

1458 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1459

1460Section 302.405 Dissolved Oxygen

1461

1462Dissolved oxygen concentrations must ~~shall~~ not be less than the applicable values in subsections
1463(a), (b), (c), and (d).

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

- b) For the Upper Dresden Island Pool Aquatic Life Use waters listed in 35 Ill. Adm. Code 303.230:
 - 1) during the period of March through July:
 - A) 6.0 mg/L as a daily mean averaged over 7 days; and
 - B) 5.0 mg/L at any time; and
 - 2) during the period of August through February:
 - A) 5.5 mg/L as a daily mean averaged over 30 days;
 - B) 4.0 mg/L as a daily minimum averaged over 7 days; and
 - C) 3.5 mg/L at any time.

- c) For the Chicago Area Waterway System Aquatic Life Use A waters listed in 35 Ill. Adm. Code 303.235:
 - 1) during the period of March through July, 5.0 mg/L at any time; and
 - 2) during the period of August through February:
 - A) 4.0 mg/L as a daily minimum averaged over 7 days; and
 - B) 3.5 mg/L at any time.

- d) For the Chicago Area Waterway System and Brandon Pool Aquatic Life Use B waters listed in 35 Ill. Adm. ~~CodeSectionCode~~ CodeSectionCode 303.240:
 - 1) 4.0 mg/L as a daily minimum averaged over 7 days; and
 - 2) 3.5 mg/L at any time.

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- e) Assessing attainment of dissolved oxygen mean and minimum values.
 - 1) Daily mean is the arithmetic mean of dissolved oxygen concentrations in 24 consecutive hours.
 - 2) Daily minimum is the minimum dissolved oxygen concentration in 24 consecutive hours.
 - 3) The measurements of dissolved oxygen used to determine attainment or lack of attainment with any of the dissolved oxygen standards in this Section must assure daily minima and daily means that represent the true daily minima and daily means.
 - 4) The dissolved oxygen concentrations used to determine a daily mean or daily minimum should not exceed the air-equilibrated concentration.
 - 5) "Daily minimum averaged over 7 days" means the arithmetic mean of daily minimum dissolved oxygen concentrations in 7 consecutive 24-hour periods.
 - 6) "Daily mean averaged over 7 days" means the arithmetic mean of daily mean dissolved oxygen concentrations in 7 consecutive 24-hour periods.
 - 7) "Daily mean averaged over 30 days" means the arithmetic mean of daily mean dissolved oxygen concentrations in 30 consecutive 24-hour periods.

1529 (Source: Amended at 46 Ill. Reg. _____, effective _____)

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1531 **Section 302.407 Chemical Constituents**

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- a) The acute standard (AS) for the chemical constituents listed in subsection (e) must ~~shall~~ not be exceeded at any time except as provided in subsection (d).
- b) The chronic standard (CS) for the chemical constituents listed in subsection (e) must ~~shall~~ not be exceeded by the arithmetic average of at least four consecutive samples collected over any period of four days, except as provided in subsection (d). The samples used to demonstrate attainment or lack of attainment with a CS

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1540 must be collected in a manner that assures an average representative of the
 1541 sampling period. For the chemical constituents that have water quality based
 1542 standards dependent upon hardness, the chronic water quality standard will be
 1543 calculated according to subsection (e) using the hardness of the water body at the
 1544 time the sample was collected. To calculate attainment status of chronic
 1545 standards, the concentration of the chemical constituent in each sample is divided
 1546 by the calculated water quality standard for the sample to determine a quotient.
 1547 The water quality standard is attained if the mean of the sample quotients is less
 1548 than or equal to one for the duration of the averaging period.
 1549

1550 c) The human health standard (HHS) for the chemical constituents listed in
 1551 subsection (f) must ~~shall~~ not be exceeded, on a 12-month rolling average based on
 1552 at least eight samples, collected in a manner representative of the sampling
 1553 period, except as provided in subsection (d).
 1554

1555 d) In waters where mixing is allowed under ~~pursuant to~~ 35 Ill. Adm.
 1556 ~~CodeSectionCode~~ 302.102 ~~of this Part~~, the following apply:
 1557

- 1558 1) The AS must ~~shall~~ not be exceeded in any waters except for those waters
 1559 for which a zone of initial dilution (ZID) applies under ~~pursuant to~~ 35 Ill.
 1560 Adm. ~~CodeSectionCode~~ 302.102 ~~of this Part~~.
- 1561 2) The CS must ~~shall~~ not be exceeded outside of waters in which mixing is
 1562 allowed under ~~pursuant to~~ 35 Ill. Adm. ~~CodeSectionCode~~ 302.102 ~~of this~~
 1563 ~~Part~~.
- 1564 3) The HHS must ~~shall~~ not be exceeded outside of waters in which mixing is
 1565 allowed under ~~pursuant to~~ 35 Ill. Adm. ~~CodeSectionCode~~ 302.102 ~~of this~~
 1566 ~~Part~~.

1567 e) Numeric Water Quality Standards for the Protection of Aquatic Organisms
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Constituent	AS (µg/L)	CS (µg/L)
Arsenic (trivalent, dissolved)	340 X 1.0*=340	150 X 1.0*=150
Benzene	4200	860

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Cadmium (dissolved)	$e^{A+B \ln(H)} X \{1.138672 - [(\ln(H)) (0.041838)]\}^*$, where $A = -2.918$ and $B = 1.128$	$e^{A+B \ln(H)} X \{1.101672 - [(\ln(H)) (0.041838)]\}^*$, where $A = -3.490$ and $B = 0.7852$
Chromium (hexavalent, total)	16	11
Chromium (trivalent, dissolved)	$e^{A+B \ln(H)} X 0.316^*$, where $A = 3.7256$ and $B = 0.8190$	$e^{A+B \ln(H)} X 0.860^*$, where $A = 0.6848$ and $B = 0.8190$
Copper (dissolved)	$e^{A+B \ln(H)} X 0.960^*$, where $A = -1.645$ and $B = 0.9422$	$e^{A+B \ln(H)} X 0.960^*$, where $A = -1.646$ and $B = 0.8545$
Cyanide**	22	10
Ethylbenzene	150	14
Fluoride (total)	$e^{A+B \ln(H)}$, where $A = 6.7319$ and $B = 0.5394$	$e^{A+B \ln(H)}$, but must <u>shall</u> not exceed 4.0 mg/L , where $A = 6.0445$ and $B = 0.5394$
Lead (dissolved)	$e^{A+B \ln(H)} X \{1.46203 - [(\ln(H)) (0.145712)]\}^*$, where $A = -1.301$ and $B = 1.273$	$e^{A+B \ln(H)} X \{1.46203 - [(\ln(H)) (0.145712)]\}^*$, where $A = -2.863$ and $B = 1.273$
Manganese (dissolved)	$e^{A+B \ln(H)} X 0.9812^*$, where $A = 4.9187$ and $B = 0.7467$	$e^{A+B \ln(H)} X 0.9812^*$, where $A = 4.0635$ and $B = 0.7467$
Mercury (dissolved)	$1.4 X 0.85^* = 1.2$	$0.77 X 0.85^* = 0.65$
Nickel (dissolved)	$e^{A+B \ln(H)} X 0.998^*$, where $A = 0.5173$ and $B = 0.8460$	$e^{A+B \ln(H)} X 0.997^*$, where $A = -2.286$ and $B = 0.8460$
Toluene	2000	600
TRC	19	11
Xylene(s)	920	360

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Zinc (dissolved)	$e^{A+B \ln(H)} \times 0.978^*$, where A=0.9035 and B=0.8473	$e^{A+B \ln(H)} \times 0.986^*$, where A =-0.4456 and B=0.8473
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where:

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

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

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

~~$\ln(H)$ = natural logarithm of Hardness in mg/L as CaCO_3 milligrams per liter,~~

~~* = conversion factor multiplier for dissolved metals, and~~

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

<u>$\mu\text{g/L}$</u>	<u>=</u>	<u>microgram per liter</u>
<u>H</u>	<u>=</u>	<u>Hardness concentration of receiving water in mg/L as CaCO_3</u>
<u>e^x</u>	<u>=</u>	<u>base of natural logarithms raised to the x-power</u>
<u>$\ln(H)$</u>	<u>=</u>	<u>natural logarithm of Hardness in mg/L as CaCO_3</u>
<u>*</u>	<u>=</u>	<u>conversion factor multiplier for dissolved metals</u>
<u>**</u>	<u>=</u>	<u>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)</u>

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

~~Constituent — HHS in micrograms per liter (µg/L)~~

~~Benzene — 310~~

~~Mercury (total) — 0.012~~

~~Phenols — 860,000~~

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

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where:

~~µg/L = microgram per liter.~~

µg/L = microgram per liter

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- g) Numeric Water Quality Standards for Other Chemical Constituents

- 1) Concentrations of the following chemical constituents must ~~shall~~ not be exceeded except in waters for which mixing is allowed under ~~pursuant to~~ 35 Ill. Adm. ~~CodeSectionCode~~ 302.102 ~~of this Part.~~

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

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where:

~~mg/L = milligram per liter,~~

~~µg/L = microgram per liter,~~

~~H = Hardness concentration of receiving water in mg/L as CaCO₃,~~

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

~~exp[*] = base of natural logarithms raised to the x power,~~

~~ln(H) = natural logarithm of Hardness in milligrams per liter, and~~

~~* = conversion factor multiplier for dissolved metals~~

~~2) From July 1, 2015 until July 1, 2018, the following concentrations for Chloride and Total Dissolved Solids must shall not be exceeded except in waters for which mixing is allowed under pursuant to 35 Ill. Adm. Code 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

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3)

mg/L = milligram per liter
µg/L = microgram per liter
H = Hardness concentration of receiving water in mg/L as

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	<u>CaCO₃</u>
<u>C</u>	≡ <u>Chloride concentration of receiving water in mg/L</u>
<u>e^x</u>	≡ <u>base of natural logarithms raised to the x-power</u>
<u>ln(H)</u>	≡ <u>natural logarithm of Hardness in milligrams per liter</u>
<u>*</u>	≡ <u>conversion factor multiplier for dissolved metals</u>

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<u>2)</u>		

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Beginning July 1, 2018, the ~~Chloride and Total Dissolved Solids standards in subsection (g)(2) of this Section are repealed and the~~ following concentration for Chloride must ~~shall~~ not be exceeded except in waters for which mixing is allowed under ~~pursuant to~~ 35 Ill. Adm. ~~Code~~ Section Code 302.102 ~~of this Part~~:

Constituent	Unit	Standard
Chloride	mg/L	500

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where:

~~mg/L = milligram per liter~~

mg/L ≡ milligram per liter

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

CONSTITUENT	STORET NUMBER	CONCENTRATION (mg/L)
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Ammonia Un-ionized (as N*)	00612	0.1
Arsenic (total)	01002	1.0
Barium (total)	01007	5.0
Cadmium (total)	01027	0.15
Chromium (total hexavalent)	01032	0.3
Chromium (total trivalent)	01033	1.0
Copper (total)	01042	1.0
Cyanide (total)	00720	0.10
Fluoride (total)	00951	15.0
Iron (total)	01045	2.0
Iron (dissolved)	01046	0.5
Lead (total)	01051	0.1
Manganese (total)	01055	1.0
Mercury (total)	71900	0.0005
Nickel (total)	01067	1.0
Oil, fats and grease	00550, 00556 or 00560	15.0**
Phenols	32730	0.3
Selenium (total)	01147	1.0
Silver	01077	1.1
Zinc (total)	01092	1.0
Total Dissolved Solids	70300	1500

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

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

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

where:

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

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~~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~~

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

U = Concentration of un-ionized ammonia as N in mg/L
N = Concentration of ammonia nitrogen as N in mg/L
T = Temperature in degrees Celsius

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

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

1681 **Section 302.408 Temperature**

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- a) For the South Fork of the South Branch of the Chicago River (Bubbly Creek), temperature (~~STORET number (°F) 00011 and (°C) 00010~~) ~~must~~shall~~must~~ not exceed 34 °C (93 °F) ~~34°C (93°F)~~ more than 5% of the time, or 37.8 °C (~~100 °F~~) ~~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 ~~must~~will~~must~~ not exceed temperature (~~STORET number (°F) 00011 and (°C) 00010~~) of 34 °C (93 °F) ~~34°C (93°F)~~ more than 5% of the time, or 37.8 °C (~~100 °F~~) ~~37.8°C (100°F)~~ at any time.
- c) There must not ~~shall~~ be ~~no~~ abnormal temperature changes that may adversely affect aquatic life unless caused by natural conditions.
- d) The normal daily and seasonal temperature fluctuations that existed before the addition of heat due to other than natural causes ~~must~~shall~~must~~ be maintained.

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- e) The maximum temperature rise above natural temperatures must never ~~shall not~~ exceed 2.8 ~~°C (5 °F)~~ 2.8° C (5° F).
- f) Water temperature at representative locations in the main river must never ~~shall not~~ exceed the maximum limits in the applicable table in subsections (g), (h) and (i), during more than one percent of the hours in the 12-month period ending with any month. ~~Moreover, at no time shall the~~ The water temperature must not exceed the maximum limits in the applicable table that follows by more than 1.7 ~~°C (3.0 °F)~~ 1.7° C (3.0° F).
- g) Water temperature in the Chicago Area Waterway System Aquatic Life Use A waters listed in 35 Ill. Adm. Code 303.235 ~~must shall~~ must not exceed the limits in the following table in ~~compliance accordance~~ compliance with subsection (f):

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

Months	Daily Maximum	
	(°C)	(°F)
January	16	60
February	16	60
March	16	60

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<u>April</u>	<u>32</u>	<u>90</u>
<u>May</u>	<u>32</u>	<u>90</u>
<u>June</u>	<u>32</u>	<u>90</u>
<u>July</u>	<u>32</u>	<u>90</u>
<u>August</u>	<u>32</u>	<u>90</u>
<u>September</u>	<u>32</u>	<u>90</u>
<u>October</u>	<u>32</u>	<u>90</u>
<u>November</u>	<u>32</u>	<u>90</u>
<u>December</u>	<u>16</u>	<u>60</u>

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

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

<u>Months</u>	<u>Daily Maximum</u>	
	<u>(° C)</u>	<u>(°F)</u>
<u>January</u>	<u>16</u>	<u>60</u>
<u>February</u>	<u>16</u>	<u>60</u>
<u>March</u>	<u>16</u>	<u>60</u>

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<u>April</u>	<u>32</u>	<u>90</u>
<u>May</u>	<u>32</u>	<u>90</u>
<u>June</u>	<u>32</u>	<u>90</u>
<u>July</u>	<u>32</u>	<u>90</u>
<u>August</u>	<u>32</u>	<u>90</u>
<u>September</u>	<u>32</u>	<u>90</u>
<u>October</u>	<u>32</u>	<u>90</u>
<u>November</u>	<u>32</u>	<u>90</u>
<u>December</u>	<u>16</u>	<u>60</u>

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

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

<u>Months</u>	<u>Daily Maximum</u>	
	<u>(° C)</u>	<u>(° F)</u>
<u>January</u>	<u>16</u>	<u>60</u>
<u>February</u>	<u>16</u>	<u>60</u>
<u>March</u>	<u>16</u>	<u>60</u>
<u>April</u>	<u>32</u>	<u>90</u>

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<u>May</u>	<u>32</u>	<u>90</u>
<u>June</u>	<u>32</u>	<u>90</u>
<u>July</u>	<u>32</u>	<u>90</u>
<u>August</u>	<u>32</u>	<u>90</u>
<u>September</u>	<u>32</u>	<u>90</u>
<u>October</u>	<u>32</u>	<u>90</u>
<u>November</u>	<u>32</u>	<u>90</u>
<u>December</u>	<u>16</u>	<u>60</u>

1775

1776 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1777

1778Section 302.409 Cyanide for the South Fork of the South Branch of the Chicago River

1779(Bubbly Creek)

1780

1781Cyanide (total) must ~~shall~~ not exceed 0.10 mg/L in the South Fork of the South Branch of the
1782Chicago River (Bubbly Creek).

1783

1784 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1785

1786Section 302.410 Other Toxic Substances

1787

1788Any substance or combination of substances toxic to aquatic life not listed in Section 302.407

1789must ~~shall~~ not exceed one-half of the 96-hour median tolerance limit (96-hour TL_m) for native

1790fish or essential fish food organisms in the South Fork of the South Branch of the Chicago River

1791(Bubbly Creek). All other Chicago Area Waterway System and Lower Des Plaines River waters

1792as designated in 35 Ill. Adm. Code 303 must ~~shall~~ be free from any substances or combination of

1793substances in concentrations toxic or harmful to human health, or to animal, plant or aquatic life.

1794Individual chemical substances or parameters for which numeric standards are specified in this

1795Subpart are not subject to this Section.

1796

1797 a) Any substance or combination of substances will ~~shall~~ be deemed to be toxic or
1798 harmful to aquatic life if present in concentrations that exceed the following:

1799

1800 1) An Acute Aquatic Toxicity Criterion (AATC) validly derived and
1801 correctly applied ~~underpursuant to~~ under procedures ~~set forth~~ in 35 Ill.

1802 Adm. ~~CodeSectionsCode~~ 302.612 through 302.618 ~~of this Part~~ or in 35 Ill.

1803 Adm. ~~CodeSectionCode~~ 302.621 ~~of this Part~~; or

1804

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- 1805 2) A Chronic Aquatic Toxicity Criterion (CATC) validly derived and
1806 correctly applied ~~underpursuant to~~under procedures ~~set forth~~ in 35 Ill.
1807 Adm. Code ~~Section~~302.627 or 302.630 ~~of this Part~~.
- 1808
- 1809 b) Any substance or combination of substances will ~~shall~~ be deemed to be toxic or
1810 harmful to wild or domestic animal life if present in concentrations that exceed
1811 any Wild and Domestic Animal Protection Criterion (WDAPC) validly derived
1812 and correctly applied under ~~pursuant to~~ 35 Ill. Adm. ~~CodeSection~~Code 302.633 ~~of~~
1813 ~~this Part~~.
- 1814
- 1815 c) Any substance or combination of substances will ~~shall~~ be deemed to be toxic or
1816 harmful to human health if present in concentrations that exceed criteria, validly
1817 derived and correctly applied, based on either of the following:
- 1818
- 1819 1) Disease or functional impairment due to a physiological mechanism for
1820 which there is a threshold dose below which no damage occurs calculated
1821 under ~~pursuant to~~ 35 Ill. Adm. ~~CodeSections~~Code 302.642 through
1822 302.648 (Human Threshold Criterion) ~~of this Part~~; or
- 1823
- 1824 2) Disease or functional impairment due to a physiological mechanism for
1825 which any dose may cause some risk of damage calculated under ~~pursuant~~
1826 ~~to~~ 35 Ill. Adm. ~~CodeSections~~Code 302.651 through 302.658 (Human
1827 Nonthreshold Criterion) ~~of this Part~~.
- 1828
- 1829 d) The most stringent criterion of subsections (a), (b) and (c) applies ~~shall apply~~ at
1830 all points outside of any waters within which, mixing is allowed under ~~pursuant to~~
1831 35 Ill. Adm. ~~CodeSection~~Code 302.102 ~~of this Part~~. In addition, the AATC
1832 derived under ~~pursuant to~~ subsection (a)(1) applies ~~shall apply~~ in all waters except
1833 that it must ~~shall~~ not apply within a ZID that is prescribed in
1834 ~~complianceeaccordance~~compliance with 35 Ill. Adm. ~~CodeSection~~Code 302.102 ~~of~~
1835 ~~this Part~~.
- 1836
- 1837 e) The procedures of Subpart F set forth minimum data requirements, appropriate
1838 test protocols, and data assessment methods for establishing criteria under
1839 ~~pursuant to~~ subsections (a), (b) and (c). No other procedures may be used to
1840 establish such criteria unless approved by the Board in a rulemaking or adjusted
1841 standard proceeding under ~~pursuant to~~ Title VII of the Act. The validity and
1842 applicability of the Subpart F procedures may not be challenged in any proceeding

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1843 brought under ~~pursuant to~~ Title VIII or X of the Act, although the validity and
1844 correctness of application of the numeric criteria derived under ~~pursuant to~~
1845 Subpart F may be challenged in the proceedings under ~~pursuant to~~ subsection (f).

