

## Section 302.208 Numeric Standards for Chemical Constituents

- a) The acute standard (AS) for the chemical constituents listed in subsection (e) shall not be exceeded at any time except for those waters for which a zone of initial dilution (ZID) has been approved by the Agency pursuant to Section 302.102.
- b) The chronic standard (CS) for the chemical constituents listed in subsection (e) shall not be exceeded by the arithmetic average of at least four consecutive samples collected over any period of at least four days, except for those waters in which the Agency has approved a mixing zone or in which mixing is allowed pursuant to Section 302.102. The samples used to demonstrate attainment or lack of attainment with a CS must be collected in a manner that assures an average representative of the sampling period. For the chemical constituents that have water quality based standards dependent upon hardness, the chronic water quality standard will be calculated according to subsection (e) using the hardness of the water body at the time the sample was collected. To calculate attainment status of chronic metals standards, the concentration of the chemical constituent in each sample is divided by the calculated water quality standard for the sample to determine a quotient. The water quality standard is attained if the mean of the sample quotients is less than or equal to one for the duration of the averaging period.
- c) The human health standard (HHS) for the chemical constituents listed in subsection (f) shall not be exceeded when the stream flow is at or above the harmonic mean flow pursuant to Section 302.658 nor shall an annual average, based on at least eight samples, collected in a manner representative of the sampling period, exceed the HHS except for those waters in which the Agency has approved a mixing zone or in which mixing is allowed pursuant to Section 302.102.
- d) The standard for the chemical constituents of subsections (g) and (h) shall not be exceeded at any time except for those waters in which the Agency has approved a mixing zone or in which mixing is allowed pursuant to Section 302.102.
- e) Numeric Water Quality Standards for the Protection of Aquatic Organisms

| Constituent                          | AS (µg/L)        | CS (µg/L)        |
|--------------------------------------|------------------|------------------|
| Arsenic<br>(trivalent,<br>dissolved) | 360 X 1.0* = 360 | 190 X 1.0* = 190 |
| Boron (total)                        | 40,100           | 7,600            |

|                                       |                                                                                             |                                                                                             |
|---------------------------------------|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Cadmium<br>(dissolved)                | $e^{A+B \ln(H)} \times \left\{ 1.138672 - \frac{1.138672}{[(\ln(H))(0.041838)]} \right\} *$ | $e^{A+B \ln(H)} \times \left\{ 1.101672 - \frac{1.101672}{[(\ln(H))(0.041838)]} \right\} *$ |
|                                       | where A = -2.918 and<br>B = 1.128                                                           | where A = -3.490 and<br>B = 0.7852                                                          |
| Chromium<br>(hexavalent,<br>total)    | 16                                                                                          | 11                                                                                          |
| Chromium<br>(trivalent,<br>dissolved) | $e^{A+B \ln(H)} \times 0.316 *$                                                             | $e^{A+B \ln(H)} \times 0.860 *$                                                             |
|                                       | where A = 3.688 and<br>B = 0.8190                                                           | where A = 1.561 and<br>B = 0.8190                                                           |
| Copper<br>(dissolved)                 | $e^{A+B \ln(H)} \times 0.960 *$                                                             | $e^{A+B \ln(H)} \times 0.960 *$                                                             |
|                                       | where A = -1.464 and<br>B = 0.9422                                                          | where A = -1.465 and<br>B = 0.8545                                                          |
| Cyanide**                             | 22                                                                                          | 5.2                                                                                         |
| Fluoride (total)                      | $e^{A+B \ln(H)}$                                                                            | $e^{A+B \ln(H)}$ , but shall not<br>exceed 4.0 mg/L                                         |
|                                       | where A = 6.7319 and<br>B = 0.5394                                                          | where A = 6.0445 and<br>B = 0.5394                                                          |
| Lead<br>(dissolved)                   | $e^{A+B \ln(H)} \times \left\{ 1.46203 - \frac{1.46203}{[(\ln H)(0.1457/2)]} \right\} *$    | $e^{A+B \ln(H)} \times \left\{ 1.46203 - \frac{1.46203}{[(\ln H)(0.145712)]} \right\} *$    |
|                                       | where A = -1.301 and<br>B = 1.273                                                           | where A = -2.863 and<br>B = 1.273                                                           |
| Manganese                             | $e^{A+B \ln(H)} \times 0.9812 *$                                                            | $e^{A+B \ln(H)} \times 0.9812 *$                                                            |
|                                       | where A = 4.9187 and<br>B = 0.7467                                                          | where A = 4.0635 and<br>B = 0.7467                                                          |
| Mercury<br>(dissolved)                | 2.6 X 0.85* = 2.2                                                                           | 1.3 X 0.85* = 1.1                                                                           |

