# Chapter NR 106

# PROCEDURES FOR CALCULATING WATER QUALITY BASED EFFLUENT LIMITATIONS FOR POINT SOURCE DISCHARGES TO SURFACE WATERS



**Note:** Corrections made under s. 13.93 (2m) (b) 7., Stats., Register, August, 1997, No. 500.

## Subchapter I — Applicability

**NR 106.01 Purpose.** One purpose of this chapter is to specify how the department will calculate water quality based effluent limitations under s. 283.13 (5), Stats., for toxic and organoleptic substances and whole effluent toxicity. The other purpose of this chapter is to specify how the department will decide if and how these limitations will be included in Wisconsin pollution discharge elimination system (WPDES) permits. Water quality based effluent limitations for toxic and organoleptic substances are needed to assure attainment and maintenance of surface water quality standards as established in accordance with s. 281.15 (1), Stats., and as set forth in chs. NR 102 to 105.

**History:** Cr. Register, February, 1989, No. 398, eff. 3-1-89; correction made under s. 13.93 (2m) (b) 7., Stats., Register October 2002 No. 562.

**NR 106.02 Applicability.** The provisions of this chapter are applicable to point sources which discharge wastewater containing toxic or organoleptic substances to surface waters of the state.

**History:** Cr. Register, February, 1989, No. 398, eff. 3-1-89.

**NR 106.03 Definitions.** The following definitions are applicable to terms used in this chapter.

**(1g)** "AMZ" means acute mixing zone concentration based on presence of a zone of initial dilution under s. NR 106.06 (3) (c).

**(1r)** "Bioaccumulative chemical of concern" or "BCC" means any substance that has the potential to cause adverse effects which, upon entering the surface waters, accumulates in aquatic organisms by a human health or wildlife bioaccumulation factor greater than 1000.

**(2)** "Biologically based design flow" means a receiving water design flow to protect fish and aquatic life for which both the du-

ration of exposure is expressed in days and the allowable frequency of excursion is expressed in years. An example of a biologically based design flow is a 4-day 3-year design flow which corresponds to the lowest 4-day average flow that will limit excursions from any water quality criteria or secondary values to no more than once in 3 years.

**(2m)** "Deficiency toxicity" means a condition that exists when adverse effects occur to aquatic organisms because concentrations of common ions are too low.

**Note:** Changes in the concentration of ions in surrounding waters can cause organisms to expend too much energy trying to regulate the balance of water and dissolved materials in bodily fluids, and may result in death.

**Note:** Examples of common ions are sodium, calcium, magnesium, potassium, etc.

**(3)** "Dynamic models" means computer simulation models which use real or derived time series data to predict a time series of observed or derived receiving water concentrations. Methods include continuous simulation, Monte Carlo simulations, or other similar statistical or deterministic techniques.

**(4)** "$EC_{50}$" means the point estimate of the concentration of a toxic substance, wastewater effluent or other aqueous mixture which causes an adverse effect including mortality to 50% of the exposed organisms in a given time period, when compared to an appropriate control.

**(4g)** "Great Lakes" means the open Wisconsin waters of Lake Superior, Lake Michigan, Green Bay, and Chequamegon Bay, as well as adjoining open waters that exhibit characteristics of Lake Superior, Lake Michigan, Green Bay, and Chequamegon Bay, or in other ways are determined by the department to be equivalent to these waters.

**(4r)** "Great Lakes system" means all the surface waters within the drainage basin of the Great Lakes.

**(5)** "IC25" means the point estimate of the concentration of a toxic substance, wastewater effluent or other aqueous mixture that would cause a 25% reduction in a nonlethal biological measurement, such as reproduction or growth, of the exposed test organisms in a given time period.

**(5m)** "IC50" means the point estimate of the concentration of a toxic substance, wastewater effluent or other aqueous mixture that would cause a 50% reduction in a nonlethal biological measurement, such as reproduction or growth, of the exposed test organisms in a given time period.