1846
1847 f) Agency derived criteria may be challenged as follows:

1848
1849 1) A permittee may challenge the validity and correctness of application of a
1850 criterion derived by the Agency under ~~pursuant to~~ this Section only at the
1851 time the criterion is first applied in an NPDES permit under ~~pursuant to~~ 35
1852 Ill. Adm. Code 309.152 or in an action under ~~pursuant to~~ Title VIII of the
1853 Act for violation of the toxicity water quality standard. Failure of a person
1854 to challenge the validity of a criterion at the time of its first application
1855 constitutes ~~shall constitute~~ a waiver of the challenge in any subsequent
1856 proceeding involving application of the criterion to that person.

1857
1858 2) Consistent with subsection (f)(1), if a criterion is included as, or is used to
1859 derive, a condition of an NPDES discharge permit, a permittee may
1860 challenge the criterion in a permit appeal under ~~pursuant to~~ Section 40 of
1861 the Act and 35 Ill. Adm. Code 309.181. In any such action, the Agency
1862 must ~~shall~~ include in the record all information upon which it has relied in
1863 developing and applying the criterion, whether that information was
1864 developed by the Agency or submitted by the Petitioner. The burden of
1865 proof is ~~shall be~~ on the ~~petitioner~~ Petitioner to demonstrate that the
1866 criterion-based condition is not necessary to accomplish the purposes of
1867 subsection (f)(1) (see Section 40(a)(1) of the Act), but there is no
1868 presumption in favor of the general validity and correctness of the
1869 application of the criterion as reflected in the challenged condition.

1870
1871 3) Consistent with subsection (f)(1), in an action in which alleged violation
1872 of the toxicity water quality standard is based on alleged excursion of a
1873 criterion, the person bringing the action has ~~shall have~~ the burdens of
1874 going forward with proof and of persuasion regarding the general validity
1875 and correctness of application of the criterion.

1876
1877 g) Subsections (a) through (e) do not apply to USEPA registered pesticides approved
1878 for aquatic application and applied ~~underpursuant to~~ under the following
1879 conditions:
1880

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- 1881 1) Application must ~~shall~~ be made in strict ~~compliance~~~~accordance~~compliance
- 1882 with label directions;
- 1883
- 1884 2) Applicator must ~~shall~~ be properly certified under the provisions of the
- 1885 Federal Insecticide, Fungicide, and Rodenticide Act (7 ~~USE~~U.S.C. 135 et
- 1886 seq. (1972)); and
- 1887
- 1888 3) Applications of aquatic pesticides must ~~comply~~~~be in accordance~~comply
- 1889 with the laws, regulations and guidelines of all state and federal agencies
- 1890 authorized by law to regulate, use or supervise pesticide applications.
- 1891

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

1894 **Section 302.412 Total Ammonia Nitrogen**

- 1895
- 1896 a) This Section does not apply to the South Fork of the South Branch of the Chicago
- 1897 River (Bubbly Creek).
- 1898
- 1899 b) For the Chicago Area Waterway System and the Lower Des Plaines River
- 1900 described in 35 Ill. Adm. Code 303.204 and listed in 35 Ill. Adm. Code 303.220
- 1901 through 303.240, total ammonia nitrogen must in no case exceed 15 mg/L.
- 1902
- 1903 c) The total ammonia nitrogen acute, chronic, and sub-chronic standards are
- 1904 determined in ~~compliance~~~~accordance~~compliance with the equations in
- 1905 subsections (c)(1) and (c)(2). Attainment of each standard must be determined in
- 1906 ~~compliance~~~~accordance~~compliance with subsections (d) and (e) in mg/L.
- 1907

- 1908 1) The acute standard (AS) is calculated using the following equation:
- 1909

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

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

- 1913
- 1914 2) The chronic standard (CS) is calculated using the following equations:
- 1915
- 1916 A) During the Early Life Stage Present period, as defined in
- 1917 subsection (f):

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

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

1921
1922
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1924

- ii) When water temperature is above 14.51 °C:

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

1925
1926
1927
1928

where:

~~T = Water Temperature, degrees Celsius~~

T = Water Temperature, degrees Celsius

1929
1930

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

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1932
1933
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1937

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

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

1938
1939
1940
1941

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

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

1942
1943
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1945

Where:

~~T = Water Temperature, degrees Celsius~~

1946
1947

POLLUTION CONTROL BOARDNOTICE OF PROPOSED AMENDMENTST = Water Temperature, degrees Celsius

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- 3) The sub-chronic standard is equal to 2.5 times the chronic standard.
- d) Attainment of the Total Ammonia Nitrogen Water Quality Standards:
- 1) The acute standard for total ammonia nitrogen (in mg/L) must not be exceeded at any time except in those waters for which the Agency has approved a ZID under 35 Ill. Adm. ~~Code pursuant to Section Code~~ 302.102 ~~of this Part~~.
- 2) The 30-day average concentration of total ammonia nitrogen (in mg/L) must not exceed the chronic standard (CS) except in those waters in which mixing is allowed under 35 Ill. Adm. ~~Code pursuant to Section Code~~ 302.102 ~~of this Part~~. Attainment of the chronic standard (CS) is determined in ~~compliance accordance~~ compliance with subsection (e) ~~of this Section~~ by averaging at least four samples collected at weekly intervals or at other sampling intervals that statistically represent a 30-day sampling period. The samples must be collected in a manner that assures a representative sampling period.
- 3) The 4-day average concentration of total ammonia nitrogen (in mg/L) must not exceed the sub-chronic standard ~~is~~ except in those waters in which mixing is allowed under 35 Ill. Adm. ~~Code pursuant to Section Code~~ 302.102 ~~of this Part~~. Attainment of the sub-chronic standard is determined in ~~compliance accordance~~ compliance with subsection (e) by averaging daily sample results collected over a period of four consecutive days within the 30-day averaging period. The samples must be collected in a manner that assures a representative sampling period.
- e) The water quality standard for each water body must be calculated based on the temperature and pH of the water body measured at the time of each ammonia sample. The concentration of total ammonia in each sample must be divided by the calculated water quality standard for the sample to determine a quotient. The water quality standard is attained if the mean of the sample quotients is less than or equal to one for the duration of the averaging period.

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1984 f) The Early Life Stage Present period occurs from March through October. All
1985 other periods are subject to the Early Life Stage Absent period, except that waters
1986 listed in 35 Ill. Adm. Code 303.240 are not subject to Early Life Stage Present
1987 ammonia limits at any time.
1988

1989 BOARD NOTE: Acute and chronic standard concentrations for total ammonia nitrogen
1990 (in mg/L) for different combinations of pH and temperature are shown in Appendix C.
1991

1992 (Source: Amended at 46 Ill. Reg. _____, effective _____)
1993

1994 SUBPART E: LAKE MICHIGAN BASIN WATER QUALITY STANDARDS
1995

1996 **Section 302.501 Scope, Applicability, and Definitions**
1997

1998 a) Subpart E contains the Lake Michigan Basin water quality standards. These must
1999 be met in the waters of the Lake Michigan Basin as designated in 35 Ill. Adm.
2000 Code 303.443.
2001

2002 b) In addition to the definitions provided at 35 Ill. Adm. Code 301.200 through
2003 301.444, and in place of conflicting definitions at 35 Ill. Adm. ~~CodeSectionCode~~
2004 302.100, the following terms have the meanings specified for the Lake Michigan
2005 Basin:

2006 ~~“~~
2007

2008 ~~“~~Acceptable daily exposure”~~”~~ or ~~“~~ADE”~~”~~ means an estimate of the
2009 maximum daily dose of a substance that is not expected to result in
2010 adverse noncancer effects to the general human population, including
2011 sensitive subgroups.
2012

2013 ~~“~~Acceptable endpoints”~~”~~, for the purpose of deriving wildlife criteria
2014 ~~derivation~~, means acceptable subchronic and chronic endpoints that affect
2015 reproductive or developmental success, organismal viability or growth, or
2016 any other endpoint that is, or is directly related to, parameters that
2017 influence population dynamics.
2018

2019
2020 ~~“~~Acute to chronic ratio”~~”~~ or ~~“~~ACR”~~”~~ is the standard measure of the
2021 acute toxicity of a material divided by an appropriate measure of the

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2022 chronic toxicity of the same material under comparable conditions.

2023

2024 "Acute toxicity" means adverse effects that result from an exposure
2025 period that is a small portion of the life span of the organism.

2026

2027 "Adverse effect" means any deleterious effect to organisms due to
2028 exposure to a substance. This includes effects that are or may become
2029 debilitating, harmful or toxic to the normal functions of the organism, but
2030 does not include non-harmful effects such as tissue discoloration alone or
2031 the induction of enzymes involved in the metabolism of the substance.

2032

2033 "Baseline BAF" for organic chemicals, means a BAF that is based on
2034 the concentration of freely dissolved chemical in the ambient water and
2035 takes into account the partitioning of the chemical within the organism; for
2036 inorganic chemicals, a BAF is based on the wet weight of the tissue.

2037

2038 "Baseline BCF" for organic chemicals, means a BCF that is based on the
2039 concentration of freely dissolved chemical in the ambient water and takes
2040 into account the partitioning of the chemical within the organism; for
2041 inorganic chemicals, a BAF is based on the wet weight of the tissue.

2042

2043

2044 "Bioaccumulative chemical of concern" or "BCC" is any chemical
2045 that has the potential to cause adverse effects and that, upon entering the
2046 surface waters, by itself or as its toxic transformation product,
2047 accumulates in aquatic organisms by a human health bioaccumulation
2048 factor greater than 1,000, after considering metabolism and other
2049 physiochemical properties that might enhance or inhibit bioaccumulation,
2050 in ~~compliance~~accordance~~compliance~~ with the methodology in 35 Ill. Adm.
2051 ~~Code~~Section~~Code~~ 302.570. In addition, the half life of the chemical in the
2052 water column, sediment or biota must be greater than eight weeks. BCCs
2053 include, ~~but are not limited to,~~ the following substances:

2054

2055

Chlordane

2056

2057 4,4'-DDD; p,p'-DDD; 4,4'-TDE; p,p'-TDE

2058

2059 4,4'-DDE; p,p'-DDE

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2060	
2061	4,4'-DDT; p,p'-DDT
2062	
2063	Dieldrin
2064	
2065	Hexachlorobenzene
2066	
2067	Hexachlorobutadiene; Hexachloro-1,3-butadiene
2068	
2069	Hexachlorocyclohexanes; BHCs
2070	
2071	alpha- Hexachlorocyclohexane; alpha-BHC
2072	
2073	beta- Hexachlorocyclohexane; beta-BHC
2074	
2075	delta- Hexachlorocyclohexane; delta-BHC
2076	
2077	Lindane; gamma- Hexachlorocyclohexane; gamma-BHC
2078	
2079	Mercury
2080	
2081	Mirex
2082	
2083	Octachlorostyrene
2084	
2085	PCBs; polychlorinated biphenyls
2086	
2087	Pentachlorobenzene
2088	
2089	Photomirex
2090	
2091	2,3,7,8-TCDD; Dioxin
2092	
2093	1,2,3,4-Tetrachlorobenzene
2094	
2095	1,2,4,5-Tetrachlorobenzene
2096	
2097	Toxaphene

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"~~Bioaccumulation~~"²² is the net accumulation of a substance by an organism as a result of uptake from all environmental sources.

"~~Bioaccumulation factor~~"²² or "~~BAF~~"²² 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~~"²² 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~~"²² or "~~BCF~~"²² 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~~"²² or "~~BSAF~~"²² 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~~"²² 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.~~

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2136 "Chronic effect" means an adverse effect that is measured by assessing
2137 an acceptable endpoint, and results from continual exposure over several
2138 generations, or at least over a significant part of the test species' projected
2139 life span or life stage.

2141 "Chronic toxicity" means adverse effects that result from an exposure
2142 period that is a large portion of the life span of the organism.

2144
2145 "Dissolved organic carbon" or "DOC" means organic carbon that
2146 passes through a 1 μm pore size filter.

2147
2148 "Dissolved metal" means the concentration of a metal that will pass
2149 through a 0.45 μm pore size filter.

2150
2151 "Food chain" means the energy stored by plants is passed along through
2152 the ecosystem through trophic levels in a series of steps of eating and
2153 being eaten, also known as a food web.

2154
2155 "Food chain multiplier" or "FCM" means the ratio of a BAF to an
2156 appropriate BCF.

2157
2158 "Linearized multi-stage model" means a mathematical model for cancer
2159 risk assessment. This model fits linear dose-response curves to low doses.
2160 It is consistent with a no-threshold model of carcinogenesis.

2161
2162
2163 "Lowest observed adverse effect level" or "LOAEL" means the lowest
2164 tested dose or concentration of a substance that results in an observed
2165 adverse effect in exposed test organisms when all higher doses or
2166 concentrations result in the same or more severe effects.

2167
2168 "No observed adverse effect level" or "NOAEL" means the highest
2169 tested dose or concentration of a substance that results in no observed
2170 adverse effect in exposed test organisms where higher doses or
2171 concentrations result in an adverse effect.

2172
2173 "Octanol water partition coefficient" or "Kow" is the ratio of the

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2174 concentration of a substance in the n-octanol phase to its concentration in
2175 the aqueous phase in an equilibrated two-phase octanol water system. For
2176 log Kow, the log of the octanol water partition coefficient is a base 10
2177 logarithm.
2178

2179 "Open Waters of Lake Michigan" means all of the waters within Lake
2180 Michigan in Illinois jurisdiction lakeward from a line drawn across the
2181 mouth of tributaries to Lake Michigan, but not including waters enclosed
2182 by constructed breakwaters.
2183

2184 "Particulate organic carbon" or "POC" means organic carbon that is
2185 retained by a 1 ~~mm~~µm pore size filter.
2186

2187 "Relative source contribution" or "RSC" means the percent of total
2188 exposure that can be attributed to surface water through water intake and
2189 fish consumption.
2190

2191 "Resident or indigenous species" means species that currently live a
2192 substantial portion of their life cycle, or reproduce, in a given body of
2193 water, or that are native species whose historical range includes a given
2194 body of water.
2195

2196 "Risk associated dose" or "RAD" means a dose of a known or
2197 presumed carcinogenic substance in mg/kg/day which, over a lifetime of
2198 exposure, is estimated to be associated with a plausible upper bound
2199 incremental cancer risk equal to one in 100,000.
2200

2201 "Slope factor" or " q_1^* " is the incremental rate of cancer development
2202 calculated through use of a linearized multistage model or other
2203 appropriate model. It is expressed in mg/kg/day of exposure to the
2204 chemical in question.
2205

2206 "Standard Methods" means "Standard Methods for the Examination of
2207 Water and Wastewater", available from the American Public Health
2208 Association.
2209

2210 "Subchronic effect" means an adverse effect, measured by assessing an
2211 acceptable endpoint, resulting from continual exposure for a period of

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2212 time less than that deemed necessary for a chronic test.
2213
2214 "“Target species”” is a species to be protected by the criterion.
2215
2216 "“Target species value”” is the criterion value for the target species.
2217
2218 "“Test species”” is a species that has test data available to derive a
2219 criterion.
2220
2221 "“Test dose”” or "“TD”” is a LOAEL or NOAEL for the test species.
2222
2223 "“Tier I criteria”” are numeric values derived by use of the Tier I
2224 methodologies that either have been adopted as numeric criteria into a
2225 water quality standard or are used to implement narrative water quality
2226 criteria.
2227
2228 "“Tier II values”” are numeric values derived by use of the Tier II
2229 methodologies that are used to implement narrative water quality criteria.
2230 They are applied as criteria, have the same effect, and subject to the same
2231 appeal rights as criteria.
2232
2233 "“Trophic level”” means a functional classification of taxa within a
2234 community that is based on feeding relationships. For example, aquatic
2235 green plants and herbivores comprise the first and second trophic levels in
2236 a food chain.
2237
2238 "“Toxic unit acute”” or "“ TU_a ”” is the reciprocal of the effluent
2239 concentration that causes 50 percent of the test organisms to die by the end
2240 of the acute exposure period, which is 48 hours for invertebrates and 96
2241 hours for vertebrates.
2242
2243 "“Toxic unit chronic”” or "“ TU_c ”” is the reciprocal of the effluent
2244 concentration that causes no observable effect on the test organisms by the
2245 end of the chronic exposure period, which is at least seven days for
2246 Ceriodaphnia, fathead minnow and rainbow trout.
2247
2248
2249 "“Uncertainty factor”” or "“UF”” is one of several numeric factors used in

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2250 deriving criteria from experimental data to account for the quality or
2251 quantity of the available data.

2252

2253 "~~USEPA~~" means United States Environmental Protection Agency.

2254

2255 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2256

2257 **Section 302.502 Dissolved Oxygen**

2258

2259 Dissolved oxygen (~~STORET number 00300~~) must not be less than 90% of saturation, except due
2260 to natural causes, in the Open Waters of Lake Michigan as defined at 35 Ill. Adm.

2261 ~~CodeSectionCode~~ 302.501. The other waters of the Lake Michigan Basin must not be less than
2262 6.0 mg/L during at least 16 hours of any 24 hour period, nor less than 5.0 mg/L at any time.

2263

2264 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2265

2266 **Section 302.503 pH**

2267

2268 pH (~~STORET number 00400~~) must be within the range of 7.0 to 9.0, except for natural causes, in
2269 the Open Waters of Lake Michigan as defined at 35 Ill. Adm. ~~CodeSectionCode~~ 302.501. Other
2270 waters of the Basin must be within the range of 6.5 to 9.0, except for natural causes.