|                       |                                        |                                         |
|-----------------------|----------------------------------------|-----------------------------------------|
| Nickel<br>(dissolved) | $e^{A+B \ln(H)} \times 0.998 *$        | $e^{A+B \ln(H)} \times 0.997 *$         |
|                       | where $A = 0.5173$ and<br>$B = 0.8460$ | where $A = -2.286$ and<br>$B = 0.8460$  |
| TRC                   | 19                                     | 11                                      |
| Zinc<br>(dissolved)   | $e^{A+B \ln(H)} \times 0.978 *$        | $e^{A+B \ln(H)} \times 0.986 *$         |
|                       | where $A = 0.9035$ and<br>$B = 0.8473$ | where $A = -0.4456$ and<br>$B = 0.8473$ |
| 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
- $*$  = conversion factor multiplier for dissolved metals
- $**$  = standard to be evaluated using either of the following USEPA approved methods, incorporated by reference at 35 Ill. Adm. Code 301.106: Method OIA-1677, DW: Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry, January 2004, Document Number EPA-821-R-04-001 or Cyanide Amenable to Chlorination, Standard Methods 4500-CN-G (40 CFR 136.3)

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

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

where:

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

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

| Constituent      | Unit            |       | Standard |
|------------------|-----------------|-------|----------|
| Barium (total)   | mg/L            |       | 5.0      |
| Chloride (total) | mg/L            |       | 500      |
| Iron (dissolved) | mg/L            | 01046 | 1.0      |
| Phenols          | mg/L            |       | 0.1      |
| Selenium (total) | mg/L            |       | 1.0      |
| Silver (total)   | $\mu\text{g/L}$ |       | 5.0      |

where:

$\text{mg/L}$  = milligram per liter and

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

- h) Water quality standards for sulfate are as follows:

- 1) At any point where water is withdrawn or accessed for purposes of livestock watering, the average of sulfate concentrations must not exceed 2,000 mg/L when measured at a representative frequency over a 30 day period.
- 2) The results of the following equations provide sulfate water quality standards in mg/L for the specified ranges of hardness (in mg/L as  $\text{CaCO}_3$ ) and chloride (in mg/L) and must be met at all times:
  - A) If the hardness concentration of receiving waters is greater than or equal to 100 mg/L but less than or equal to 500 mg/L, and if the chloride concentration of waters is greater than or equal to 25 mg/L but less than or equal to 500 mg/L, then:

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

where:

C = sulfate concentration

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

concentration of waters is greater than or equal to 5 mg/L but less than 25 mg/L, then:

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

where:

C = sulfate concentration

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

(Source: Amended at 36 Ill. Reg. 18871, effective December 12, 2012)

### **Section 302.303 Finished Water Standards**

Water shall be of such quality that with treatment consisting of coagulation, sedimentation, filtration, storage and chlorination, or other equivalent treatment processes, the treated water shall meet in all respects the requirements of Part 611.

(Note: Prior to codification, Table I, Rule 304 of Ch 6: Public Water Supplies)

(Source: Amended at 36 Ill. Reg. 18871, effective December 12, 2012)

## Section 302.304 Chemical Constituents

The following levels of chemical constituents shall not be exceeded:

| CONSTITUENT                                                               | CONCENTRATION<br>(mg/1) |
|---------------------------------------------------------------------------|-------------------------|
| 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<br>or equivalent)                                    | 0.1                     |
| Organics                                                                  |                         |
| Pesticides                                                                |                         |
| Chlorinated Hydro-<br>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<br>Insecticides                                           |                         |
| Parathion                                                                 | 0.1                     |
| Chlorophenoxy Herbicides                                                  |                         |
| 2,4-Dichlorophenoxy-<br>acetic acid (2,4-D)                               | 0.1                     |
| 2-(2,4,5-Trichloro-<br>phenoxy)-propionic<br>acid (2,4,5-TP<br>or Silvex) | 0.01                    |
| Phenols                                                                   | 0.001                   |
| Selenium (total)                                                          | 0.01                    |

|                        |     |
|------------------------|-----|
| Sulphates              | 250 |
| Total Dissolved Solids | 500 |