**(6)** "IWC" or "Instream waste concentration" means an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The IWC is calculated according to the following equation:

$$\mathrm{IWC\,(as\,\%)} = 100 \times \frac{Q_e}{(1-f)Q_e + Q_s}$$

where:

$Q_e$ = effluent flow

f = fraction of the $Q_e$ withdrawn from the receiving water

$Q_s$ = receiving water flow (in most cases ¼ of a low flow value, such as the $Q_{7,10,}$ is used in order to allow a free zone of passage for aquatic organisms).

**(7)** "$LC_{50}$" means the point estimate of the concentration of a toxic substance, wastewater effluent or other aqueous mixture which is lethal to 50% of the exposed organisms in a given time period, when compared to an appropriate control.

**(8)** "Limit of detection" or "LOD" means the lowest concentration level that can be determined to be significantly different from a blank for that analytical test method and sample matrix.

**(9)** "Limit of quantitation" or "LOQ" means the concentration of an analyte at which one can state with a degree of confidence for that analytical test method and sample matrix that an analyte is present at a specific concentration on the sample tested.

**(11m)** "Same waterbody" means hydrologically connected waters of the State with similar water quality characteristics in which a pollutant can travel between in a reasonable period of time without significantly changing chemically or physically. Hydrological connections can include surface and groundwater connections.

**(12)** "Toxicity test" means a test which determines the toxicity of a chemical substance, wastewater effluent or other aqueous mixture using living organisms. A toxicity test measures the degree of response of exposed test organisms to a chemical substance, wastewater effluent or other aqueous mixture.

**(13)** "TUa" or "toxic unit acute" means a value that is equal to 100 divided by the LC50 except as provided in s. NR 106.08 (6) (d).

**(13m)** "TUc" or "toxic unit chronic" means a value that is equal to 100 divided by the IC25 or the IC50 except as provided in s. NR 106.08 (6) (d).

**(14)** "Whole effluent toxicity" or "WET" means the aggregate toxic effect of an effluent as measured directly by a toxicity test.

**History:** Cr. Register, February, 1989, No. 398, eff. 3-1-89; r. (7), renum. (1) to (6), (8) and (9) to be (4), (7) to (9), (12) and (14) and am. (2), (4), (7) and (12), cr. (1), (5), (6), (10), (11) and (13), Register, August, 1997, No. 500, eff. 9-1-97; CR 09-123: r. and recr. (6) Register July 2010 No. 655, eff. 8-1-10; CR 15-084: cr. (4g), (4r), (11m) Register August 2016 No. 728, eff. 9-1-16; CR 15-085: renum. (1) to (1r), cr. (1g), (2m), (5m), r. (10), (11), am. (13), cr. (13m), am. (14) Register August 2016 No. 728, eff. 9-1-16.

## Subchapter II — General Procedures for Effluent Limitations

**NR 106.04 General. (1)** The department shall establish water quality-based effluent limitations whenever categorical effluent limits required under s. 283.13, Stats., are less stringent than necessary to achieve applicable water quality standards specified in chs. NR 102 to 105. Water quality-based effluent limitations for a point source shall be specified in the permit for that point source.

**(2)** In no case may the water quality based effluent limitations be less stringent than applicable categorical effluent limitations.

**(3)** The department shall establish limitations for toxic and organoleptic substances if any of the conditions specified in s. NR 106.05 are met. Limitations shall be established according to the methods provided in s. NR 106.06 and included in WPDES permits according to the conditions provided in s. NR 106.07. The department shall establish limitations for whole effluent toxicity if any of the conditions specified in s. NR 106.08 are met. Whole effluent limitations shall be established and included in WPDES permits according to the methods provided in ss. NR 106.08 and 106.09.

**(3m)** In lieu of imposing limitations at the point of discharge when imposition of limitations at the point source discharge location is impracticable or infeasible, the department may impose water quality-based effluent limitations on an internal waste stream before that waste stream mixes with other waste streams or cooling water streams. Monitoring requirements as specified in s. NR 106.07 (1) shall also be applied to the internal waste streams in these instances.