2271

2272 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2273

2274 **Section 302.504 Chemical Constituents**

2275

2276 The following concentrations of chemical constituents must not be exceeded, except as provided
2277 in 35 Ill. Adm. ~~CodeSectionsCode~~ 302.102 and 302.530:

2278

- 2279 a) The following standards must be met in all waters of the Lake Michigan Basin.
2280 Acute aquatic life standards (AS) must not be exceeded at any time except for
2281 those waters for which the Agency has approved a zone of initial dilution (ZID)
2282 under 35 Ill. Adm. ~~Codepursuant to SectionsCode~~ 302.102 and 302.530. Chronic
2283 aquatic life standards (CS) and human health standards (HHS) must not be
2284 exceeded outside of waters in which mixing is allowed under 35 Ill. Adm.
2285 ~~Codepursuant to SectionsCode~~ 302.102 and 302.530 by the arithmetic average of
2286 at least four consecutive samples collected over a period of at least four days. The
2287 samples used to demonstrate compliance with the CS or HHS must be collected in

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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	$340 \times 1.0^* = 340$	$340 \times 1.0^* = 148$ $148 \times 1.0^* = 148$	NA
Boron (total)	mg/L	40.1	7.6	NA
Cadmium (dissolved)	µg/L	$\frac{\exp[A + B \ln(H)] \times \{1.138672 - [(\ln H)]\}}{\exp[A + B \ln(H)] \times \{1.138672 - [(\ln H)]\}}$ (0.041838)]} * where $A = -3.6867$ and $B = 1.128$	$\frac{\exp[A + B \ln(H)] \times \{1.101672 - [(\ln H)]\}}{\exp[A + B \ln(H)] \times \{1.101672 - [(\ln H)]\}}$ (0.041838)]} * where $A = -2.715$ and $B = 0.7852$	NA
Chromium (Hexavalent, total)	µg/L	16	11	NA
Chromium (Trivalent, dissolved)	µg/L	$\frac{\exp[A + B \ln(H)] \times \{0.316^*\}}{\exp[A + B \ln(H)] \times \{0.316^*\}}$ where $A = 3.7256$ and $B = 0.819$	$\frac{\exp[A + B \ln(H)] \times \{0.860^*\}}{\exp[A + B \ln(H)] \times \{0.860^*\}}$ where $A = 0.6848$ and $B = 0.819$	NA
Copper (dissolved)	µg/L	$\frac{\exp[A + B \ln(H)] \times \{0.960^*\}}{\exp[A + B \ln(H)] \times \{0.960^*\}}$ where $A = -1.700$ and $B = 0.9422$	$\frac{\exp[A + B \ln(H)] \times \{0.960^*\}}{\exp[A + B \ln(H)] \times \{0.960^*\}}$ where $A = -1.702$ and $B = 0.8545$	NA
Cyanide**	µg/L	22	5.2	NA
Fluoride (total)	µg/L	$\exp[A + B \ln(H)]$	$\exp[A + B \ln(H)]$	NA

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		$\exp[A + B \ln(H)]$	$\exp[A + B \ln(H)]$, but must shall must not exceed 4.0 mg/L	
		where $A = 6.7319$ and $B = 0.5394$	where $A = 6.0445$ and $B = 0.5394$	
Lead (dissolved)	µg/L	$\exp[A + B \ln(H)] \times$ $[1.46203 - \ln(H)]$ $\exp[A + B \ln(H)] \times$ $[1.46203 - \ln(H)]$ (0.145712)]} *	$\exp[A + B \ln(H)] \times$ $[1.46203 - \ln(H)]$ $\exp[A + B \ln(H)] \times$ $[1.46203 - \ln(H)]$ (0.145712)]} *	NA
		where $A = -1.055$ and $B = 1.273$	where $A = -4.003$ and $B = 1.273$	
Manganese (dissolved)	µg/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)	µg/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	$\exp[A + B \ln(H)] \times$ $\exp[A + B \ln(H)] \times$	$\exp[A + B \ln(H)] \times$ $\exp[A + B \ln(H)] \times$	NA

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		0.978*	0.986*	
		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

2290

where:

NA = Not Applied

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

$\ln(H)$ = natural logarithm of Hardness in mg/L as CaCO₃

* = conversion factor multiplier for dissolved metals

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** = standard to be evaluated using either of the following USEPA approved methods, incorporated by reference at 35 Ill. Adm. Code 301.106-~~302.510~~: Method OIA-1677, DW: Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry, January 2004, Document Number EPA-821-R-04-001 or Cyanide Amenable to Chlorination, Standard Methods 4500-CN-G (40 CFR 136.3).

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- 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~~.

<u>Constituent</u>		<u>Unit</u>	<u>Water Quality Standard</u>
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

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- 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.

<u>Constituent</u>		<u>Unit</u>	<u>Water Quality Standard</u>
Arsenic (total)		µg/L	50.0

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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

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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.

<u>Constituent</u>	<u>Unit</u>	<u>Water Quality Standard</u>
Benzene	µg/L	12.0
Chlorobenzene	µg/L	470.0

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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

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

<u>Constituent</u>	<u>Unit</u>	<u>AS</u>	<u>CS</u>	<u>HHS</u>	<u>WS</u>
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

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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

2322

2323 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2324

2325 **Section 302.505 Fecal Coliform**

2326

2327 Based on a minimum of five samples taken over not more than a 30-day period, fecal coliform
2328 ~~(STORET number 31616)~~ must not exceed a geometric mean of 20 per 100 ml in the Open
2329 Waters of Lake Michigan as defined in 35 Ill. Adm. ~~Code~~ Section Code 302.501. The remaining
2330 waters of the Lake Michigan Basin must not exceed a geometric mean of 200 per 100 ml, nor
2331 shall more than 10% of the samples during any 30 day period exceed 400 per 100 ml.

2332

2333 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2334

2335 **Section 302.506 Temperature**

2336

2337 ~~a) — STORET numbers for temperature are (°F) 00011 and (°C) 00010.~~

2338

2339 ~~a)~~ b) The owner or operator of a source of heated effluent ~~must~~ shall ~~must~~ maintain such
2340 records and conduct such studies of the effluents from ~~the~~ such ~~the~~ source and ~~it~~ of
2341 ~~their~~ its effects as may be required by the Agency or in any permit granted under
2342 the Act.

2343

2344 ~~b)~~ e) Backfitting of alternative cooling facilities will be required if, upon complaint
2345 filed in ~~compliance~~ ~~accordance~~ compliance with Board rules, it is found at any time
2346 that any heated effluent causes significant ecological damage to the Lake.

2347

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2348 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2349

2350 **Section 302.507 Thermal Standards for Existing Sources on January 1, 1971**

2351

2352 All sources of heated effluents in existence as of January 1, 1971, ~~must~~shall~~must~~ meet the
2353 following restrictions outside of a mixing zone which ~~must~~shall~~must~~ be no greater than a circle
2354 with a radius of 305 m (1000 feet) or an equal fixed area of simple form.

2355

2356 a) There ~~must~~shall be no abnormal temperature changes that may affect aquatic life.

2357

2358 b) The normal daily and seasonal temperature fluctuations that existed before the
2359 addition of heat ~~must~~shall be maintained.

2360

2361 c) The maximum temperature rise at any time above natural temperatures ~~must~~shall
2362 not exceed 1.7 °C (3 °F)~~1.7°C (3°F)~~. In addition, the water temperature ~~must~~ shall
2363 not exceed the maximum limits indicated in the following table:

2364

	<u>°C</u>	<u>°F</u>	<u>°C</u>	<u>°F</u>
JAN.	7	45	JUL.	27
FEB.	7	45	AUG.	27
MAR.	7	45	SEPT.	27
APR.	13	55	OCT.	18
MAY	16	60	NOV.	16
JUN.	21	70	DEC.	10

2372

	<u>°C</u>	<u>°F</u>	<u>°C</u>	<u>°F</u>
<u>JAN.</u>	<u>7</u>	<u>45</u>	<u>JUL.</u>	<u>27</u>
<u>FEB.</u>	<u>7</u>	<u>45</u>	<u>AUG.</u>	<u>27</u>
<u>MAR.</u>	<u>7</u>	<u>45</u>	<u>SEPT.</u>	<u>27</u>
<u>APR.</u>	<u>13</u>	<u>55</u>	<u>OCT.</u>	<u>18</u>
<u>MAY</u>	<u>16</u>	<u>60</u>	<u>NOV.</u>	<u>16</u>
<u>JUN.</u>	<u>21</u>	<u>70</u>	<u>DEC.</u>	<u>10</u>

2373

2374 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2375

2376 **Section 302.508 Thermal Standards for Sources Under Construction But Not In Operation**
2377 **on January 1, 1971**

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2378

2379 Any effluent source under construction but not in operation on January 1, 1971 must meet all the
2380 requirements of 35 Ill. Adm. ~~Code~~Section Code 302.507 and in addition must meet the following
2381 restrictions:

2382

2383 a) The ~~Neither the~~ bottom, the shore, the hypolimnion, and ~~nor~~ the thermocline must
2384 not ~~shall~~ be affected by any heated effluent.

2385

2386 b) Heated ~~No heated~~ effluent must not ~~shall~~ affect spawning grounds or fish
2387 migration routes.

2388

2389 c) Discharge structures must ~~shall~~ be ~~so~~ designed ~~as~~ to maximize short-term mixing
2390 and thus to reduce the area significantly raised in temperature.

2391

2392 d) Discharge ~~No discharge~~ must not ~~shall~~ exceed ambient temperatures by more than
2393 11 °C (20 °F) ~~1°C (20°F)~~.

2394

2395 e) Heated effluents from more than one source must ~~shall~~ not interact.

2396

2397 f) All reasonable steps must ~~shall~~ be taken to reduce the number of organisms drawn
2398 into or against the intakes.

2399

2400 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2401

2402 Section 302.509 Other Sources

2403

2404 a) A ~~No~~ source of heated effluent which was not in operation or under construction
2405 as of January 1, 1971, must not ~~shall~~ discharge more than a daily average of 29
2406 megawatts (0.1 billion British thermal units per hour).

2407

2408 b) Sources of heated effluents which discharge less than a daily average of 29
2409 megawatts (0.1 billion British ~~Thermal Units~~thermal units per hour) not in
2410 operation or under construction as of January 1, 1971, must ~~shall~~ meet all
2411 requirements of 35 Ill. Adm. ~~Codes~~sections Code 302.507 and 302.508.

2412

2413 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2414

2415 Section 302.510 Incorporations by Reference (Repealed)

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

~~American Public Health Association et al., Standard Methods for the Examination of Water and Wastewater, 21st Edition, 2005. Available from the American Public Health Association, 800 I Street, NW, Washington, D.C. 20001-3710, (202)777-2742.~~

~~USEPA. United States Environmental Protection Agency, Office of Health and Environmental Assessment, Washington, D.C. 20460, Method OIA-1677, DW: Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry, January 2004, Document Number EPA-821-R-04-001.~~

~~b) The Board incorporates the following federal regulations by reference. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, (202) 783-3238:~~

~~40 CFR 136 (1996)~~

~~40 CFR 141 (1988)~~

~~40 CFR 302.4 (1988)~~

~~The Sections of 40 CFR 132 (1996) listed below:~~

~~Appendix A~~

~~Section I A~~

~~Section II~~

~~Section III C~~

~~Section IV D, E, F, G, H, and I~~

~~Section V C~~

~~Section VI A, B, C, D, E, and F~~

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2454

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~~Section VIII~~

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~~Section XI~~

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~~Section XVII~~

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~~Appendix B~~

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~~Section III~~

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~~Section VII B and C~~

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2467

~~Section VIII~~

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2469

~~Appendix C~~

2470

2471

~~Section II~~

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~~Section III A (1 through 6 and 8), B (1 and 2)~~

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2475

~~Appendix D~~

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~~Section III C, D, and E~~

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~~Section IV~~

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2481

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

2482

2483

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

2484

2485 Section 302.515 Offensive Conditions

2486

2487 Waters of the Lake Michigan Basin must be free from sludge or bottom deposits, floating debris,

2488 visible oil, odor, plant or algal growth, color or turbidity of other than natural origin. The

2489 allowed mixing provisions of 35 Ill. Adm. ~~Code~~Section~~Code~~ 302.102 must ~~shall~~ not be used to

2490 comply with the provisions of this Section.

2491

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2492 (Source: Amended at 46 Ill. Reg. _____, effective _____)
2493

2494 **Section 302.520 Regulation and Designation of Bioaccumulative Chemicals of Concern**
2495 **(BCCs)**
2496

2497 a) For ~~the purposes of~~ regulating BCCs in ~~compliance~~~~accordance~~compliance with 35
2498 Ill. Adm. ~~Code Sections~~Code 302.521 and 302.530 ~~of this Part~~, the following
2499 chemicals must ~~shall~~ be considered as BCCs:

2500

2501 1) any chemical or class of chemicals listed as a BCC in 35 Ill. Adm.
2502 ~~Code Section~~Code 302.501; and

2503

2504 2) any chemical or class of chemicals that the Agency has determined meets
2505 the characteristics of a BCC as defined in 35 Ill. Adm. ~~Code Section~~Code
2506 302.501 as indicated by:

2507

2508 A) publication in the Illinois Register; or

2509

2510 B) notification to a permittee or applicant; or

2511

2512 C) filing a petition with the Board to verify that the chemical must
2513 ~~shall~~ be designated a BCC.

2514

2515 b) Notwithstanding subsections (a)(2)(A) and (B) ~~of this Section~~, a chemical must
2516 ~~shall~~ not be regulated as a BCC if the Agency has not filed a petition, within 60
2517 days after such publication or notification, with the Board in
2518 ~~compliance~~~~accordance~~compliance with Section 28.2 of the Act to verify that the
2519 chemical must ~~shall~~ be designated a BCC.

2520

2521 c) Under ~~Pursuant to~~ subsection (b) ~~of this Section~~ and 35 Ill. Adm.
2522 ~~Code Section~~Code 302.570 ~~of this Part~~, if the Board verifies that a chemical has a
2523 human health bioaccumulation factor greater than 1,000 and is consistent with the
2524 definition of a BCC in 35 Ill. Adm. Code 302.501 ~~Section 302.105~~, the Board
2525 must ~~shall~~ designate the chemical as a BCC and list the chemical in 35 Ill. Adm.
2526 ~~Code Section~~Code 302.501. If the Board fails to verify the chemical as a BCC in
2527 its final action on the verification petition, the chemical ~~must shall~~must not be
2528 listed as a BCC and ~~must shall~~must not be regulated as a BCC in
2529 ~~compliance~~~~accordance~~compliance with 35 Ill. Adm. ~~Code Sections~~Code 302.521

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2530 and 302.530 ~~of this Part.~~

2531

2532 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2533

2534 Section 302.521 Supplemental Antidegradation Provisions for BCCs

2535

2536 a) Notwithstanding the provisions of 35 Ill. Adm. ~~CodeSectionCode~~ 302.105, waters
2537 within the Lake Michigan Basin must not be lowered in quality due to new or
2538 increased loading of substances defined as ~~bioaccumulative chemicals of concern~~
2539 ~~(BCCs)~~ in 35 Ill. Adm. ~~CodeSectionCode~~ 302.501 from any source or activity
2540 subject to the NPDES permitting, Section 401 water quality certification
2541 provisions of the Clean Water Act (P.L. 92-100, as amended), or joint permits
2542 from the Agency and the Illinois Department of Natural Resources under Section
2543 39(n) of the Act [415 ILCS 5/39(n)] until and unless it can be affirmatively
2544 demonstrated that such change is necessary to accommodate important economic
2545 or social development.

2546

2547

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

2548

2549

2550

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

2551

2552

2553

2554

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

2555

2556

2557

2558

2559

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

2560

2561

2562

2563

2564

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

2565

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

- 4) Changes in loadings of any BCC within the existing capacity and processes of an existing NPDES authorized discharge, certified activity under ~~pursuant to~~ Section 401 of the Clean Water Act, or joint permits from the Agency and the Illinois Department of Natural Resources under Section 39(n) of the Act are not subject to the antidegradation review of subsection (a) ~~of this Section~~. These changes include ~~but are not limited to~~ ~~to~~:
 - A) normal operational variability, including, ~~but not limited to~~, intermittent increased discharges due to wet weather conditions;
 - B) changes in intake water pollutants;
 - C) increasing the production hours of the facility; or
 - D) increasing the rate of production.

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

- b) The following actions are not subject to the provisions of subsection (a) ~~of this Section~~, unless the Agency determines the circumstances of an individual situation warrant application of those provisions to adequately protect water quality:
 - 1) Short-term, temporary (i.e., weeks or months) lowering of water quality;
 - 2) Bypasses that are not prohibited at 40 CFR 122.41 (m), incorporated by

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2606 reference in 35 Ill. Adm. Code 301.106; or

2607

2608 3) Response actions ~~underpursuant to~~under the Comprehensive
2609 Environmental Response, Compensation and Liability Act (CERCLA), as
2610 amended, or similar federal or State authority, undertaken to alleviate a
2611 release into the environment of hazardous substances, pollutants or
2612 contaminants that pose danger to public health or welfare.

2613

2614 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2615

2616 **Section 302.525 Radioactivity**

2617

2618 Except as provided in 35 Ill. Adm. ~~CodeSectionCode~~ 302.102, all waters of the Lake Michigan
2619 Basin must meet the following concentrations:

2620

2621 a) Gross beta ~~(STORET number 03501)~~ concentrations must not exceed 100
2622 picocuries per liter (pCi/L).

2623

2624 ~~b)~~b) Strontium 90 ~~(STORET number 13501)~~ concentration must ~~shall~~ not exceed 2
2625 picocuries per liter (pCi/L).

2626

2627 c) The annual average radium 226 and 228 ~~(STORET number 11503)~~ combined
2628 concentration must not exceed 3.75 picocuries per liter (pCi/L).

2629

2630 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2631

2632 **Section 302.530 Supplemental Mixing Provisions for Bioaccumulative Chemicals of**

2633 **Concern (BCCs)**

2634

2635 The Allowed Mixing, Mixing Zones, and ZIDs ~~provisions~~General Provisions~~provisions~~ of 35 Ill.

2636 Adm. ~~CodeSectionCode~~ 302.102 ~~(Allowed Mixing, Mixing Zones and ZIDs)~~ apply within the

2637 Lake Michigan Basin except as otherwise provided ~~herein~~ for substances defined as BCCs in 35

2638 Ill. Adm. ~~CodeSectionCode~~ 302.501:

2639

2640 a) Mixing is ~~not~~No mixing shall be not allowed for BCCs for new discharges
2641 commencing on or after December 24, 1997.

2642

2643 b) Discharges of BCCs existing as of December 24, 1997 are eligible for mixing

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2644 allowance consistent with 35 Ill. Adm. ~~Code~~Section Code 302.102 until March 23,
2645 2007. After March 23, 2007 mixing for BCCs will not be allowed except as
2646 provided in subsections (c) and (d) ~~of this Section~~.

2647
2648 c) Mixing allowance for a source in existence on December 24, 1997 may continue
2649 beyond March 23, 2007 where it can be demonstrated on a case by case basis that
2650 continuation of mixing allowance is necessary to achieve water conservation
2651 measures that result in overall reduction of BCC mass loading to the Lake
2652 Michigan Basin.

2653
2654 d) Mixing allowance for a source in existence on December 24, 1997 ~~will~~shall~~will~~
2655 only continue if necessitated by technical and economic factors. Any mixing
2656 allowance continued beyond March 23, 2007 based on technical and economic
2657 factors ~~must~~shall~~must~~ be limited to not more than one NPDES permit term, and
2658 ~~must~~shall~~must~~ reflect the maximum achievable BCC loading reduction within the
2659 identified technical and economic considerations necessitating the exception.
2660 ~~The~~Such~~The~~ continued mixing allowance ~~must~~shall~~must~~ not be renewed beyond
2661 that permit term unless a new determination of technical and economic necessity
2662 is made.

2663
2664 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2665
2666 **Section 302.535 Ammonia Nitrogen**

2667

2668 The Open Waters of Lake Michigan as defined in 35 Ill. Adm. ~~Code~~Section Code 302.501 must
2669 not exceed 0.02 mg/L total ammonia ~~(as N: STORET Number 00610)~~. The remaining waters of
2670 the Lake Michigan Basin ~~are~~shall be subject to the following:

2671

2672 a) Total ammonia nitrogen ~~(as N: STORET Number 00610)~~ must in no case exceed
2673 15 mg/L.