(Source: Amended at 36 Ill. Reg. 18871, effective December 12, 2012)

### Section 302.504 Chemical Constituents

The following concentrations of chemical constituents must not be exceeded, except as provided in Sections 302.102 and 302.530:

- a) The following standards must be met in all waters of the Lake Michigan Basin. Acute aquatic life standards (AS) must not be exceeded at any time except for those waters for which the Agency has approved a zone of initial dilution (ZID) pursuant to Sections 302.102 and 302.530. Chronic aquatic life standards (CS) and human health standards (HHS) must not be exceeded outside of waters in which mixing is allowed pursuant to Sections 302.102 and 302.530 by the arithmetic average of at least four consecutive samples collected over a period of at least four days. The samples used to demonstrate compliance with the CS or HHS must be collected in a manner which assures an average representation of the sampling period.

| <u>Constituent</u>              | <u>Unit</u> | <u>AS</u>                                                                                                  | <u>CS</u>                                                                                                  | <u>HHS</u> |
|---------------------------------|-------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|------------|
| Arsenic (Trivalent, dissolved)  | µg/L        | $340 \times 1.0^* = 340$                                                                                   | $340 \times 1.0^* = 148$                                                                                   | NA         |
| Boron (total)                   | mg/L        | 40.1                                                                                                       | 7.6                                                                                                        | NA         |
| Cadmium (dissolved)             | µg/L        | $\exp[A + B \ln(H)] \times \{1.138672 - [(1 \ln H) (0.041838)]\}^*$<br>where $A = -3.6867$ and $B = 1.128$ | $\exp[A + B \ln(H)] \times \{1.101672 - [(1 \ln H) (0.041838)]\}^*$<br>where $A = -2.715$ and $B = 0.7852$ | NA         |
| Chromium (Hexavalent, total)    | µg/L        | 16                                                                                                         | 11                                                                                                         | NA         |
| Chromium (Trivalent, dissolved) | µg/L        | $\exp[A + B \ln(H)] \times 0.316^*$<br>where $A = 3.7256$ and $B = 0.819$                                  | $\exp[A + B \ln(H)] \times 0.860^*$<br>where $A = 0.6848$ and $B = 0.819$                                  | NA         |
| Copper (dissolved)              | µg/L        | $\exp[A + B \ln(H)] \times$                                                                                | $\exp[A + B \ln(H)] \times$                                                                                | NA         |

|                          |      |                                                                                                                       |                                                                                                                       |    |
|--------------------------|------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|----|
|                          |      | 0.960*                                                                                                                | 0.960*                                                                                                                |    |
|                          |      | where $A = -1.700$<br>and $B = 0.9422$                                                                                | where $A = -1.702$<br>and $B = 0.8545$                                                                                |    |
| Cyanide**                | µg/L | 22                                                                                                                    | 5.2                                                                                                                   | NA |
| Fluoride (total)         | µg/L | $\exp[A + B \ln(H)]$<br>where $A = 6.7319$<br>and $B = 0.5394$                                                        | $\exp[A + B \ln(H)]$ ,<br>but shall not<br>exceed 4.0 mg/L<br>where $A = 6.0445$<br>and $B = 0.5394$                  | NA |
| Lead (dissolved)         | µg/L | $\exp[A + B \ln(H)] \times$<br>$\{1.46203 - [(1 \ln H)$<br>$(0.145712)]\}^*$<br>where $A = -1.055$<br>and $B = 1.273$ | $\exp[A + B \ln(H)] \times$<br>$\{1.46203 - [(1 \ln H)$<br>$(0.145712)]\}^*$<br>where $A = -4.003$<br>and $B = 1.273$ | NA |
| Manganese<br>(dissolved) | µg/L | $\exp[A + B \ln(H)] \times$<br>$0.9812^*$<br>where $A = 4.9187$<br>and $B = 0.7467$                                   | $\exp[A + B \ln(H)] \times$<br>$0.9812^*$<br>where $A = 4.0635$<br>and $B = 0.7467$                                   | NA |
| Nickel (dissolved)       | µg/L | $\exp[A + B \ln(H)] \times$<br>$0.998^*$<br>where $A = 2.255$<br>and $B = 0.846$                                      | $\exp[A + B \ln(H)] \times$<br>$0.997^*$<br>where $A = 0.0584$<br>and $B = 0.846$                                     | NA |
| Selenium<br>(dissolved)  | µg/L | NA                                                                                                                    | 5.0                                                                                                                   | NA |
| TRC                      | µg/L | 19                                                                                                                    | 11                                                                                                                    | NA |
| Zinc (dissolved)         | µg/L | $\exp[A + B \ln(H)] \times$<br>$0.978^*$<br>where $A = 0.884$<br>and $B = 0.8473$                                     | $\exp[A + B \ln(H)] \times$<br>$0.986^*$<br>where $A = 0.884$<br>and $B = 0.8473$                                     | NA |