**(4)** Water quality based effluent limitations or monitoring requirements for toxic or organoleptic substances or whole effluent toxicity may be removed from a permit, subject to public notice and opportunity for hearing under ch. NR 203, if the limitation is determined to be unnecessary based on the procedures presented

in this chapter or based on other information available to the department.

**(5)** For purposes of this chapter, a cost-effective pollutant minimization program is an activity which has as its goal the reduction of all potential sources of the pollutant for the purpose of maintaining the effluent at or below the water quality based effluent limitation. The pollutant minimization programs specified in ss. NR 106.05 (8), 106.06 (6) (d), 106.07 (6) (f) and 106.145 (7) shall include investigation of treatment technologies and efficiencies, process changes, wastewater reuse or other pollution prevention techniques that are appropriate for that facility, taking account of the permittee's overall treatment strategies, facilities plans and operational circumstances. Past documented pollution prevention or treatment efforts may be used to satisfy all or part of a pollution minimization program requirement. The permittee shall submit to the department an annual status report on the progress of a pollutant minimization program.

**History:** Cr. Register, February, 1989, No. 398, eff. 3-1-89; am. (3), cr. (5), Register, August, 1997, No. 500, eff. 9-1-97; CR 02-019: am. (5) Register October 2002 No. 562, eff. 11-1-02; CR 15-085: am. (1) (intro.), cr. (3m) Register August 2016 No. 728, eff. 9-1-16.

**NR 106.05 Determination of the necessity for water quality based effluent limitations for toxic and organoleptic substances. (1)** (a) *General.* The department shall establish water quality based effluent limitations for point source dischargers whenever the discharges from those point sources contain(s) toxic or organoleptic substances at concentrations or loadings which do not, as determined by any method in this section, meet applicable water quality standards specified in chs. NR 102 to 105.

(b) *Determining necessity for limitations based on secondary values.* The department may establish water quality based effluent limitations for point source discharges based on secondary values calculated according to ch. NR 105. The department shall calculate secondary values and establish limitations for toxic and organoleptic substances in permits based on secondary values when, in the judgment of the department, one or more of the following factors support the necessity for the values, in conjunction with the procedures in subs. (2) to (8).

1. Whole effluent toxicity or other biomonitoring or bioassay test results indicate toxicity to test or other species.

2. The use designation of the receiving water is or may be impaired.

3. There is other information that the industrial category or subcategory of the point source or the industrial or other sources discharging to a publicly owned treatment works discharges the substance.

4. The substance in the wastewater will not be adequately removed or reduced by the type of wastewater treatment provided.

5. The ecological or environmental risk from the substance may be significant when discharged to surface waters.

6. Other relevant factors which may cause an adverse effect on surface waters as specified in s. NR 105.04 (1).

(c) If the department determines that a limitation based on an aquatic life acute or chronic secondary value should be established in a permit according to the provisions in this section, a permittee may request an alternative WET limit in accordance with s. NR 106.07 (7).

**Note:** A toxic or organoleptic substance includes, but is not limited to, those substances in Table 6 of 40 CFR part 132.

**(2)** When considering the necessity for water quality based effluent limitations, the department shall consider in-stream biosurvey data and data from ambient toxicity analyses whenever such data are available.

**(3)** If representative discharge data are available for a toxic or organoleptic substance being discharged from a point source, limitations shall be established in accordance with any one of the following conditions:

(a) The discharge concentration of the substance for any day exceeds the limit of detection and exceeds the limitations based on either the acute toxicity criterion or secondary acute value for the substance as determined in s. NR 106.06 (3) where appropriate,

(b) The arithmetic average discharge concentration of the substance for any 4 consecutive days calculated as described in sub. (7) exceeds the limit of detection and exceeds the limitations based on either the chronic toxicity criterion or secondary chronic value for the substance as determined in s. NR 106.06 (4).