2674

2675 b) Un-ionized ammonia nitrogen ~~(as N: STORET Number 00612)~~ must not exceed
2676 the acute and chronic standards given below subject to the provisions of 35 Ill.
2677 Adm. ~~Code~~Sections Code 302.208(a) and (b) ~~of this Part~~:

2678

2679 1) From April through October, the Acute Standard (AS) must ~~shall~~ be 0.33
2680 mg/L and the chronic standard (CS) must ~~shall~~ be 0.057 mg/L.

2681

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2682 2) From November through March, the AS ~~must~~shall~~must~~ be 0.14 mg/L and
2683 the CS ~~must~~shall~~must~~ be 0.025 mg/L.

2684
2685 c) For ~~purposes of~~ this Section, the concentration of un-ionized ammonia nitrogen as
2686 N and total ammonia as N must ~~shall~~ be computed according to the following
2687 equations:

2688
2689 ~~U =~~ ~~N~~
2690 ~~[0.94412(1 + 10^x) + 0.0559]~~

2691
2692
2693

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

2694
2695 and N = U[0.94412(1 + 10^x) + 0.0559]

2696
2697 Where: ~~X = 0.09018 +~~ ~~2729.92~~ ~~pH~~
2698 ~~(T + 273.16)~~

- 2699
2700 ~~U = Concentration of un-ionized ammonia as N in mg/L~~
2701 ~~N = Concentration of ammonia nitrogen as N in mg/L~~
2702 ~~T = Temperature in degrees Celsius.~~

2703

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

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.

2704
2705 (Source: Amended at 46 Ill. Reg. _____, effective _____)
2706

2707 **Section 302.540 Other Toxic Substances**

2708
2709 Waters of the Lake Michigan Basin must be free from any substance or any combination of
2710 substances in concentrations toxic or harmful to human health, or to animal, plant or aquatic life.
2711 The numeric standards protective of particular uses specified for individual chemical substances

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2712in 35 Ill. Adm. ~~CodeSection~~Code 302.504 are not subject to recalculation by this Section,
2713however, where no standard applies ~~to is applied for to~~ a category, a numeric value may be
2714calculated ~~herein~~.

2715

2716 a) Any substance ~~will~~shallwill be deemed toxic or harmful to aquatic life if present
2717 in concentrations that exceed the following:

2718

2719 1) A Tier I Lake Michigan Basin Acute Aquatic Life Toxicity Criterion
2720 (LMAATC) or Tier II Lake Michigan Basin Acute Aquatic Life Toxicity
2721 Value (LMAATV) derived ~~underpursuant to~~under procedures ~~set forth~~ in
2722 35 Ill. Adm. ~~CodeSections~~Code 302.555, 302.560 or 302.563 at any time;
2723 or

2724

2725 2) A Tier I Lake Michigan Basin Chronic Aquatic Life Toxicity Criterion
2726 (LMCATC) or Tier II Lake Michigan Basin Chronic Aquatic Life Toxicity
2727 Value (LMCATV) derived ~~underpursuant to~~under procedures ~~set forth~~ in
2728 35 Ill. Adm. ~~CodeSection~~Code 302.565 as an average of four samples
2729 collected on four different days.

2730

2731 b) Any combination of substances, including effluents, ~~will~~shallwill be deemed toxic
2732 to aquatic life if present in concentrations that exceed either subsection (b)(1) or
2733 (2) ~~of this Section~~:

2734

2735 1) A ~~No~~ sample of water from the Lake Michigan Basin collected outside of
2736 a designated zone of initial dilution must not ~~shall~~ exceed 0.3 TU_a as
2737 determined for the most sensitive species tested using acute toxicity
2738 testing methods.

2739

2740 2) A ~~No~~ sample of water from the Lake Michigan Basin collected outside a
2741 designated mixing zone must not ~~shall~~ exceed 1.0 TU_c as determined for
2742 the most sensitive species tested using chronic toxicity testing methods.

2743

2744 3) To demonstrate compliance with subsections (1) and (2) ~~of this subsection~~
2745 ~~(b)~~, at least two resident or indigenous species ~~mustwill~~must be tested.
2746 The rainbow trout ~~mustwill~~must be used to represent fishes for the Open
2747 Waters of Lake Michigan and the fathead minnow ~~mustwill~~must represent
2748 fishes for the other waters of the Lake Michigan Basin. Ceriodaphnia
2749 ~~mustwill~~must represent invertebrates for all waters of the Lake Michigan

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- 2750 Basin. Other common species ~~may~~shall~~may~~ be used if listed in Table I
2751 (a) ~~A~~ of 40 CFR 136, incorporated by reference at 35 Ill. Adm. Code
2752 301.106 ~~Section 302.510~~, and approved by the Agency.
2753
- 2754 c) Any substance ~~must~~shall be deemed toxic or harmful to wildlife if present in
2755 concentrations that exceed a Tier I Lake Michigan Basin Wildlife Criterion
2756 (LMWLC) derived ~~under~~pursuant to~~under~~ procedures ~~set forth~~ in 35 Ill. Adm.
2757 ~~Code~~Section~~Code~~ 302.575 as an arithmetic average of four samples collected
2758 over four different days.
- 2759
- 2760 d) For any substance that is a threat to human health through drinking water
2761 exposure only, the resulting criterion or value ~~must~~apply~~shall be applicable~~apply
2762 to only the Open Waters of Lake Michigan. For any substance that is determined
2763 to be a BCC, the resulting criterion ~~must~~shallmust apply in the entire Lake
2764 Michigan Basin. These substances ~~must~~shallmust be deemed toxic or harmful to
2765 human health if present in concentrations that exceed either of the following:
2766
- 2767 1) A Tier I Lake Michigan Basin Human Health Threshold Criterion
2768 (LMHHTC) or Tier II Lake Michigan Basin Human Health Threshold
2769 Value (LMHHTV) based on disease or functional impairment due to a
2770 physiological mechanism for which there is a threshold dose below which
2771 no damage occurs as derived ~~under~~pursuant to~~under~~ procedures ~~set forth~~
2772 in 35 Ill. Adm. ~~Code~~Section~~Code~~ 302.585 as an arithmetic average of four
2773 samples collected over four different days; or
2774
- 2775 2) A Tier I Lake Michigan Basin Human Health Nonthreshold Criterion
2776 (LMHHNC) or Tier II Lake Michigan Basin Human Health Nonthreshold
2777 Value (LMHHNV) based on disease or functional impairment due to a
2778 physiological mechanism for which any dose may cause some risk of
2779 damage as derived ~~under~~pursuant to~~under~~ procedures ~~set forth~~ in 35 Ill.
2780 Adm. ~~Code~~Section~~Code~~ 302.590 as an arithmetic average of four samples
2781 collected over four different days.
- 2782
- 2783 e) The derived criteria and values apply at all points outside of any waters in which
2784 mixing is allowed under 35 Ill. Adm. ~~Code~~pursuant to~~Section~~Code 302.102 or
2785 ~~Section~~ 302.530.
2786
- 2787 f) The procedures of this Subpart E set forth minimum data requirements,

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2788 appropriate test protocols and data assessment methods for establishing criteria or
2789 values ~~underpursuant to~~under subsections (b), (c), and (d) ~~of this Section~~. No
2790 other procedures may be used to establish such criteria or values unless approved
2791 by the Board in a rulemaking or adjusted standards proceeding ~~underpursuant~~
2792 ~~to~~under Title VII of the Act. The validity and applicability of these procedures
2793 may not be challenged in any proceeding brought ~~underpursuant to~~under Title
2794 VIII or X of the Act, although the validity and correctness of application of the
2795 numeric criteria or values derived under ~~pursuant to~~ this Subpart may be
2796 challenged in such proceedings ~~underpursuant to~~under subsection (g) ~~of this~~
2797 ~~Section~~.

2798
2799 g) Challenges to application of criteria and values.
2800

2801 1) A permittee may challenge the validity and correctness of application of a
2802 criterion or value derived by the Agency under ~~pursuant to~~ this Section
2803 only at the time such criterion or value is first applied in its NPDES permit
2804 under ~~pursuant to~~ 35 Ill. Adm. Code 309.152 or in an action ~~underpursuant~~
2805 ~~to~~under Title VIII of the Act for violation of the toxicity water quality
2806 standard. Failure of a person to challenge the validity of a criterion or
2807 value at the time of its first application to that person's facility constitutes
2808 ~~shall constitute~~ a waiver of a ~~such~~ challenge in any subsequent proceeding
2809 involving application of the criterion or value to that person.
2810

2811 2) Consistent with subsection (g)(1) ~~of this Section~~, if a criterion or value is
2812 included as, or is used to derive, a condition of an NPDES discharge
2813 permit, a permittee may challenge the criterion or value in a permit appeal
2814 ~~underpursuant to~~under 35 Ill. Adm. Code 309.181. ~~In any such action, the~~
2815 ~~Agency shall include in the record all information upon which it has relied~~
2816 ~~in developing and applying the criterion or value, and whether such~~
2817 ~~information was developed by the Agency or submitted by the petitioner.~~
2818 ~~THE BURDEN OF PROOF SHALL BE ON THE PETITIONER pursuant~~
2819 ~~to Section 40(a)(1) of the Act.~~

2820
2821 3) Consistent with subsection (g)(1) ~~of this Section~~, in an action where
2822 alleged violation of the toxicity water quality standard is based on alleged
2823 excursion of a criterion or value, the person bringing the ~~such~~ action
2824 ~~has~~shall havehas the burdens of going forward with proof and persuasion
2825 regarding the general validity and correctness of application of the

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2826 criterion or value.

2827

2828 h) Subsections (a) through (e) ~~of this Section~~ do not apply to USEPA registered
2829 pesticides approved for aquatic application and applied under ~~pursuant to~~ the
2830 following conditions:

2831

2832 1) Application must ~~shall~~ be made in strict ~~compliance~~~~accordance~~compliance
2833 with label directions;

2834

2835 2) Applicator must ~~shall~~ be properly certified under the provisions of the
2836 Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 135 et seq.
2837 (1972));

2838

2839 3) Applications of aquatic pesticides must ~~comply~~~~be in accordance~~comply
2840 with the laws, regulations and guidelines of all State and federal agencies
2841 authorized by law to regulate, use or supervise pesticide applications;

2842

2843 4) Aquatic ~~No aquatic~~ pesticide must not ~~shall~~ be applied to waters affecting
2844 public or food processing water supplies unless a permit to apply the
2845 pesticide has been obtained from the Agency. All permits must ~~shall~~ be
2846 issued so as not to cause a violation of the Act or of any of the Board's
2847 rules ~~or regulations~~. To aid applicators in determining their
2848 responsibilities under this subsection (h), a list of waters affecting public
2849 water supplies will be published and maintained by the Agency's Division
2850 of Public Water Supplies.

2851

2852 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2853

2854 **Section 302.545 Data Requirements**

2855

2856 The Agency ~~must~~~~shall~~must review, for validity, applicability and completeness the data used in
2857 calculating criteria or values. To the extent available, and to the extent not otherwise specified,
2858 testing procedures, selection of test species and other aspects of data acquisition must be
2859 according to methods published by USEPA or nationally recognized standards of organizations,
2860 including, ~~but not limited to~~, those methods found in Standard Methods, incorporated by
2861 reference in 35 Ill. Adm. Code 301.106 ~~Section 302.510~~, or recommended in 40 CFR 132, ~~and~~
2862 incorporated by reference in 35 Ill. Adm. Code 301.106 ~~Section 302.510~~.

2863

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2864 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2865

2866 **Section 302.550 Analytical Testing**

2867

2868 All methods of sample collection, preservation, and analysis used in applying any of the
2869 requirements of this Subpart must ~~shall~~ be consistent with the methods published by USEPA or
2870 nationally recognized standards of organizations, including ~~but not limited to~~ those methods
2871 found in Standard Methods, incorporated by reference in 35 Ill. Adm. Code 301.106 ~~Section~~
2872 ~~302.510~~, or recommended in 40 CFR 132 and incorporated by reference in 35 Ill. Adm. Code
2873 301.106 ~~Section 302.510~~.

2874

2875 (Source: Amended at 46 Ill. Reg. _____, effective _____)

2876

2877 **Section 302.553 Determining the Lake Michigan Aquatic Toxicity Criteria or Values** ~~=~~

2878 **General Procedures**

2879

2880 The Lake Michigan Aquatic Life Criteria and Values are those concentrations or levels of a
2881 substance at which aquatic life is protected from adverse effects resulting from short or long term
2882 exposure in water.

2883

2884 a) Tier I criteria and Tier II values to protect against acute effects in aquatic
2885 organisms will be calculated according to procedures listed at 35 Ill. Adm.
2886 ~~Code Sections Code~~ 302.555, 302.560 and 302.563. The procedures of 35 Ill.
2887 Adm. ~~Code Section Code~~ 302.560 ~~must shall~~ must be used as necessary to allow for
2888 interactions with other water quality characteristics such as hardness, pH,
2889 temperature, etc. Tier I criteria and Tier II values to protect against chronic
2890 effects in aquatic organisms ~~must shall~~ must be calculated according to the
2891 procedures listed at 35 Ill. Adm. ~~Code Section Code~~ 302.565.

2892

2893 b) Minimum data requirements. In order to derive a Tier I acute or chronic criterion,
2894 data must be available for at least one species of freshwater animal in at least
2895 eight different families such that the following taxa are included:

2896

2897 1) The family Salmonidae in the class Osteichthyes;

2898

2899 2) One other family in the class Osteichthyes;

2900

2901 3) A third family in the phylum Chordata;

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2902

2903

- 4) A planktonic crustacean;

2904

2905

- 5) A benthic crustacean;

2906

2907

- 6) An insect;

2908

2909

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

2910

2911

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

2912

2913

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

2914

2915

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

2916

2917

2918

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2920

2921

2922

2923

2924

2925

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

2926

2927

2928

2929

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

2930

2931 Section 302.555 Determining the Tier I Lake Michigan Acute Aquatic Toxicity Criterion

2932(LMAATC): Independent of Water Chemistry

2933

2934 If the acute toxicity of the chemical has not been shown to be related to a water quality

2935 characteristic, including, ~~but not limited to,~~ hardness, pH, or temperature, the Tier I LMAATC is

2936 calculated using the procedures below.

2937

2938

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

2939

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- 2940 values from all tests.
 2941
 2942 b) For each genus for which one or more SMAVs are available, the Genus Mean
 2943 Acute Value (GMAV) is calculated as the geometric mean of the SMAVs
 2944 available for the genus.
 2945
 2946 c) The GMAVs are ordered from high to low in numerical order.
 2947
 2948 d) Ranks (R) are assigned to the GMAVs from "1" for the lowest to "N" for the
 2949 highest. If two or more GMAVs are identical, successive ranks are arbitrarily
 2950 assigned.
 2951
 2952 e) The cumulative probability, P, is calculated for each GMAV as R/(N+1).
 2953
 2954 f) The GMAVs to be used in the calculations of subsection (g) ~~of this Section~~ must
 2955 be those with cumulative probabilities closest to 0.05. If there are fewer than 59
 2956 GMAVs in the total data set, the values utilized must be the lowest four obtained
 2957 through the ranking procedures of subsections (c) and (d) ~~of this Section~~.
 2958
 2959 g) Using the GMAVs identified under ~~pursuant to~~ subsection (f) ~~of this Section~~ and
 2960 the Ps calculated under ~~pursuant to~~ subsection (e) ~~of this Section~~, the Final Acute
 2961 Value (FAV) and the LMAATC are calculated as:

$$\begin{aligned} \text{FAV} &= \exp(A) \text{ and} \\ \text{LMAATC} &= \text{FAV}/2 \end{aligned}$$

Where:

$$A = L + 0.2236 S$$

$$L = [\sum(\ln \text{GMAV}) - S(\sum(P^{0.5}))]/4$$

$$S = \frac{[\sum((\ln \text{GMAV})^2) - ((\sum(\ln \text{GMAV}))^2)/4]}{[\sum(P) - ((\sum(P^{0.5}))^2)/4]}^{0.5}$$

$$\begin{aligned} \underline{A} &= \underline{L + 0.2236 S} \\ \underline{L} &= \underline{[\sum(\ln \text{GMAV}) - S(\sum(P^{0.5}))]/4} \\ \underline{S} &= \underline{[\sum((\ln \text{GMAV})^2) - ((\sum(\ln \text{GMAV}))^2)/4] / [\sum(P) - ((\sum(P^{0.5}))^2)/4]}^{0.5} \end{aligned}$$

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

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

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2981 Section 302.560 Determining the Tier I Lake Michigan Basin Acute Aquatic Life Toxicity
2982 Criterion (LMAATC): Dependent on Water Chemistry

2983

2984 If data are available to show that a relationship exists between a water quality characteristic
2985 (WQC) and acute toxicity to two or more species, a Tier I LMAATC must be calculated using
2986 procedures in this Section. Although the relationship between hardness and acute toxicity is
2987 typically non-linear, it can be linearized by a logarithmic transformation (i.e., for any variable, K,
2988 $f(K) = \text{logarithm of } K$) of the variables and plotting the logarithm of hardness against the
2989 logarithm of acute toxicity. Similarly, relationships between acute toxicity and other water
2990 quality characteristics, such as pH or temperature, may require a transformation, including no
2991 transformation (i.e., for any variable, K, $f(K) = K$) for one or both variables to obtain least
2992 squares linear regression of the transformed acute toxicity values on the transformed values of
2993 the water quality characteristic. An LMAATC is calculated using the following procedures.

2994

2995

- a) For each species for which acute toxicity values are available at two or more different values of the water quality characteristic, a linear least squares regression of the transformed acute toxicity (TAT) values on the transformed water quality characteristic (TWQC) values is performed to obtain the slope of the line describing the relationship.