|                    |      |                                       |                                       |      |
|--------------------|------|---------------------------------------|---------------------------------------|------|
| Benzene            | µg/L | 3900                                  | 800                                   | 310  |
| Chlorobenzene      | mg/L | NA                                    | NA                                    | 3.2  |
| 2,4-Dimethylphenol | mg/L | NA                                    | NA                                    | 8.7  |
| 2,4-Dinitrophenol  | mg/L | NA                                    | NA                                    | 2.8  |
| Endrin             | µg/L | 0.086                                 | 0.036                                 | NA   |
| Ethylbenzene       | µg/L | 150                                   | 14                                    | NA   |
| Hexachloroethane   | µg/L | NA                                    | NA                                    | 6.7  |
| Methylene chloride | mg/L | NA                                    | NA                                    | 2.6  |
| Parathion          | µg/L | 0.065                                 | 0.013                                 | NA   |
| Pentachlorophenol  | µg/L | $\exp B([pH] + A)$                    | $\exp B([pH] + A)$                    | NA   |
|                    |      | where $A = -4.869$<br>and $B = 1.005$ | where $A = -5.134$<br>and $B = 1.005$ |      |
| Toluene            | µg/L | 2000                                  | 610                                   | 51.0 |
| Trichloroethylene  | µg/L | NA                                    | NA                                    | 370  |
| Xylene(s)          | µg/L | 1200                                  | 490                                   | NA   |

where:

NA = Not Applied

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

$\ln(H)$  = natural logarithm of Hardness

\*

= conversion factor multiplier for dissolved metals

\*\* = standard to be evaluated using either of the following USEPA approved methods, incorporated by reference at 35 Ill. Adm. Code 302.510: Method OIA-1677, DW: Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry, January 2004, Document Number EPA-821-R-04-001 or Cyanide Amenable to Chlorination, Standard Methods 4500-CN-G (40 CFR 136.3).

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

| <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                          |

- 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                          |
| 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<br>or equivalent) | mg/L | 0.10  |
| Phenols                                | µg/L | 1.0   |

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

| <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<br>(total) | µg/L        | 5.30                          |
| Lindane                     | µg/L        | 0.47                          |
| Methylene chloride          | µg/L        | 47.0                          |
| Trichloroethylene           | µg/L        | 29.0                          |

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

| <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  |

where:

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

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

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

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

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

NA = Not Applied

(Source: Amended at 36 Ill. Reg. 18871, effective December 12, 2012)

### **Section 302.510 Incorporations by Reference**

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

American Public Health Association et al., Standard Methods for the Examination of Water and Wastewater, 21<sup>st</sup> Edition, 2005. Available from the American Public Health Association, 800 I Street, NW, Washington, D.C. 20001-3710, (202)777-2742.

USEPA. United States Environmental Protection Agency, Office of Health and Environmental Assessment, Washington, D.C. 20460, Method OIA-1677, DW: Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry, January 2004, Document Number EPA-821-R-04-001.

- b) The Board incorporates the following federal regulations by reference. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, (202) 783-3238:

40 CFR 136 (1996)

40 CFR 141 (1988)

40 CFR 302.4 (1988)

The Sections of 40 CFR 132 (1996) listed below:

Appendix A

Section I A

Section II

Section III C

Section IV D, E, F, G, H, and I

Section V C

Section VI A, B, C, D, E, and F

Section VIII

Section XI

Section XVII

Appendix B

Section III

Section VII B and C

Section VIII

Appendix C

Section II

Section III A (1 through 6 and 8), B (1 and 2)

Appendix D

Section III C, D, and E

Section IV

- c) This Section incorporates no future editions or amendments.