(c) The arithmetic average discharge concentration of the substance for any 30 consecutive days calculated as described in sub. (7) exceeds the limit of detection and exceeds any limitation based on the wildlife, human threshold, or human cancer criteria or secondary values, or taste and odor criteria for the substance as determined in s. NR 106.06 (4).

**(4)** If at least 11 daily discharge concentrations of the substance are greater than the limit of detection and the requirements of sub. (3) do not result in the need for an effluent limitation, water quality based effluent limitations are necessary for a substance in a point source discharge if the upper 99th percentile of available discharge concentrations as calculated in sub. (5) meets any of the conditions specified in pars. (a) to (c).

(a) The upper 99th percentile of daily discharge concentrations of the substance exceeds the limitation based on either the acute toxicity criterion or the secondary acute value for the substance as determined in s. NR 106.06 (3).

(b) The upper 99th percentile of 4-day average discharge concentration of the substance exceeds the limitation based on either the chronic toxicity criterion or the secondary chronic value for the substance as determined in s. NR 106.06 (4), or

(c) The upper 99th percentile of 30-day average discharge concentration of the substance exceeds any limitation based on the wildlife, human threshold, or human cancer criteria or secondary value, or taste and odor criteria for the substance as determined in s. NR 106.06 (4).

**(5)** This subsection shall be used to calculate upper 99th percentile values unless a probability distribution other than log normal is determined to be more appropriate and alternate methods to calculate the upper 99th percentile are available.

(a) When available daily discharge concentrations of the substance are not serially correlated and at least 11 concentrations are greater than the limit of detection, the upper 99th percentile of the daily average, the 4-day average and the 30-day average discharge concentrations may be calculated as follows:

$$P_{99} = \exp(mu_{dn} + Z_p sigma_{dn})$$

Where:

$P_{99}$ = Upper 99th percentile of n-day average discharge concentrations.

d = Ratio of the number of daily discharge concentrations less than the limit of detection to the total number of discharge concentrations.

n = Number of discharge concentrations used to calculate an average over a specified monitoring period (n=1 for daily concentrations,4 for 4-day averages and 30 for 30-day averages).

exp = Base e (or approximately 2.718) raised to the power shown between the parentheses in the original equation.

$Z_p$ = Z value corresponding to the upper $p^{th}$ percentile of the standard normal distribution.

P = $(0.99\text{-}d^n)/(1\text{-}d^n)$.

$mu_{dn}$ = $mu_d+[(sigma_d)^2 -(sigma_{dn})^2]/2+ln[(1\text{-}d)/(1\text{-}d^n)]$ = estimated log mean of n-day average discharge concentrations greater than the limit of detection. (Note: $mu_{dn} = mu_d$ if n = 1).

$(sigma_{dn})^2$ = $1n [(1\text{-}d^n) ([1+(s/m)^2]/[n(1\text{-}d)]+ (n\text{-}1)/n)]$ = estimated log variance of n-day average discharge concentrations greater than the limit of detection. (Note: $(sigma_{dn})^2= (sigma_d)^2$ if n = 1.)

$mu_d$ = $1n\ m - 0.5\ (sigma_d)^2$ = estimated log mean of discharge concentrations greater than the limit of detection.

$(sigma_d)^2$ = $1n [1 + (s/m)^2]$ = estimated log from variance of discharge concentrations greater than the limit of detection.

1n = Natural logarithm.

m = Mean of discharge concentrations greater than the limit of detection.

s = Standard deviation of discharge concentrations greater than the limit of detection.

(b) When the daily discharge concentrations of any substance are serially correlated, the serially correlated data may be adjusted using appropriate methods such as that presented in Appendix E of "Technical Support Document for Water Quality-based Toxics Control", U.S. environmental protection agency, March 1991 (EPA/505/2-90-001). The equation presented in par. (a) may be used after adjustment of the serially correlated data.