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

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- c) Normalize the TAT values for each species by subtracting W, the arithmetic mean

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3012 of the TAT values of a species, from each of the TAT values used in the
3013 determination of the mean, such that the arithmetic mean of the normalized TAT
3014 values for each species individually or for any combination of species is zero
3015 (0.0).
3016

3017 d) Normalize the TWQC values for each species using X, the arithmetic mean of the
3018 TWQC values of a species, in the same manner as in subsection (c) ~~of this~~
3019 ~~Section.~~
3020

3021 e) Group all the normalized data by treating them as if they were from a single
3022 species and perform a least squares linear regression of all the normalized TAT
3023 values on the corresponding normalized TWQC values to obtain the pooled acute
3024 slope, V.
3025

3026 f) For each species, the graphical intercept representing the species TAT intercept,
3027 f(Y), at a specific selected value, Z, of the WQC is calculated using the equation:
3028

$$3029 \quad f(Y) = W - V(X \underline{=} g(Z))$$

3030
3031 Where:

3032
3033 ~~f() is the transformation used to convert acute toxicity values to TAT values~~

3034
3035 ~~Y is the species acute toxicity intercept or species acute intercept~~

3036
3037 ~~W is the arithmetic mean of the TAT values as specified in subsection (c) of this~~
3038 ~~Section~~

3039
3040 ~~V is the pooled acute slope as specified in subsection (e) of this Section~~

3041
3042 ~~X is the arithmetic mean of the TWQC values as specified in subsection (c) of~~
3043 ~~this Section~~

3044
3045 ~~g() is the transformation used to convert the WQC values to TWQC values~~

3046
3047 ~~Z is a selected value of the WQC~~
3048

f() is the transformation used to convert acute toxicity values to TAT

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

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- g) For each species, determine the species acute intercept, Y, by carrying out an inverse transformation of the species TAT value, f(Y). For example, in the case of a logarithmic transformation, Y = antilogarithm of (f(Y)); or in the case where no transformation is used, Y = f(Y).
- h) The Final Acute Intercept (FAI) is derived by using the species acute intercepts, obtained from subsection (f) ~~of this Section~~, in ~~compliance~~ ~~accordance~~ ~~compliance~~ with the procedures described in 35 Ill. Adm. ~~Code~~ ~~Section~~ ~~Code~~ 302.555 (b) through (g), with the word "value" replaced by the word "intercept". Note that in this procedure geometric means and natural logarithms are always used.
- i) The Aquatic Acute Intercept (AAI) is obtained by dividing the FAI by two. If, for a commercially or recreationally important species, the geometric mean of the acute values at Z is lower than the FAV at Z, then the geometric mean of that species must be used as the FAV.
- j) The LMAATC at any value of the WQC, denoted by WQCx, is calculated using the terms defined in subsection (f) ~~of this Section~~ and the equation:

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

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

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

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3076 If all eight minimum data requirements for calculating a FAV using Tier I procedures are not
 3077 met, a Tier II LMAATV must be calculated for a substance as follows:

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

Number of Minimum data requirements satisfied (required taxa)	Secondary Acute Factor
1	43.8
2	26.0
3	16.0
4	14.0
5	12.2
6	10.4
7	8.6

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

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

3092 **Section 302.565 Determining the Lake Michigan Basin Chronic Aquatic Life Toxicity**

3093 **Criterion (LMCATC) or the Lake Michigan Basin Chronic Aquatic Life Toxicity Value**

3094 **(LMCATV)**

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- 3096 a) Determining Tier I LMCATC
3097
3098 1) When chronic toxicity data are available for at least eight resident or
3099 indigenous species from eight different North American genera of
3100 freshwater organisms as specified in 35 Ill. Adm. ~~CodeSectionCode~~
3101 302.553, a Tier I LMCATC is derived in the same manner as the FAV in
3102 35 Ill. Adm. ~~CodeSectionCode~~ 302.555 or 302.560 by substituting
3103 LMCATC for FAV or FAI, chronic for acute, SMCV (Species Mean
3104 Chronic Value) for SMAV, and GMCV (Genus Mean Chronic Value) for
3105 GMAV.
3106
3107 2) If data are not available to meet the requirements of subsection (a) ~~of this~~
3108 ~~Section~~, a Tier I LMCATC is calculated by dividing the FAV by the
3109 geometric mean of the acute-chronic ratios (ACRs) obtained from at least
3110 one species of aquatic animal from at least three different families
3111 provided that of the three species:
3112
3113 A) At least one is a fish;
3114
3115 B) At least one is an invertebrate; and
3116
3117 C) At least one species is an acutely sensitive freshwater species if the
3118 other two are saltwater species.
3119
3120 3) The acute-chronic ratio (ACR) for a species equals the acute toxicity
3121 concentration from data considered under 35 Ill. Adm. ~~CodeSectionCode~~
3122 302.555 or 302.560, divided by the chronic toxicity concentration.
3123
3124 4) If a resident or indigenous species whose presence is necessary to sustain
3125 commercial or recreational activities will not be protected by the
3126 calculated LMCATC, then the SMCV for that species is used as the
3127 CATC.
3128
3129 b) Determining the Tier II LMCATV
3130
3131 1) If all eight minimum data requirements for calculating a FCV using Tier I
3132 procedures are not met, or if there are not enough data for all three ACRs,
3133 a Tier II Lake Michigan Chronic Aquatic Life Toxicity Value

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3134 ~~must~~shall~~must~~ be calculated using a secondary acute chronic ratio (SACR)
3135 determined as follows:

3136
3137 A) If fewer than three valid experimentally determined ACRs are
3138 available:

3139
3140 i) Use sufficient ACRs of 18 so that the total number of
3141 ACRs equals three; and

3142
3143 ii) Calculate the Secondary Acute-Chronic Ratio as the
3144 geometric mean of the three ACRs; or

3145
3146 B) If no experimentally determined ACRs are available, the SACR is
3147 18.

3148
3149 2) Calculate the Tier II LMCATV using one of the following equations:

3150
3151 A) Tier II LMCATV = FAV / SACR

3152
3153 B) Tier II LMCATV = SAV / FACR

3154
3155 C) Tier II LMCATV = SAV / SACR

3156
3157 Where:

3158
3159 the SAV equals 2 times the value of the Tier II LMAATV
3160 calculated in 35 Ill. Adm. ~~Code~~Section~~Code~~ 302.563

3161
3162 3) If, for a commercially or recreationally important species, the SMCV is
3163 lower than the calculated Tier II LMCATV, then the SMCV must be used
3164 as the Tier II LMCATV.

3165
3166 (Source: Amended at 46 Ill. Reg. _____, effective _____)

3167
3168 **Section 302.570 Procedures for Deriving Bioaccumulation Factors for the Lake Michigan**
3169 **Basin**

3170
3171 A bioaccumulation factor (BAF) is used to relate the concentration of a substance in an aquatic

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3172organism to the concentration of the substance in the waters in which the organism resides when
3173all routes of exposure (ambient water and food) are included. A BAF is used in the derivation of
3174water quality criteria to protect wildlife and criteria and values to protect human health.

3175

3176 a) Selection of data. BAFs can be obtained or developed from one of the following
3177 methods, listed in order of preference.

3178

3179 1) Field-measured BAF.

3180

3181 2) Field-measured biota-sediment accumulation factor (BSAF).

3182

3183 3) Laboratory-measured bioconcentration factor (BCF).

3184 The concentration of particulate organic carbon (POC) and dissolved

3185 organic carbon (DOC) in the test solution must ~~shall~~ be either measured or
3186 reliably estimated.

3187

3188 4) Predicted BCF.

3189

Predicted baseline BCF = K_{ow} .

3191

3192 b) Calculation of baseline BAFs for organic chemicals.

3193 The most preferred BAF or BCF from above is used to calculate a baseline BAF
3194 which in turn is utilized to derive a human health or wildlife specific BAF.

3195

3196 1) Procedures for determining the necessary elements of baseline calculation.

3197

3198 A) Lipid normalization. The lipid-normalized concentration, C_{t_l} , of a
3199 chemical in tissue is defined using the following equation:

3200

$$3201 C_{t_l} = C_b / f_{t_l}$$

3202

3203 Where:

3204

3205 ~~C_b = concentration of the organic chemical in the tissue of aquatic
3206 biota (either whole organism or specified tissue) ($\mu\text{g/g}$)~~

3207

~~f_{t_l} = fraction of the tissue that is lipid~~

3208

C_b = concentration of the organic chemical in the tissue of

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

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

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

Where:

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

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

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- C) Food Chain Multiplier (FCM). For an organic chemical, the FCM used must ~~shall~~ be taken from Table B-1 in Appendix B of 40 CFR 132, ~~Appendix B (1996)~~ incorporated by reference at 35 Ill. Adm. Code 301.106 ~~Section 302.510~~.

- 2) Calculation of baseline BAFs.

- A) From field-measured BAFs:

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

Where:

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

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

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

$$(Baseline\ BAF)_i = (baseline\ BAF)_r (BSAF)_i (Kow)_i / (BSAF)_r (Kow)_r$$

Where:

~~(BSAF)_i = BSAF for chemical "i"~~
~~(BSAF)_r = BSAF for the reference chemical "r"~~
~~(Kow)_i = octanol-water partition coefficient for chemical "i"~~
~~(Kow)_r = octanol-water partition coefficient for the reference chemical "r"~~

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

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

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

Where:

~~C_{t} = the lipid-normalized concentration of the chemical in tissue~~

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

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

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

$$C_{\text{soc}} = C_{\text{s}} / f_{\text{oc}}$$

Where:

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

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

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- C) From a laboratory-measured BCF:

$$\text{baseline BAF} = (\text{FCM}) \{ [\text{measured BCF}_{\text{tT}} / f_{\text{td}}] - 1 \} \{ 1 / f_{\text{t}} \}$$

Where:

~~BCF_{tT} = BCF based on total concentration in tissue and water.~~
 ~~f_{t} = fraction of the tissue that is lipid~~

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~~f_{fd} = fraction of the total chemical in the test water that is freely dissolved~~
~~FCM = the food-chain multiplier obtained from Table B-1 in Appendix B of 40 CFR 132, Appendix B, incorporated by reference at 35 Ill. Adm. Code 310.106 Section 302.510, by linear interpolation for trophic level 3 or 4, as necessary~~

BCF_{T} = BCF based on total concentration in tissue and water.
 f_l = fraction of the tissue that is lipid
 f_{fd} = fraction of the total chemical in the test water that is freely dissolved
FCM = the food-chain multiplier obtained from Table B-1 in Appendix B of 40 CFR 132, incorporated by reference at 35 Ill. Adm. Code 301.106, by linear interpolation for trophic level 3 or 4, as necessary

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D) From a predicted BCF:

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

Where:

~~FCM = the food-chain multiplier obtained from Table B-1 in Appendix B of 40 CFR 132, Appendix 5, incorporated by reference at 35 Ill. Adm. Code 301.106 Section 302.510, by linear interpolation for trophic level 3 or 4, as necessary~~
~~Kow = octanol-water partition coefficient~~

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

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c) Human health and wildlife BAFs for organic chemicals:

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3317 1) Fraction freely dissolved (f_{fd}). By using the equation in subsection
3318 (b)(1)(B) ~~of this Section~~, the f_{fd} to be used to calculate human health and
3319 wildlife BAFs for an organic chemical must ~~shall~~ be calculated using a
3320 standard POC concentration of 0.00000004 kg/L and a standard DOC
3321 concentration of 0.000002 kg/L:

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

3322
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3324
3325 2) Human health BAF. The human health BAFs for an organic chemical
3326 must ~~shall~~ be calculated using the following equations:

3327
3328 A) For trophic level 3:

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

3331
3332 B) For trophic level 4:

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

3333
3334
3335 Where:

3336
3337
3338 0.0182 and 0.0310 are the standardized fraction lipid values
3339 for trophic levels 3 and 4, respectively, that are used to
3340 derive human health criteria and values

3341
3342 3) Wildlife BAF. The wildlife BAFs for an organic chemical must ~~shall~~ be
3343 calculated using the following equations:

3344
3345 A) For trophic level 3:

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

3348
3349 B) For trophic level 4:

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

3351
3352 Where:
3353
3354

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3355 0.0646 and 0.1031 are the standardized fraction lipid values
3356 for trophic levels 3 and 4, respectively, that are used to
3357 derive wildlife criteria
3358

3359 d) Human health and wildlife BAFs for inorganic chemicals. For inorganic
3360 chemicals the baseline BAFs for trophic levels 3 and 4 are both assumed to equal
3361 the BCF determined for the chemical with fish.
3362

3363 1) Human health. Measured BAFs and BCFs used to determine human
3364 health BAFs for inorganic chemicals must ~~shall~~ be based on concentration
3365 in edible tissue (e.g., muscle) of freshwater fish.
3366

3367 2) Wildlife. Measured BAFs and BCFs used to determine wildlife BAFs for
3368 inorganic chemicals must ~~shall~~ be based on concentration in the whole
3369 body of freshwater fish and invertebrates.
3370

3371 (Source: Amended at 46 Ill. Reg. _____, effective _____)
3372

3373 **Section 302.575 Procedures for Deriving Tier I Water Quality Criteria and Values in the**
3374 **Lake Michigan Basin to Protect Wildlife**
3375

3376 The Lake Michigan Basin Wildlife Criterion (LMWC) is the concentration of a substance which
3377 if not exceeded protects Illinois wild mammal and bird populations from adverse effects
3378 resulting from ingestion of surface waters of the Lake Michigan Basin and from ingestion of
3379 aquatic prey organisms taken from surface waters of the Lake Michigan Basin. Wildlife criteria
3380 calculated under this Section protect against long-term effects and are therefore considered
3381 chronic criteria. The methodology involves utilization of data from test animals to derive criteria
3382 to protect representative or target species: bald eagle, herring gull, belted kingfisher, mink and
3383 river otter. The lower of the geometric mean of species specific criteria for bird species or
3384 mammal species is chosen as the LMWC to protect a broad range of species.
3385

3386 a) This method must ~~shall~~ also be used for non-BCCs when appropriately modified
3387 to consider the following factors:
3388

3389 1) Selection of scientifically justified target species;
3390

3391 2) Relevant routes of chemical exposure;
3392

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- 3393 3) Pertinent toxicity endpoints.
3394
3395 b) Minimum data requirements:
3396
3397 1) Test dose (TD). In order to calculate a LMWC the following minimal data
3398 base is required:
3399
3400 A) There must be at least one data set showing dose-response for oral,
3401 subchronic, or chronic exposure of 28 days for one bird species;
3402 and
3403
3404 B) There must be at least one data set showing dose-response for oral,
3405 subchronic, or chronic exposure of 90 days for one mammal
3406 species.
3407
3408 2) Bioaccumulation Factor (BAF) data requirements:
3409
3410 A) For any chemical with a BAF of less than 125 the BAF may be
3411 obtained by any method; and
3412
3413 B) For chemicals with a BAF of greater than 125 the BAF must come
3414 from a field measured BAF or Biota-Sediment Accumulation
3415 Factor (BSAF).
3416
3417 c) Principles for development of criteria
3418
3419 1) Dose standardization. The data for the test species must be expressed as,
3420 or converted to, the form mg/kg/d utilizing the guidelines for drinking and
3421 feeding rates and other procedures in 40 CFR 132, incorporated by
3422 reference in 35 Ill. Adm. Code 301.106 ~~at Section 302.510~~.
3423
3424 2) Uncertainty factors (UF) for utilizing test dose data in the calculation of
3425 the target species value (TSV);
3426
3427 A) Correction for intermittent exposure. If the animals used in a study
3428 were not exposed to the toxicant each day of the test period, the no
3429 observed adverse effect level (NOAEL) must be multiplied by the
3430 ratio of days of exposure to the total days in the test period.

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B) Correction from the lowest observed adverse effect level (LOAEL) to NOAEL (UF_{L1}). For those substances for which a LOAEL has been derived, the UF_{L1} ~~must~~shall~~must~~ not be less than one and should not exceed 10.

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

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

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

$$TSV = \left\{ \frac{[TD \times Wt]}{[UF_a \times UF_s \times UF_{L1}]} \right\} / \left\{ W + \frac{\sum [F_{TLi} \sum [F_{TLi} \times BAF_{WLTLi}]]}{W} \right\}$$

~~Where:~~

~~TSV = target species value in milligrams of substance per liter (mg/L).~~

~~TD = test dose that is toxic to the test species, either NOAEL or LOAEL.~~

~~UF_a = the uncertainty factor for extrapolating toxicity data across species (unitless). A species specific UF_a ~~must~~shall be selected and applied to each target species, consistent with the equation.~~

~~UF_s = the uncertainty factor for extrapolating from subchronic to chronic exposures (unitless).~~

~~UF_{L1} = the uncertainty factor for extrapolation from LOAEL to NOAEL (unitless)~~

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W_t = average weight in kilograms (kg) of the target species.

W = average daily volume of water in liters consumed per day (L/d) by the target species.

F_{TLi} = average daily amount of food consumed by the target species in kilograms (kg/d) for trophic level i .

BAF_{WLTLi} = aquatic life bioaccumulation factor with units of liter per kilogram (L/kg), as derived from 35 Ill. Adm. Code Section 302.570 for trophic level i .

e) —

Where:

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

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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

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3485 calculated and also of all bird species. The LMWC is the lower of the bird or
3486 mammal geometric mean TSV.

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3488 (Source: Amended at 46 Ill. Reg. _____, effective _____)

3489

3490 **Section 302.580 Procedures for Deriving Water Quality Criteria and Values in the Lake**
3491 **Michigan Basin to Protect Human Health - General**

3492

3493 a) The Lake Michigan Basin human health criteria or values for a substance are
3494 those concentrations at which humans are protected from adverse effects resulting
3495 from incidental exposure to, or ingestion of, the waters of Lake Michigan and
3496 from ingestion of aquatic organisms taken from the waters of Lake Michigan. A
3497 Lake Michigan Human Health Threshold Criterion (LMHHTC) or Lake Michigan
3498 Human Health Threshold Value (LMHHTV) will be calculated for all substances
3499 according to 35 Ill. Adm. [CodeSectionCode](#) 302.585, if data is available. Water
3500 quality criteria or values for substances which are, or may be, carcinogenic to
3501 humans will also be calculated according to procedures for the Lake Michigan
3502 Human Health Nonthreshold Criterion (LMHHNC) or the Lake Michigan Human
3503 Health Nonthreshold Value (LMHHNV) in 35 Ill. Adm. [CodeSectionCode](#)
3504 302.590.

3505

3506 b) Minimum data requirements for BAFs for Lake Michigan Basin human health
3507 criteria:

3508

3509 1) Tier I.

3510

3511 A) For all organic chemicals, either a field-measured BAF or a BAF
3512 derived using the BSAF methodology is required unless the
3513 chemical has a BAF less than 125, then a BAF derived by any
3514 methodology is required; and

3515

3516 B) For all inorganic chemicals, including organometals such as
3517 mercury, either a field-measured BAF or a laboratory-measured
3518 BCF is required.

3519

3520 2) Tier II. Any bioaccumulation factor method in 35 Ill. Adm.

3521 [CodeSectionCode](#) 302.570(a) may be used to derive a Tier II criterion.

3522

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3523 (Source: Amended at 46 Ill. Reg. _____, effective _____)
3524

3525 **Section 302.585 Procedures for Determining the Lake Michigan Basin Human Health**
3526 **Threshold Criterion (LMHHTC) and the Lake Michigan Basin Human Health Threshold**
3527 **Value (LMHHTV)**

3528
3529 The LMHHTC or LMHHTV is derived for all toxic substances from the most sensitive end point
3530 for which there exists a dosage or concentration below which no adverse effect or response is
3531 likely to occur.

3532

3533 a) Minimum data requirements:

3534

3535 1) Tier I. The minimum data set sufficient to derive a Tier I LMHHTC
3536 ~~must~~shall~~must~~ include at least one epidemiological study or one animal
3537 study of greater than 90 days duration; or

3538

3539 2) Tier II. When the minimum data for deriving Tier I criteria are not
3540 available, a more limited database consisting of an animal study of greater
3541 than 28 days duration ~~must~~shall~~must~~ be used.