(Source: Amended at 36 Ill. Reg. 18871, effective December 12, 2012)

### **Section 302.553 Determining the Lake Michigan Aquatic Toxicity Criteria or Values – General Procedures**

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

- a) Tier I criteria and Tier II values to protect against acute effects in aquatic organisms will be calculated according to procedures listed at Sections 302.555, 302.560 and 302.563. The procedures of Section 302.560 shall be used as necessary to allow for interactions with other water quality characteristics such as hardness, pH, temperature, etc. Tier I criteria and Tier II values to protect against chronic effects in aquatic organisms shall be calculated according to the procedures listed at Section 302.565.
- b) Minimum data requirements. In order to derive a Tier I acute or chronic criterion, data must be available for at least one species of freshwater animal in at least eight different families such that the following taxa are included:
  - 1) The family Salmonidae in the class Osteichthyes;
  - 2) One other family in the class Osteichthyes;
  - 3) A third family in the phylum Chordata;
  - 4) A planktonic crustacean;
  - 5) A benthic crustacean;
  - 6) An insect;
  - 7) A family in a phylum other than Arthropoda or Chordata; and
  - 8) A family from any order of insect or any phylum not already represented.
- c) Data for tests with plants, if available, must be included in the data set.
- d) If data for acute effects are not available for all the eight families listed above, but are available for the family Daphnidae, a Tier II value shall be derived according to procedures in Section 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 Section 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 Section

302.565. If three ACRs are not available, then a Tier II chronic value can be derived according to procedures in Section 302.565(b).

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

(Source: Amended at 36 Ill. Reg. 18871, effective December 12, 2012)

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

- a) The Agency shall maintain a listing of toxicity criteria and values derived pursuant to this Subpart. This list shall be made available to the public and updated whenever a new criterion or value is derived and shall be published when updated in the Illinois Register.
- b) A criterion or value published pursuant to subsection (a) of this Section may be proposed to the Board for adoption as a numeric water quality standard.
- c) The Agency shall maintain for inspection all information including, but not limited to, assumptions, toxicity data and calculations used in the derivation of any toxicity criterion or value listed pursuant to subsection (a) of this Section until adopted by the Board as a numeric water quality standard.

(Source: Amended at 36 Ill. Reg. 18871, effective December 12, 2012)

#### **Section 302.648 Determining the Human Threshold Criterion**

The HTC is calculated according to the equation:

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

where:

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

ADI = Acceptable daily intake of substance in milligrams per day (mg/d) as specified in Section 302.645;

- W = Per capita daily water consumption equal to 2 liters per day (L/d) for surface waters at the point of intake of a public or food processing water supply, or equal to 0.01 liters per day (L/d) which represents incidental exposure through contact or ingestion of small volumes of water while swimming or during other recreational activities for areas which are determined to be public access areas pursuant to Section 302.102 (b)(3), or 0.001 liters per day (L/d) for other General Use 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 Sections 302.660 through 302.666.

(Source: Amended at 36 Ill. Reg. 18871, effective December 12, 2012)

### **Section 302.657 Determining the Human Nonthreshold Criterion**

The HNC is calculated according to the equation:

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

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 Section 302.654;
- W = Per capita daily water consumption equal to 2 liters per day (L/d) for surface waters at the point of intake of a public or food processing water supply, or equal to 0.01 liters per day (L/d) which represents incidental exposure through contact or ingestion of small volumes of water while swimming or during other recreational activities for areas which are determined to be public access areas pursuant to Section 302.102(b)(3), or 0.001 liters per day (L/d) for other General Use 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 Section 302.663.

(Source: Amended at 36 Ill. Reg. 18871, effective December 12, 2012)

**Section 302.669 Listing of Derived Criteria**

- a) The Agency shall develop and maintain a listing of toxicity criteria pursuant to this Subpart. This list shall be made available to the public and updated whenever a new criterion is derived and shall be published when updated in the Illinois Register.
- b) A criterion published pursuant to subsection (a) may be proposed to the Board for adoption as a numeric water quality standard.
- c) The Agency shall maintain for inspection all information including, but not limited to, assumptions, toxicity data and calculations used in the derivation of any toxicity criterion listed pursuant to subsection (a) until adopted by the Board as a water quality standard.

(Source: Amended at 36 Ill. Reg. 18871, effective December 12, 2012)