3542

3543 b) Principles for development of Tier I criteria and Tier II values:

3544

3545 1) The experimental exposure level representing the highest level tested at
3546 which no adverse effects were demonstrated (NOAEL) ~~must~~shall~~must~~ be
3547 used for calculation of a criterion or value. In the absence of a NOAEL, a
3548 LOAEL ~~must~~shall~~must~~ be used if it is based on relatively mild and
3549 reversible effects;

3550

3551 2) Uncertainty factors (UFs) ~~must~~shall be used to account for the
3552 uncertainties in predicting acceptable dose levels for the general human
3553 population based upon experimental animal data or limited human data:

3554

3555 A) A UF of 10 ~~must~~shall be used when extrapolating from
3556 experimental results of studies on prolonged exposure to average
3557 healthy humans;

3558

3559 B) A UF of 100 ~~must~~shall be used when extrapolating from results of
3560 long-term studies on experimental animals;

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- C) A UF of up to 1000 must ~~shall~~ be used when extrapolating from animal studies for which the exposure duration is less than chronic, but greater than subchronic;
 - D) A UF of up to 3000 must ~~shall~~ be used when extrapolating from animal studies for which the exposure duration is less than subchronic;
 - E) An additional UF of between one and ten must ~~shall~~ be used when deriving a criterion from a LOAEL. The level of additional uncertainty applied ~~will~~~~shall~~~~will~~ depend upon the severity and the incidence of the observed adverse effect;
 - F) An additional UF of between one and ten must ~~shall~~ be applied when there are limited effects data or incomplete sub-acute or chronic toxicity data;
- 3) The total uncertainty (~~∑~~ of the uncertainty factors) must ~~shall~~ not exceed 10,000 for Tier I criterion and 30,000 for Tier II value; and
- 4) All study results must ~~shall~~ be converted to the standard unit for acceptable daily exposure of milligrams of toxicant per kilogram of body weight per day (mg/kg/day). Doses must ~~shall~~ be adjusted for continuous exposure.
- c) Tier I criteria and Tier II value derivation.
- 1) Determining the Acceptable Daily Exposure (ADE)
$$\text{ADE} = \text{test value} / \sum \text{ of the UFs from subsection (b)(2) of this Section}$$

Where:

acceptable daily exposure is in milligrams toxicant per kilogram body weight per day (mg/kg/day)
 - 2) Determining the Lake Michigan Basin Human Health Threshold Criterion

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3599 (LMHHTC) or the Lake Michigan Basin Human Health Threshold Value
3600 (LMHHTV)

3601
3602 LMHHTC or LMHHTV =

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3604
$$\{ ADE \times BW \times RSC \} /$$

3605
3606
$$\{ WC + [(FC_{TL3} \times BAF_{HHTL3}) + (FC_{TL4} \times BAF_{HHTL4})] \}$$

3607

3608 Where:

3609
3610 ~~LMHHTC or LMHHTV is in milligrams per liter (mg/L)~~

3611
3612 ~~ADE = acceptable daily intake in milligrams toxicant per kilogram body~~
3613 ~~weight per day (mg/kg/day)~~

3614
3615 ~~RSC = relative source contribution factor of 0.8~~

3616
3617 ~~BW = weight of an average human (BW = 70 kg)~~

3618
3619 ~~WC = per capita water consumption (both drinking and incidental~~
3620 ~~exposure) for surface waters classified as public water supplies = two~~
3621 ~~liters/day; or per capita incidental daily water ingestion for surface waters~~
3622 ~~not used as human drinking water sources = 0.01 liters/day~~

3623
3624 ~~FC_{TL3} = mean consumption of trophic level 3 fish by regional sport fishers~~
3625 ~~of regionally caught freshwater fish = 0.0036 kg/day~~

3626
3627 ~~FC_{TL4} = mean consumption of trophic level 4 fish by regional sport fishers~~
3628 ~~of regionally caught freshwater fish = 0.0114 kg/day~~

3629
3630 ~~BAF_{HHTL3} = human health bioaccumulation factor for edible portion of~~
3631 ~~trophic level 3 fish, as derived using the BAF methodology in 35 Ill. Adm.~~
3632 ~~Code Section 302.570~~

3633
3634 ~~BAF_{HHTL4} = human health bioaccumulation factor for edible portion of~~
3635 ~~trophic level 4 fish, as derived using the BAF methodology in 35 Ill. Adm.~~
3636 ~~Code Section 302.570~~

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<u>LMHHTC or LMHHTV is in milligrams per liter (mg/L)</u>	
<u>ADE</u>	= <u>acceptable daily intake in milligrams toxicant per kilogram body weight per day (mg/kg/day)</u>
<u>RSC</u>	= <u>relative source contribution factor of 0.8</u>
<u>BW</u>	= <u>weight of an average human (BW = 70 kg)</u>
<u>WC</u>	= <u>per capita water consumption (both drinking and incidental exposure) for surface waters classified as public water supplies = two liters/day; or per capita incidental daily water ingestion for surface waters not used as human drinking water sources = 0.01 liters/day</u>
<u>FC_{TL3}</u>	= <u>mean consumption of trophic level 3 fish by regional sport fishers of regionally caught freshwater fish = 0.0036 kg/day</u>
<u>FC_{TL4}</u>	= <u>mean consumption of trophic level 4 fish by regional sport fishers of regionally caught freshwater fish = 0.0114 kg/day</u>
<u>BAF_{HHTL3}</u>	= <u>human health bioaccumulation factor for edible portion of trophic level 3 fish, as derived using the BAF methodology in 35 Ill. Adm. Code 302.570</u>
<u>BAF_{HHTL4}</u>	= <u>human health bioaccumulation factor for edible portion of trophic level 4 fish, as derived using the BAF methodology in 35 Ill. Adm. Code 302.570</u>

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3639 (Source: Amended at 46 Ill. Reg. _____, effective _____)

3640

3641 Section 302.590 Procedures for Determining the Lake Michigan Basin Human Health

3642 Nonthreshold Criterion (LMHHNC) or the Lake Michigan Basin Human Health

3643 Nonthreshold Value (LMHHNV)

3644

3645 A LMHHNC or LMHHNV must ~~shall~~ be derived for those toxic substances for which any
3646 exposure, regardless of extent, carries some risk of damage from cancer or a nonthreshold toxic
3647 mechanism. For single or combinations of substances, a risk level of 1 in 100,000 (or 10⁻⁵) must
3648 ~~shall~~ be used for the purpose of determination of a LMHHNC or LMHHNV.

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- a) Minimum data requirements. Minimal experimental or epidemiological data requirements are incorporated in the cancer classification determined by USEPA at Appendix C II A to 40 CFR 132, incorporated by reference at 35 Ill. Adm. Code 301.106 ~~Section 302.510~~.
- b) Principles for development of criteria or values:
 - 1) Animal data are fitted to a linearized multistage computer model (Global 1986 in ~~"Mutagenicity and Carcinogenicity Assessment for 1, 3-Butadiene"~~ September 1985 EPA/600/8-85/004A, incorporated by reference at 35 Ill. Adm. ~~CodeSectionCode~~ 301.106 or scientifically justified equivalents). The upper-bound 95 percent confidence limit on risk at the 1 in 100,000 risk level ~~mustshall~~ must be used to calculate a risk associated dose (RAD); and
 - 2) A species scaling factor ~~mustshall~~ 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 ~~mustshall~~ be calculated using the following equation:

$$RAD = 0.00001 / q_1^*$$

Where:

~~RAD = risk associated dose in milligrams of toxicant or combinations of toxicants per kilogram body weight per day (mg/kg/day)~~
~~0.00001 (1 X 10⁻⁵) = incremental risk of developing cancer equal to 1 in 100,000~~

~~q₁^{*} = slope factor (mg/kg/day)⁻¹~~

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<u>RAD</u>	=	<u>risk associated dose in milligrams of toxicant or combinations of toxicants per kilogram body weight per day (mg/kg/day)</u>
<u>0.00001 (1 X 10⁻⁵)</u>	=	<u>incremental risk of developing cancer equal to 1 in 100,000</u>
<u>q₁*</u>	=	<u>slope factor (mg/kg/day)⁻¹</u>
<u>RAD</u>	=	<u>risk associated dose in milligrams of toxicant or combinations of toxicants per kilogram body weight per day (mg/kg/day)</u>
<u>0.00001 (1 X 10⁻⁵)</u>	=	<u>incremental risk of developing cancer equal to 1 in 100,000</u>
<u>q₁*</u>	=	<u>slope factor (mg/kg/day)⁻¹</u>

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

$$\text{LMHHNC or LMHHNV} =$$

$$\{ \text{RAD} \times \text{BW} \} / \{ \text{WC} + [(\text{FC}_{\text{TL3}} \times \text{BAF}_{\text{HHTL3}}) + (\text{FC}_{\text{TL4}} \times \text{BAF}_{\text{HHTL4}})] \}$$

Where:

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

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

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

~~WC = per capita water consumption for surface waters classified as public water supplies = 2 liters/day, or per capita incidental daily water ingestion for surface waters not used as human drinking water sources = 0.01 liters/day~~

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

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

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

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

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

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

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

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

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

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

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

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

- a) The Agency must ~~shall~~ maintain a listing of toxicity criteria and values derived ~~underpursuant to~~ under this Subpart. This list must ~~shall~~ be made available to the public and updated whenever a new criterion or value is derived and must ~~shall~~ be

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3725 published when updated in the Illinois Register.

3726

3727 b) A criterion or value published ~~underpursuant to~~under subsection (a) ~~of this~~
3728 ~~Section~~ may be proposed to the Board for adoption as a numeric water quality
3729 standard.

3730

3731 c) The Agency must ~~shall~~ maintain for inspection all information including, ~~but not~~
3732 ~~limited to~~, assumptions, toxicity data and calculations used in the derivation of
3733 any toxicity criterion or value listed pursuant to subsection (a) ~~of this Section~~ until
3734 adopted by the Board as a numeric water quality standard.

3735

3736 (Source: Amended at 46 Ill. Reg. _____, effective _____)

3737

3738 SUBPART F: PROCEDURES FOR DETERMINING WATER QUALITY CRITERIA

3739

3740 **Section 302.601 Scope and Applicability**

3741

3742 This Subpart contains the procedures for determining the water quality criteria ~~set forth~~ in 35 Ill.

3743 Adm. ~~Code Sections~~Code 302.210(a), (b) and (c) and 302.410(a), (b) and (c).

3744

3745 (Source: Amended at 46 Ill. Reg. _____, effective _____)

3746

3747 **Section 302.603 Definitions**

3748

3749 As used in this Subpart, the following terms ~~shall~~ have the meanings specified.

3750

3751 "Bioconcentration" means an increase in concentration of a chemical and its
3752 metabolites in an organism (or its specified tissues ~~thereof~~) relative to the
3753 concentration of the chemical in the ambient water acquired through contact with
3754 the water alone.

3755

3756

3757 "Carcinogen" means a chemical which causes an increased incidence of benign or
3758 malignant neoplasms, or a statistically significant decrease in the latency period
3759 between exposure and onset of neoplasms in at least one mammalian species or
3760 man through epidemiological or clinical studies.

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3763 "EC-50" means the concentration of a substance or effluent which causes a given
3764 effect to 50% of the exposed organisms in a given time period.

3765

3766

3767 "LC-50" means the concentration of a toxic substance or effluent which is lethal
3768 to 50% of the exposed organisms in a given time period.

3769

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3771 "LOAEL" or "Lowest Observable Adverse Effect Level" means the lowest tested
3772 concentration of a chemical or substance which produces a statistically significant
3773 increase in frequency or severity of non-overt adverse effects between the
3774 exposed population and its appropriate control.

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3777 "MATC" or "Maximum Acceptable Toxicant Concentration" means the value
3778 obtained by calculating the geometric mean of the lower and upper chronic limits
3779 from a chronic test. A lower chronic limit is the highest tested concentration
3780 which did not cause the occurrence of a specified adverse effect. An upper
3781 chronic limit is the lowest tested concentration which did cause the occurrence of
3782 a specified adverse effect and above which all tested concentrations caused such
3783 an occurrence.

3784

3785

3786 "NOAEL" or "No Observable Adverse Effect Level" means the highest tested
3787 concentration of a chemical or substance which does not produce a statistically
3788 significant increase in frequency or severity of non-overt adverse effects between
3789 the exposed population and its appropriate control.

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3791

3792 "Resident or Indigenous Species" means species which currently live a substantial
3793 portion of their lifecycle or reproduce in a given body of water, or which are
3794 native species whose historical range includes a given body of water.

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3797 (Source: Amended at 46 Ill. Reg. _____, effective _____)

3798

3799 **Section 302.604 Mathematical Abbreviations**

3800

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3801 This Subpart uses ~~the~~The~~the~~ following mathematical abbreviations ~~have been used in this~~
3802 ~~Subpart:~~

3803

3804 ~~exp x~~ ~~base of the natural logarithm, e, raised to x power~~

3805 ~~ln x~~ ~~natural logarithm of x~~

3806 ~~log x~~ ~~logarithm to the base 10 of x~~

3807 ~~A**B~~ ~~A raised to the B power~~

3808 ~~SUM(x)~~ ~~summation of the values of x~~

3809

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

3810

3811 (Source: Amended at 46 Ill. Reg. _____, effective _____)

3812

3813 **Section 302.606 Data Requirements**

3814

3815 The Agency must ~~shall~~ review, for validity, applicability and completeness, data used in
3816 calculating criteria. To the extent available, and to the extent not otherwise specified, testing
3817 procedures, selection of test species and other aspects of data acquisition must be according to
3818 methods published by USEPA or nationally recognized standards organizations, including ~~but~~
3819 ~~not limited to those~~ methods found in "Standard Methods", ~~as~~ incorporated by reference in 35 Ill.
3820 Adm. Code 301.106, ~~or approved by the American Society for Testing and Materials as~~
3821 ~~incorporated by reference in 35 Ill. Adm. Code 301.106.~~

3822

3823 (Source: Amended at 46 Ill. Reg. _____, effective _____)

3824

3825 **Section 302.612 Determining the Acute Aquatic Toxicity Criterion for an Individual**

3826 **Substance - General Procedures**

3827

3828 a) A chemical specific Acute Aquatic Toxicity Criterion (AATC) is calculated using
3829 procedures specified in 35 Ill. Adm. ~~Code Sections~~Code 302.615 and
3830 ~~302.618~~~~302.681~~302.618 if acute toxicity data are available for at least five ~~(5)~~
3831 resident or indigenous species from five ~~(5)~~ different North American genera of
3832 freshwater organisms including representatives of the following taxa:

3833

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- 3834 1) Representatives of two families in the Class Osteichthyes (Bony Fishes).
3835
3836 2) The family Daphnidae.
3837
3838 3) A benthic aquatic macroinvertebrate.
3839
3840 4) A vascular aquatic plant or a third family in the Phylum Chordata which
3841 may be from the Class Osteichthyes.
3842
3843 b) If data are not available for resident or indigenous species, data for non-resident
3844 species may be used if the non-resident species is of the same family or genus and
3845 has a similar habitat and environmental tolerance. The procedures of 35 Ill. Adm.
3846 [CodeSectionCode](#) 302.615 must be used to obtain an AATC for individual
3847 substances whose toxicity is unaffected by ambient water quality characteristics.
3848 The procedures of 35 Ill. Adm. [CodeSectionCode](#) 302.618 must be used if the
3849 toxicity of a substance is dependent upon some other water quality characteristic.
3850
3851 c) If data are not available that meet the requirements of subsection (a), an AATC is
3852 calculated by obtaining at least one EC-50 or LC-50 value from both a daphnid
3853 species and either fathead minnow or bluegill. If there are data available for any
3854 other North American freshwater species, they must also be included. An AATC
3855 is calculated by dividing the lowest Species Mean Acute Value (SMAV), as
3856 determined according to 35 Ill. Adm. [CodeSectionCode](#) 302.615, by 10.
3857
3858 (Source: Amended at 46 Ill. Reg. _____, effective _____)
3859

**3860 Section 302.615 Determining the Acute Aquatic Toxicity Criterion — Toxicity Independent
3861 of Water Chemistry**

3862

3863 If the acute toxicity of the chemical has not been shown to be related to a water quality
3864 characteristic, including ~~but not limited to~~, hardness, pH, temperature, etc., the AATC is
3865 calculated by using the procedures below.

3866

- 3867 a) For each species for which more than one acute value is available, the Species
3868 Mean Acute Value (SMAV) is calculated as the geometric mean of the acute
3869 values from all tests.
3870
3871 b) For each genus for which one or more SMAVs are available, the Genus Mean

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- 3872 Acute Value (GMAV) is calculated as the geometric mean of the SMAVs
3873 available for the genus.
3874
- 3875 c) The GMAVs are ordered from high to low.
3876
- 3877 d) Ranks (R) are assigned to the GMAVs from "H" for the lowest to "N" for the
3878 highest. If two or more GMAVs are identical, successive ranks are arbitrarily
3879 assigned.
3880
- 3881 e) The cumulative probability, P, is calculated for each GMAV as $R/(N + H)$.
3882
- 3883 f) The GMAVs to be used in the calculations of subsection (g) must be those with
3884 cumulative probabilities closest to 0.05. If there are less than 59 GMAVs in the
3885 total data set, the values utilized must be the lowest obtained through the ranking
3886 procedures of subsections (c) and (d). "T" is the number of GMAV's which are to
3887 be used in the calculations of subsection (g). T is equal to 4 when the data set
3888 includes at least one representative from each of the five taxa in 35 Ill. Adm.
3889 CodeSectionCode 302.612 and a representative from each of the three taxa listed
3890 below. T is equal to 3 when the data includes at least one representative from
3891 each of the five taxa in 35 Ill. Adm. CodeSectionCode 302.612 and from one or
3892 two of the taxa listed below. T is equal to 2 when the data set meets the minimum
3893 requirements of 35 Ill. Adm. CodeSectionCode 302.612 but does not include
3894 representatives from any of the three taxa listed below. When toxicity data on any
3895 of the three taxa listed below are available, they must be used along with the
3896 minimum data required pursuant to 35 Ill. Adm. CodeSectionCode 302.612.
3897
- 3898 1) A benthic crustacean, unless onesuchone was used under pursuant to 35
3899 Ill. Adm. CodeSectionCode 302.612(a)(3), in which case an insect must
3900 be usedutilizedused.
3901
- 3902 2) A member of a phylum not used in subsections (a), (b) or (f)(1).
3903
- 3904 3) An insect from an order not already represented.
3905
- 3906 g) Using the GMAVs and T-value identified under pursuant to subsection (f) and the
3907 Ps calculated underpursuant to under subsection (e), the Final Acute Value (FAV)
3908 and the AATC are calculated as:
3909

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

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

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Where:

~~A = L + 0.2236 S;~~

~~L = [SUM(1n GMAV) - S(SUM(P**0.5))]/T; and~~

~~S = [[SUM((1n GMAV)**2) - ((SUM(1n GMAV))**2)/T]/[SUM(P) - ((SUM(P**0.5))**2)/T]]**0.5.~~

A = L + 0.2236 S;
L = [SUM(1n GMAV) - S(SUM(P**0.5))]/T; and
S = [[SUM((1n GMAV)**2) - ((SUM(1n GMAV))**2)/T]/[SUM(P) - ((SUM(P**0.5))**2)/T]]**0.5

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- h) If a resident or indigenous species, whose presence is necessary to sustain commercial or recreational activities, or prevent disruptions of the waterbody's ecosystem, including ~~but not limited to~~ loss of species diversity or a shift to a biotic community dominated by pollution-tolerant species, will not be protected by the calculated FAV, then the EC-50 or LC-50 for that species is used as the FAV.

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

**3933 Section 302.618 Determining the Acute Aquatic Toxicity Criterion - Toxicity Dependent
3934 on Water Chemistry**

3935

3936 If data are available to show that a relationship exists between a water quality characteristic
3937 (WQC) and acute toxicity to two or more species, an Acute Aquatic Toxicity Criterion (AATC)
3938 may be calculated. The best documented relationship is that between the water quality
3939 characteristic, hardness and acute toxicity of metals. Although this relationship between
3940 hardness and acute toxicity is typically non-linear, it can be linearized by a logarithmic

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3941transformation (i.e. for any variable, K , $f(K) = \log_{10}(K)$) of the variables and plotting the
3942logarithm of hardness against the logarithm of acute toxicity. Similarly, relationships between
3943acute toxicity and other water quality characteristics, such as pH or temperature, may require a
3944transformation, including no transformation (i.e. for any variable, K , $f(K) = K$) for one or both
3945variables to obtain least squares linear regression of the transformed acute toxicity values on the
3946transformed values of the water quality characteristic. An AATC is calculated using the
3947following procedures:

3948

3949 a) For each species for which acute toxicity values are available at two or more
3950 different values of the water quality characteristic, a linear least squares
3951 regression of the transformed acute toxicity (TAT) values on the transformed
3952 water quality characteristic (TWQC) values is performed to obtain the slope of the
3953 line describing the relationship.

3954

3955 b) Each of the slopes determined pursuant to subsection (a) is evaluated as to
3956 whether or not it is statistically valid, taking into account the range and number of
3957 tested values of the water quality characteristic and the degree of agreement
3958 within and between species. If slopes are not available for at least one fish and
3959 one invertebrate species, or if the available slopes are too dissimilar, or if too few
3960 data are available to define the relationship between acute toxicity and the water
3961 quality characteristic, then the AATC must be calculated using the procedures in
3962 35 Ill. Adm. [CodeSectionCode](#) 302.615.

3963

3964 c) Normalize the TAT values for each species by subtracting W , the arithmetic mean
3965 of the TAT values of a species from each of the TAT values used in the
3966 determination of the mean, such that the arithmetic mean of the normalized TAT
3967 values for each species individually or for any combination of species is zero
3968 (0.0).

3969

3970 d) Normalize the TWQC values for each species using X , the arithmetic mean of the
3971 TWQC values of a species, in the same manner as in subsection (c).

3972

3973 e) Group all the normalized data by treating them as if they were from a single
3974 species and perform at least squares linear regression of all the normalized TAT
3975 values on the corresponding normalized TWQC values to obtain the pooled acute
3976 slope, V .

3977

3978 f) For each species, the graphical intercept representing the species TAT intercept,

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3979 f(Y), at a specific selected value, Z, of the WQC is calculated using the equation:

3980

3981

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

3982

3983

Where:

3984

3985

f () is the transformation used to convert acute toxicity values to TAT values;

3986

3987

3988

Y is the species acute toxicity intercept or species acute intercept;

3989

3990

W is the arithmetic mean of the TAT values as specified in subsection (c);

3991

3992

3993

V is the pooled acute slope as specified in subsection (e);

3994

3995

X is the arithmetic mean of the TWQC values as specified in subsection (d);

3996

3997

3998

g () is the transformation used to convert the WQC values to TWQC values; and

3999

4000

4001

Z is a selected value of the WQC.

4002

4003

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

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- h) The Final Acute Intercept (FAI) is derived by using the species acute intercepts, obtained from subsection (g), in ~~compliance~~~~accordance~~compliance with the procedures described in 35 Ill. Adm. ~~Code~~~~Section~~~~Code~~ 302.615(b) through (g), with the word "value" replaced by the word "intercept". Note that in this procedure geometric means and natural logarithms are always used.

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4014

- i) The Aquatic Acute Intercept (AAI) is obtained by dividing the FAI by two.

4015

4016

- j) The AATC at any value of the WQC, denoted by WQCx, is calculated using the

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4017 terms defined in subsection (f) and the equation:

4018

4019 $AATC = \exp[V (g(WQCx) - g(Z)) + f(AAI)]$.

4020

4021 (Source: Amended at 46 Ill. Reg. _____, effective _____)

4022

4023 **Section 302.621 Determining the Acute Aquatic Toxicity Criterion - Procedure for**

4024 **Combinations of Substances**

4025

4026 An AATC for any combination of substances (including effluent mixtures) must be determined

4027 by the following toxicity testing procedures:

4028

4029 a) Not more than 50% of test organisms from the most ~~sensitive~~~~entitive~~sensitive

4030 species tested may exhibit mortality or immobility after a 48-hour test for

4031 invertebrate or a 96-hour test for fishes.

4032

4033 b) Three resident or indigenous species of ecologically diverse taxa must be tested

4034 initially. If resident or indigenous species are not available for testing,

4035 non-resident species may be used if the non-resident species is of the same family

4036 or genus and has a similar habitat and environmental tolerance.

4037

4038 (Source: Amended at 46 Ill. Reg. _____, effective _____)

4039

4040 **Section 302.627 Determining the Chronic Aquatic Toxicity Criterion for an Individual**

4041 **Substance - General Procedures**

4042

4043 a) A chemical-specific Chronic Aquatic Toxicity Criterion (CATC) is calculated

4044 using procedures specified in subsection (b) when chronic toxicity data are

4045 available for at least five species from five different North American genera of

4046 freshwater organisms, including representatives from the following taxa:

4047

4048 1) Representatives of two families in the Class Osteichthyes (Bony Fishes).

4049

4050 2) The family Daphnidae.

4051

4052 3) A benthic aquatic macroinvertebrate.

4053

4054 4) An alga (96-hour test) or a vascular aquatic plant.

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- b) A CATC is derived in the same manner as the FAV in 35 Ill. Adm. [Code Sections Code](#) 302.615 or 302.618 by substituting CATC for FAV or FAI, chronic for acute, MATC for LC-50, SMCV (Species Mean Chronic Value) for SMAV, and GMCV (Genus Mean Chronic Value) for GMAV.

- c) If data are not available to meet the requirements of subsection (a), a CATC is calculated by dividing the FAV by the highest acute-chronic ratio obtained from at least one fish and one invertebrate species. The acute-chronic ratio for a species equals the acute toxicity concentration from data considered under 35 Ill. Adm. [Code Sections Code](#) 302.612 through 302.618, divided by the chronic toxicity concentration from data calculated under subsections (a) and (b) subject to the following conditions:
 - 1) If the toxicity of a substance is related to any water quality characteristic (WQC), the acute-chronic ratio must be based on acute and chronic toxicity data obtained from organisms exposed to test water with WQC values that are representative of the WQC values of the waterbody under consideration. Preference under this subsection must be given to data from acute and chronic tests done by the same author or in the same reference in order to increase the likelihood of comparable test conditions.
 - 2) If the toxicity of a substance is unrelated to water quality parameters, the acute-chronic ratio may be derived from any acute and chronic test on a species regardless of the similarity in values of those water quality parameters. Preference under this subsection must be given to data from acute and chronic tests done on the same organisms or their descendants.
 - 3) If there is more than one acute-chronic ratio for a species, a geometric mean of the ratio is calculated, corrected for the relationship of toxicity to water quality parameters.
 - 4) If the acute and chronic toxicity data indicate that the acute-chronic ratio varies with changes in water quality parameters, the acute-chronic ratio used over specified values of the water quality parameters must be based on the ratios at water quality parameter values closest to those specified.
 - 5) If acute and chronic toxicity data are unavailable to determine an

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4093 acute-chronic ratio for at least two North American freshwater species, a
4094 ratio of 25 ~~must~~shall~~must~~ be used.

4095
4096 d) If a resident or indigenous species whose presence is necessary to sustain
4097 commercial or recreational activities, or prevent disruptions of the waterbody's
4098 ecosystem, including but not limited to loss of species diversity or a shift to a
4099 biotic community dominated by pollution-tolerant species, will not be protected
4100 by the calculated CATC, then the MATC for that species is used as the CATC.

4101
4102 (Source: Amended at 46 Ill. Reg. _____, effective _____)

4103
4104 **Section 302.630 Determining the Chronic Aquatic Toxicity Criterion - Procedure for**
4105 **Combinations of Substances**

4106
4107 A CATC for any combination of substances (including effluent mixtures) may be determined by
4108 toxicity testing procedures pursuant to the following:

- 4109
- 4110 a) A ~~No~~ combination of substances must not ~~may~~ exceed concentrations greater than
4111 a NOAEL as determined for the most sensitive of the species tested.
 - 4112
 - 4113 b) Three resident or indigenous species of ecologically diverse taxa must be tested
4114 initially. If resident or indigenous species are not available for testing,
4115 non-resident species may be used if the non-resident species is of the same family
4116 or genus and has a similar habitat and environmental tolerance.
 - 4117

4118
4119 (Source: Amended at 46 Ill. Reg. _____, effective _____)

4120
4121 **Section 302.633 The Wild and Domestic Animal Protection Criterion**

4122
4123 The Wild and Domestic Animal Protection Criterion (WDAPC) is the concentration of a
4124 substance which if not exceeded protects Illinois wild and domestic animals from adverse
4125 effects, such as functional impairment or pathological lesions, resulting from ingestion of surface
4126 waters of the State and from ingestion of aquatic organisms taken from surface waters of the
4127 State.

- 4128
- 4129 a) For those substances for which a NOAEL has been derived from studies of
4130 mammalian or avian species exposed to the substance via oral routes including

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4131 gavage, the lowest NOAEL among species must be used in calculating the
4132 WDAPC. Additional considerations in selecting NOAEL include:

- 4133
- 4134 1) If the NOAEL is given in milligrams of toxicant per liter of water
4135 consumed (mg/L), prior to calculating the WDAPC, the NOAEL must be
4136 multiplied by the daily average volume of water consumed by the test
4137 animals in liters per day (L/d) and divided by the average weight of the
4138 test animals in kilograms (kg).
4139
- 4140 2) If the NOAEL is given in milligrams of toxicant per kilogram of food
4141 consumed (mg/kg), prior to calculating the WDAPC, the NOAEL must be
4142 multiplied by the average amount of food in kilograms consumed daily by
4143 the test animals (kg/d) and divided by the average weight of the test
4144 animals in kilograms (kg).
4145
- 4146 3) If the animals used in a study were not exposed to the toxicant each day of
4147 the test period, the NOAEL must be multiplied by the ratio of days of
4148 exposure to the total days in the test period.
4149
- 4150 4) If more than one NOAEL is available for the same animal species, the
4151 geometric mean of the NOAELs must be used to calculate the WDAPC.
4152

4153 b) For those substances for which a NOAEL is not available but the lowest observed
4154 adverse effect level (LOAEL) has been derived from studies of animal species
4155 exposed to the substance via oral routes including gavage, one-tenth of the
4156 LOAEL ~~must~~shall~~must~~ be substituted for the NOAEL.
4157

4158 c) The LOAEL must be selected in the same manner as that specified for the
4159 NOAEL in subsection (a).
4160

4161 d) The WDAPC, measured in milligrams per liter (mg/L), is calculated according to
4162 the equation:

4163

$$4164 \text{WDAPC} = [0.1 \text{NOAEL} \times \text{Wt}] / [\text{W} + (\text{F} \times \text{BCF})]$$

4165

4166 Where:
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~~NOAEL is derived from mammalian or avian studies as specified in subsections (a) and (b), and is measured in units of milligrams of substance per kilogram of body weight per day (mg/kg-d);~~

~~Wt = Average weight in kilograms (kg) of the test animals;~~

~~W = Average daily volume of water in liters consumed per day (L/d) by the test animals;~~

~~F = Average daily amount of food consumed by the test animals in kilograms (kg/d);~~

~~BCF = Aquatic life Bioconcentration Factor with units of liter per kilogram (L/kg), as derived in 35 Ill. Adm. Code Sections 302.660 through 302.666; and~~

~~The 0.1 represents an uncertainty factor to account for species variability.~~

NOAEL is derived from mammalian or avian studies as specified in subsections (a) and (b), and is measured in units of milligrams of substance per kilogram of body weight per day (mg/kg-d);
Wt = Average weight in kilograms (kg) of the test animals;
W = Average daily volume of water in liters consumed per day (l/d) by the test animals;
F = Average daily amount of food consumed by the test animals in kilograms (kg/d);
BCF = Aquatic life Bioconcentration Factor with units of liter per kilogram (L/kg), as derived in 35 Ill. Adm. Code 302.660 through 302.666; and
The 0.1 represents an uncertainty factor to account for species variability.

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e) If no studies pertaining to the toxic substance in question can be found by the Agency, no criterion can be determined.

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

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4193

4194 **Section 302.645 Determining the Acceptable Daily Intake**

4195

4196 The Acceptable Daily Intake (ADI) is the maximum amount of a substance which, if ingested
4197 daily for a lifetime, results in no adverse effects to humans. Subsections (a) through (e) list, in
4198 the order of preference, methods for determining the acceptable daily intake.

4199

4200 a) The lowest of the following ADI values:

4201

4202 1) For ~~those~~ substances ~~which are~~ listed with a maximum contaminant level
4203 in 40 CFR 141, incorporated by reference in 35 Ill. Adm. Code 301.106,
4204 or in 35 Ill. Adm. Code 611, the ADI equals the product of multiplying the
4205 maximum contaminant level given in milligrams per liter (mg/L) by 2
4206 liters per day (L/d).

4207

4208 2) For ~~those~~ substances which are listed with a maximum allowable
4209 concentration standard in 35 Ill. Adm. Code:— Subtitle F, the acceptable
4210 daily intake equals the product of multiplying the public health
4211 enforcement standard given in milligrams per liter (mg/L) by 2 liters per
4212 day (L/d).

4213

4214 b) For ~~those~~ substances for which a no observed adverse effect level (NOAEL-H) for
4215 humans exposed to the substance in drinking water has been derived, the
4216 acceptable daily intake equals the product of multiplying one-tenth of the
4217 NOAEL-H given in milligrams of toxicant per liter of water consumed (mg/L) by
4218 2 liters per day (L/d). The lowest NOAEL-H must be used in the calculation of
4219 the acceptable daily intake.

4220

4221 c) For ~~those~~ substances for which the lowest observed adverse effect level
4222 (LOAEL-H) for humans exposed to the substance in drinking water has been
4223 derived, one-hundredth of the LOAEL-H may be substituted for the NOAEL-H in
4224 subsection (b).

4225

4226 d) For ~~those~~ substances for which a no observed adverse effect level (NOAEL-A)
4227 has been derived from studies of mammalian test species exposed to the
4228 substance via oral routes including gavage, the acceptable daily intake equals the
4229 product of multiplying 1/100 of the NOAEL-A given in milligrams toxicant per
4230 day per kilogram of test species weight (mg/kg-d) by the average weight of an

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4231 adult human of 70 kilograms (kg). The lowest NOAEL-A among animal species
4232 must be used in the calculation of the acceptable daily intake. Additional
4233 considerations in selecting the NOAEL-A include:

- 4234
- 4235 1) If the NOAEL-A is given in milligrams of toxicant per liter of water
4236 consumed (mg/L) then, prior to calculating the acceptable daily intake, the
4237 NOAEL-A must be multiplied by the daily average volume of water
4238 consumed by the mammalian test species in liters per day (L/d) and
4239 divided by the average weight of the mammalian test species in kilograms
4240 (kg).
 - 4241
 - 4242 2) If the NOAEL-A is given in milligrams of toxicant per kilogram of food
4243 consumed (mg/kg), prior to calculating the acceptable daily intake the
4244 NOAEL-A must be multiplied by the average amount in kilograms of food
4245 consumed daily by the mammalian test species (kg/d) and divided by the
4246 average weight of the mammalian test species in kilograms (kg).
 - 4247
 - 4248 3) If the mammalian test species were not exposed to the toxicant each day of
4249 the test period, the NOAEL-A must be multiplied by the ratio of days of
4250 exposure to the total days of the test period.
 - 4251
 - 4252 4) If more than one NOAEL-A is available for the same mammalian test
4253 species, the geometric mean of the NOAEL-As must be used.
 - 4254
 - 4255 e) For ~~those~~ substances for which a NOAEL-A is not available but the lowest
4256 observed adverse effect level (LOAEL-A) has been derived from studies of
4257 mammalian test species exposed to the substance via oral routes including
4258 gavage, one-tenth of the LOAEL-A may be substituted for the NOAEL-A in
4259 subsection (d). The LOAEL-A must be selected in the same manner as that
4260 specified for the NOAEL-A in subsection (d).
 - 4261
 - 4262 f) If no studies pertaining to the toxic substance in question can be found by the
4263 Agency, no criterion can be determined.
 - 4264
 - 4265

4266 (Source: Amended at 46 Ill. Reg. _____, effective _____)

4267

4268 **Section 302.648 Determining the Human Threshold Criterion**

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4269

4270 The HTC is calculated according to the equation:

4271

4272
$$HTC = ADI/[W + (F \times BCF)]$$

4273

4274

where:

4275

4276 ~~HTC = Human health protection criterion in milligrams per liter (mg/L);~~

4277

4278 ~~ADI = Acceptable daily intake of substance in milligrams per day (mg/d)~~
4279 ~~as specified in 35 Ill. Adm. Code Section 302.645;~~

4280

4281 ~~W = Per capita daily water consumption equal to 2 liters per day (L/d)~~
4282 ~~for surface waters at the point of intake of a public or food processing~~
4283 ~~water supply, or equal to 0.01 liters per day (L/d) which represents~~
4284 ~~incidental exposure through contact or ingestion of small volumes of water~~
4285 ~~while swimming or during other recreational activities for areas which are~~
4286 ~~determined to be public access areas under 35 Ill. Adm. Code pursuant to~~
4287 ~~Section 302.102 (b)(3), or 0.001 liters per day (L/d) for other waters;~~

4288

4289 ~~F = Assumed daily fish consumption in the United States equal to 0.020~~
4290 ~~kilograms per day (kg/d); and~~

4291

4292 ~~BCF = Aquatic organism Bioconcentration Factor with units of liter per~~
4293 ~~kilogram (L/kg) as derived in 35 Ill. Adm. Code Sections 302.660 through~~
4294 ~~302.666.~~

4295

HTC = Human health protection criterion in milligrams per liter (mg/L);

ADI = Acceptable daily intake of substance in milligrams per day (mg/d) as specified in 35 Ill. Adm. Code 302.645;

W = Per capita daily water consumption equal to 2 liters per day (L/d) for surface waters at the point of intake of a public or food processing water supply, or equal to 0.01 liters per day (L/d) which represents incidental exposure through contact or ingestion of small volumes of water while swimming or during other recreational activities

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F = Assumed daily fish consumption in the United States equal to 0.020 kilograms per day (kg/d); and
BCF = Aquatic organism Bioconcentration Factor with units of liter per kilogram (L/kg) as derived in 35 Ill. Adm. Code 302.660 through 302.666.

4296

4297 (Source: Amended at 46 Ill. Reg. _____, effective _____)

4298

4299 Section 302.651 The Human Nonthreshold Criterion

4300

4301 The Human Nonthreshold Criterion (HNC) of a substance is that concentration or level of a
4302 substance at which humans are protected from an unreasonable risk of disease caused by a
4303 nonthreshold toxic mechanism as a result of incidental exposure to or ingestion of surface waters
4304 of the State and from ingestion of aquatic organisms taken from surface waters of the State.
4305 HNCs are derived for those toxic substances for which any exposure, regardless of extent,
4306 carries some risk of damage as specified in subsections (a) and (b).

4307

4308 a) For single substances, a risk level of one in one million (1 in 1,000,000)
4309 ~~must shall~~ must be allowed (i.e, considered acceptable) for the purposes of
4310 ~~determining determination of~~ determining an HNC.

4311

4312 b) For mixtures of substances, an additive risk level of one in one hundred thousand
4313 (1 in 100,000) ~~must shall~~ must be allowed (i.e, considered acceptable) for the
4314 purposes of ~~determining determination of~~ determining an HNC.

4315

4316 (Source: Amended at 46 Ill. Reg. _____, effective _____)

4317

4318 Section 302.654 Determining the Risk Associated Intake

4319

4320 The Risk Associated Intake (RAI) is the maximum amount of a substance which if ingested daily
4321 for a lifetime is expected to result in the risk of one additional case of human cancer in a
4322 population of one million. Where more than one carcinogenic chemical is present, the RAI
4323 ~~must shall~~ must be based on an allowed additive risk of one additional case of cancer in a
4324 population of one hundred thousand. The RAI must be derived as specified in subsections (a)
4325 through (c).

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- a) For those substances for which a human epidemiologic study has been performed, the RAI equals the product of the dose from exposure in units of milligrams toxicant per kilogram body weight per day (mg/kg-d) that results in a 70-year lifetime cancer probability of one in one million, times the average weight of an adult human of 70 kilograms (kg). The resulting RAI is expressed in milligrams toxicant per day (mg/d). If more than one human epidemiologic study is available, the lowest exposure level resulting in a 70-year lifetime probability of cancer equal to a ratio of one in one hundred thousand must be used in calculating the RAI.
- b) In the absence of an epidemiologic study, for those toxic substances for which a carcinogenic potency factor (CPF) has been derived from studies of mammalian test species the risk associated intake is calculated from the equation:

$$RAI = K/CPF$$

Where:

~~RAI = Risk associated intake in milligrams per day (mg/d);~~

~~K = A constant consisting of the product of the average weight of an adult human, assumed to be 70 kg, and the allowed cancer risk level of one in one million (1/1,000,000); and~~

~~CPF = Carcinogenic Potency Factor is the risk of one additional cancer per unit dose from exposure. The CPF is expressed in units of inverse milligrams per kilogram day (1/mg/kg-d) as derived in subsections (b)(1) through (b)(7).~~

RAI = Risk associated intake in milligrams per day (mg/d);
K = A constant consisting of the product of the average weight of an adult human, assumed to be 70 kg, and the allowed cancer risk level of one in one million (1/1,000,000); and
CPF = Carcinogenic Potency Factor is the risk of one additional cancer per unit dose from exposure. The CPF is expressed in units of inverse milligrams per kilogram - day (1/mg/kg-d) as derived in

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subsections (b)(1) through (b)(7).

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- 1) Only those studies which fulfill the data requirement criteria of 35 Ill. Adm. ~~Code~~Section~~Code~~ 302.606 ~~must~~shall~~must~~ be used in calculating the CPF.
- 2) The linear non-threshold dose-response relationship developed in the same manner as in the USEPA document "Mutagenicity and Carcinogenicity Assessment of 1,3-butadiene", incorporated by reference in 35 Ill. Adm. Code 301.106, ~~must~~shall be used in obtaining the unit risk, defined as the 95th percentile upper bound risk of one additional cancer resulting from a life time exposure to a unit concentration of the substance being considered. The CPF ~~must~~shall~~must~~ be estimated from the unit risk in ~~compliance~~accordance~~compliance~~ with subsection (b)(7). In calculating a CPF, the Agency must review alternate scientifically valid protocols if so requested.
- 3) If in a study of a single species more than one type of tumor is induced by exposure to the toxic substance, the highest of the CPFs is used.
- 4) If two or more studies vary in either species, strain or sex of the test animal, or in tumor type, the highest CPF is used.
- 5) If more than one tumor of the same type is found in some of the test animals, these should be pooled so that the dose response relationship is dose versus number of tumors per animal. The potency estimate for this dose response relationship is used if it is higher than estimates resulting from other methods.
- 6) If two or more studies are identical regarding species, strain and sex of the test animal, and tumor type, the highest of the CPFs is used.
- 7) Calculation of an equivalent dose between animal species and humans using a surface area conversion, and conversion of units of exposure to dose in milligrams of toxicant per kilogram of body weight per day (mg/kg-d) must be performed as specified in the USEPA document "Mutagenicity and Carcinogenicity Assessment of 1,3-butadiene", incorporated by reference in 35 Ill. Adm. Code 301.106.

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c) If both a human epidemiologic study and a study of mammalian test species are available for use in subsections (a) and (b), the risk associated intake is determined as follows:

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1) When the human epidemiologic study provides evidence of a carcinogenic effect on humans, the RAI is calculated from the human epidemiology study as specified in subsection (a).

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2) When the mammalian study provides evidence a carcinogenic effect on humans, but the human epidemiologic study does not, a cancer risk to humans is assumed and the risk associated intake is calculated as specified in subsection (b).

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

4409

4410 Section 302.657 Determining the Human Nonthreshold Criterion

4411

4412 The HNC is calculated according to the equation:

4413

$$\text{HNC} = \text{RAI} / [\text{W} + (\text{F} \times \text{BCF})]$$

4414

4415

4416 where:

4417

4418

~~HNC = Human Nonthreshold Protection Criterion in milligrams per liter (mg/L);~~

4419

4420

4421

~~RAI = Risk Associated Intake of a substance in milligrams per day (mg/d) which is associated with a lifetime cancer risk level equal to a ratio of one to 1,000,000 as derived in 35 Ill. Adm. Code Section 302.654;~~

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~~W = Per capita daily water consumption equal to 2 liters per day (L/d) for surface waters at the point of intake of a public or food processing water supply, or equal to 0.01 liters per day (L/d) which represents incidental exposure through contact or ingestion of small volumes of water while swimming or during other recreational activities for areas which are determined to be public access areas under 35 Ill. Adm.~~

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4431 ~~Code pursuant to Section 302.102(b)(3), or 0.001 liters per day (L/d) for~~
4432 ~~other waters;~~

4433
4434 ~~F = Assumed daily fish consumption in the United States equal to~~
4435 ~~0.020 kilograms per day (kg/d); and~~

4436
4437 ~~BCF = Aquatic Life Bioconcentration Factor with units of liter per~~
4438 ~~kilogram (L/kg) as derived in 35 Ill. Adm. Code Section 302.663.~~
4439

HNC = Human Nonthreshold Protection Criterion in milligrams per liter (mg/L);
RAI = Risk Associated Intake of a substance in milligrams per day (mg/d) which is associated with a lifetime cancer risk level equal to a ratio of one to 1,000,000 as derived in 35 Ill. Adm. Code 302.654;
W = Per capita daily water consumption equal to 2 liters per day (L/d) for surface waters at the point of intake of a public or food processing water supply, or equal to 0.01 liters per day (L/d) which represents incidental exposure through contact or ingestion of small volumes of water while swimming or during other recreational activities for areas which are determined to be public access areas under 35 Ill. Adm. Code 302.102(b)(3), or 0.001 liters per day (L/d) for other waters;
F = Assumed daily fish consumption in the United States equal to 0.020 kilograms per day (kg/d); and
BCF = Aquatic Life Bioconcentration Factor with units of liter per kilogram (L/kg) as derived in 35 Ill. Adm. Code 302.663.

4440
4441 (Source: Amended at 46 Ill. Reg. _____, effective _____)
4442

4443 Section 302.658 Stream Flow for Application of Human Nonthreshold Criterion

4444
4445 The HNC applies ~~shall apply~~ at all times except during periods when flows are less than the
4446 harmonic mean flow (Q_{hm}), as determined by:

4447
4448
$$Q_{hm} = N / \text{SUM}(1/Q_i)$$

4449

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4450 Where:

4451

4452 ~~Q_{hm} = harmonic mean flow,~~

4453

4454 ~~N = number of daily values for stream flows, and~~

4455

4456 ~~Q_i = daily streamflow value on day i .~~

4457

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Q_{hm} = harmonic mean flow,
 N = number of daily values for stream flows, and
 Q_i = daily streamflow value on day i .

4460

4461 (Source: Amended at 46 Ill. Reg. _____, effective _____)

4462

4463 **Section 302.663 Determination of Bioconcentration Factors**

4464

4465 A Bioconcentration Factor equals the concentration of a substance in all or part of an aquatic
4466 organism in milligrams per kilogram of wet tissue weight (mg/kg), divided by the concentration
4467 of the substance in the water to which the organism is exposed in milligrams of the substance per
4468 liter of water (mg/L).

4469

4470 a) The Bioconcentration Factor is calculated from a field study if the following
4471 conditions are met:

4472

4473 1) Data are available to show that the concentration of the substance in the
4474 water to which the organism was exposed remained constant over the
4475 range of territory inhabited by the organism and for a period of time
4476 exceeding 28 days;

4477

4478 2) Competing mechanisms for removal of the substance from solution did
4479 not affect the bioavailability of the substance; and

4480

4481 3) The concentration of the substance to which the organism was exposed is
4482 less than the lowest concentration causing any adverse effects on the
4483 organism.

4484

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- 4485 b) In the absence of a field-derived Bioconcentration Factor, the Bioconcentration
4486 Factor is calculated from a laboratory test if the following conditions are met:
4487
4488 1) The Bioconcentration Factor was calculated from measured concentrations
4489 of the toxic substance in the test solution;
4490
4491 2) The laboratory test was of sufficient duration to have reached steady-state
4492 which is defined as a less than 10 percent change in the calculated
4493 Bioconcentration Factor over a 2-day period or 16 percent of the test
4494 duration whichever is longer. In the absence of a laboratory test which has
4495 reached steady-state, the Bioconcentration Factor may be calculated from
4496 a laboratory test with a duration greater than 28 days if more than one test
4497 is available for the same species of organism;
4498
4499 3) The concentration of the toxic substance to which the test organism was
4500 exposed is less than the lowest concentration causing any adverse effects
4501 on the organism;
4502
4503 4) If more than one Bioconcentration Factor for the same species is available,
4504 the geometric mean of the Bioconcentration Factors is used; and
4505
4506 5) The Bioconcentration Factor is calculated on a wet tissue weight basis. A
4507 Bioconcentration Factor calculated using dry tissue weight must ~~shall~~ be
4508 converted to a wet tissue weight basis by multiplying the dry weight
4509 bioconcentration value by 0.1 for plankton and by 0.2 for individual
4510 species of fishes and invertebrates.

- 4511
4512 c) In the absence of any Bioconcentration Factors measured from field studies as
4513 specified in subsection (a) or laboratory studies which have reached steady-state
4514 as specified in subsection (b), the Bioconcentration Factor is calculated according
4515 to the equation:

$$\log BCF = A + B \log Kow$$

Where:

BCF = Bioconcentration Factor;

4522

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4523 Kow = The octanol/water partition coefficient measured as
4524 specified in ASTM E 1147, incorporated by reference in 35 Ill.
4525 Adm. Code 301.106 (If the Kow is not available from laboratory
4526 testing, it ~~must~~shallmust be calculated from structure-activity
4527 relationships or available regression equations.); and

4528
4529 The constants A = -0.23 and B = 0.76 ~~must~~shallmust be used
4530 unless a change in the value of the constants is requested (The
4531 Agency ~~must~~shallmust honor requests for changes only if such
4532 changes are accompanied by scientifically valid supporting data.).

4533
4534 (Source: Amended at 46 Ill. Reg. _____, effective _____)
4535

4536 Section 302.666 Utilizing the Bioconcentration Factor

4537

4538 The Bioconcentration Factor derived in 35 Ill. Adm. ~~CodeSection~~Code 302.663 is used to
4539 calculate water quality criteria for a substance as specified below:

4540

4541 a) When calculating a WDAPC as described in 35 Ill. Adm. ~~CodeSection~~Code
4542 302.633, the geometric mean of all available steady-state whole body
4543 Bioconcentration Factors for fish and shellfish species which constitutes or
4544 represents a portion of the diet of indigenous wild and domestic animal species is
4545 used. Additional considerations in deriving a Bioconcentration Factor include:

4546

4547 1) An edible portion Bioconcentration Factor is converted to a whole body
4548 Bioconcentration Factor for a fish or shellfish species by multiplying the
4549 edible portion Bioconcentration Factor by the ratio of the percent lipid in
4550 the whole body to the percent lipid in the edible portion of the same
4551 species.

4552

4553 2) A Bioconcentration Factor calculated as described in 35 Ill. Adm.
4554 ~~CodeSection~~Code 302.663(c) is converted to a whole body
4555 Bioconcentration Factor by multiplying the calculated Bioconcentration
4556 Factor by the ratio of the percent lipid in the whole body to 7.6.

4557

4558 b) When calculating either a human threshold criterion or a human nonthreshold
4559 criterion as described in 35 Ill. Adm. ~~CodeSections~~Code 302.642 through 302.648
4560 and 35 Ill. Adm. ~~CodeSections~~Code 302.651 through 302.657, respectively, the

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4561 geometric mean of all available edible portion Bioconcentration Factors for fish
4562 and shellfish species consumed by humans is used. Additional considerations in
4563 deriving a Bioconcentration Factor include:

- 4564
- 4565 1) Edible portions include:
- 4566
- 4567 A) Decapods ~~---~~ == muscle tissue.
- 4568
- 4569 B) Bivalve molluscs ~~---~~ == total living tissue.
- 4570
- 4571 C) Scaled fishes ~~---~~ == boneless, scaleless filets including skin except for
- 4572 bloater chubs in which the edible portion is the whole body
- 4573 excluding head, scales and ~~visceravisera~~ viscera.
- 4574
- 4575 D) Smooth-skinned fishes ~~---~~ == boneless, skinless filets.
- 4576
- 4577 2) A whole body Bioconcentration Factor is converted to an edible portion
- 4578 Bioconcentration Factor by multiplying the whole body Bioconcentration
- 4579 Factor of a species by the ratio of the percent lipid in the edible portion to
- 4580 the percent lipid in the whole body of the same species.
- 4581
- 4582 3) A Bioconcentration Factor calculated as described in 35 Ill. Adm.
- 4583 ~~CodeSection-Code~~ Code 302.663 is converted to an edible portion
- 4584 Bioconcentration Factor by multiplying the calculated Bioconcentration
- 4585 Factor by the ratio of the percent lipid in the edible portion to 7.6.
- 4586

4587 (Source: Amended at 46 Ill. Reg. _____, effective _____)

4588

4589 **Section 302.669 Listing of Derived Criteria**

- 4590
- 4591 a) The Agency must ~~shall~~ develop and maintain a listing of toxicity criteria pursuant
- 4592 to this Subpart. This list must ~~shall~~ be made available to the public and updated
- 4593 whenever a new criterion is derived and must ~~shall~~ be published when updated in
- 4594 the Illinois Register.
- 4595
- 4596 b) A criterion published pursuant to subsection (a) may be proposed to the Board for
- 4597 adoption as a numeric water quality standard.
- 4598

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- 4599 c) The Agency must ~~shall~~ maintain for inspection all information including, ~~but not~~
4600 ~~limited to~~, assumptions, toxicity data and calculations used to ~~derive in the~~
4601 ~~derivation of~~ derive any toxicity criterion listed pursuant to subsection (a) until
4602 adopted by the Board as a water quality standard.
4603

4604 (Source: Amended at 46 Ill. Reg. , effective)

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4606 Section 302. APPENDIX A References to Previous Rules (Repealed)

4607

4608 ~~The following table is provided to aid in referencing old Board rule numbers to section numbers~~

4609 ~~pursuant to codification:~~

Chapter 3: Water Pollution Part II, Water Quality Standards	35 Ill. Admin. Code Parts 302 and 303
--	--

Unnumbered Preamble	Section 302.101
Rule 201	Section 302.102
Rule 202	Section 302.103
Rule 203	Section 302.201, Section 302.202, Section 303.201
Rule 203(a)	Section 302.203
Rule 203(b)	Section 302.204
Rule 203(c)	Section 302.205
Rule 203(d)	Section 302.206
Rule 203(e)	Section 302.207
Rule 203(f)	Section 302.208
Rule 203(g)	Section 302.209
Rule 203(h)	Section 302.210
Rule 203(i)	Section 302.211(a)
Rule 203(i)(1)	Section 302.211(b)
Rule 203(i)(2)	Section 302.211(c)
Rule 203(i)(3)	Section 302.211(d)
Rule 204(i)(4)	Section 302.211(e)
	Section 303.311
	Section 303.321
	Section 303.331
	Section 303.341
	Section 303.351
	Section 303.361
Rule 203(i) (Unnumbered Paragraph)	Section 302.104
Rule 203(i)(5)	Section 302.211(f)
Rule 203(i)(6)	Section 302.211(g)
Rule 203(i)(7)	Section 302.211(h)
Rule 203(i)(8)	Section 302.211(i)
Rule 203(i)(9)	Deleted

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Rule 203(i)(10)	Section 302.211(j), 303.500
Rule 203(i)(11)(bb)	Section 303.502
Rule 203.1(a)	Section 303.312
Rule 203.1(b)	Section 303.352
Rule 204	Section 302.301
	Section 302.302
	Section 303.202
Rule 204(a)	Section 302.303
Rule 204(b)	Section 302.304
Rule 204(c)	Section 302.305
Rule 205	Section 302.401
Rule 205(a)	Section 302.403
Rule 205(b)	Section 302.404
Rule 205(c)	Section 302.405
Rule 205(d)	Section 302.406
Rule 205(e)	Section 302.407
Rule 205(f)	Section 302.408
Rule 205(g)	Section 302.409
Rule 205(h)	Section 302.410
Rule 206	Section 302.501
Rule 206(a)	Section 302.502
Rule 206(b)	Section 302.503
Rule 206(c)	Section 302.504
Rule 206(d)	Section 302.505
Rule 206(e)	Section 302.506(a)
Rule 206(e)(1)(A)	Section 302.507(a)
Rule 206(e)(1)(B)	Section 302.507(b)
Rule 206(e)(1)(C)	Section 302.506(b)
Rule 206(e)(1)(D)	Section 302.506(c)
Rule 206(e)(2)	Section 302.508
Rule 206(e)(3)	Section 302.509
Rule 207	Section 303.203
Rule 208	Section 302.105

4610

4611 (Source: Repealed at 46 Ill. Reg. _____, effective _____)

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4613 Section 302. APPENDIX B Sources of Codified Sections (Repealed)
4614

~~35 Ill. Adm. Code
Parts 302 and 303~~

~~Chapter 3: Water Pollution
Part II, Water Quality Standards
Part III, Water Use Designations~~

Section

302.101	General, Unnumbered preamble to Part II
302.102(a)	Rule 201(a)
302.102(b)	Rule 201(a)
302.102(c)	Rule 201(b)
302.103	Rule 202
302.104	Rule 203(i)
302.105	Rule 208
302.201	General, Rule 203
302.202	Rule 203
302.203	Rule 203(a)
302.204	Rule 203(b)
302.205	Rule 203(c)
302.206	Rule 203(d)
302.207	Rule 203(e)
302.208	Rule 203(f)
302.209	Rule 203(g)
302.210	Rule 203(h)
302.211(a)	Rule 203(i)
302.211(b)	Rule 203(i)(1)
302.211(c)	Rule 203(i)(2)
302.211(d)	Rule 203(i)(3)
302.211(e)	Rule 203(i)(4)
302.211(f)	Rule 203(i)(5)
302.211(g)	Rule 203(i)(6)
302.211(h)	Rule 203(i)(7)
302.211(i)	Rule 203(i)(8)
302.211(j)	Rule 203(i)(10)
302.301	General, Rule 204, Rule 303

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302.302	Rule 204
302.303	Rule 204(a)
302.304	Rule 204(b)
302.305	Rule 204(c)
302.401	General, Rule 205, Rule 302
302.402	Rule 302
302.403	Rule 205(a)
302.404	Rule 205(b)
302.405	Rule 205(c)
302.406	Rule 205(d)
302.407	Rule 205(e)
302.408	Rule 205(f)
302.409	Rule 205(g)
302.410	Rule 205(h)
302.501	General, Rule 206
302.502	Rule 206(a)
302.503	Rule 206(b)
302.504	Rule 206(c)
302.505	Rule 206(d)
302.506(a)	Rule 206(e)
302.506(b)	Rule 206(e)(1)(C)
302.506(c)	Rule 206(e)(1)(D)
302.507(a)	Rule 206(e)(1)(A)
302.507(b)	Rule 206(e)(1)(B)
302.508	Rule 206(e)(2)
302.509	Rule 206(e)(3)

4615

4617 (Source: Repealed at 46 Ill. Reg. _____, effective _____)

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Total changes	2848
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