**(6)** If less than 11 daily discharge concentrations of the substance are greater than the limit of detection, and the requirements in sub. (3) do not result in an effluent limitation, water quality based effluent limitations are necessary for a substance in a point source discharge if the arithmetic average of available discharge concentrations as calculated in sub. (7) exceeds any value determined in par. (a) or (b):

(a) One fifth of the limitation based on the acute toxicity criterion or secondary acute value for the substance, as determined in s. NR 106.06 (3) where appropriate, or

(b) One fifth of any limitation based on chronic toxicity criteria or secondary chronic values or long-term impacts as determined in s. NR 106.06 (4).

**(7)** The arithmetic average discharge concentration as used in subs. (3) and (6) shall be calculated using all available discharge data treated according to this subsection.

(a) If, in the judgment of the department, the analytical methods used to test for the substance represent acceptable methods, all values reported as less than the limit of detection shall be set equal to zero for calculation of the average concentration.

(b) If, in the judgment of the department, the analytical methods used to test for the substance do not represent the best acceptable methods, all values reported as less than the limit of detection shall be discarded from the data.

**(8)** If representative discharge data are not available for a substance, the department may include water quality-based effluent limitations in a permit if, in the judgment of the department, water quality standards will be exceeded if the discharge of the substance is not limited.

**(9)** Regardless of the results of the analysis conducted under this section, the department may, whenever determined necessary, require monitoring for any toxic or organoleptic substance.

**History:** Cr. Register, February, 1989, No. 398, eff. 3-1-89; renum. (1) to be (1) (a), cr. (1) (b) and (c), am. (3) (a) to (c), (4) (a) to (c), (5) (b), (6) (a) and (b) and (8), Register, August, 1997, No. 500, eff. 9-1-97; CR 03-050: am. (5) (a) Register February 2004 No. 578, eff. 3-1-04; CR 09-123: am. (5) (a) Register July 2010 No. 655, eff. 8-1-10; CR 15-085: am. (1) (c), r. and recr. (8) Register August 2016 No. 728, eff. 9-1-16.

## NR 106.06 Calculation of water quality based effluent limitations for toxic and organoleptic substances.

**(1)** BASIS FOR LIMITATIONS. (a) The department shall establish water quality based effluent limitations for point source dischargers whenever such limitations are necessary, as determined by any method in this section, to meet the applicable water quality standards, criteria and secondary values as determined in chs. NR 102 to 105.

(b) 1. Water quality based effluent limitations for toxic and organoleptic substances shall be determined to attain and maintain water quality standards and criteria or secondary values, specified in or determined according to procedures in ch. NR 105, at the point of discharge. Effluent limitations shall be established to protect downstream waters whenever the department has information to make the determinations.

2. For discharges to Green Bay that are north of 44° 32' 30" north latitude, the cold water community criteria shall apply in effluent limit calculations. For discharges to Green Bay that are south of 44° 32' 30" north latitude, effluent limitations shall be established in accordance with subd. 1.

**(2)** LIMITATIONS FOR BIOACCUMULATIVE CHEMICALS OF CONCERN (BCCS). (am) In this subsection, the following definitions apply:

1. "New discharge" means any discharge from a point source that first received WPDES permit coverage from the department after November 6, 2000. "New discharge" does not include a discharge from a publicly owned treatment works if the discharge from the treatment works is caused by a project that is correcting or preventing a public health problem.

2. "Existing discharge" means any discharge from a point source that currently has a WPDES permit and that has continually had WPDES permit coverage since November 6, 2000 or earlier. "Existing discharge" includes a discharge from a publicly owned treatment works that becomes permitted after November 6, 2000 if the discharge from the treatment works is caused by a project that is correcting or preventing a public health problem.

3. "Expanded portion of an existing discharge" means any increase in concentration, level, or loading of a BCC, which would exceed a limitation specified in a current WPDES permit, or which according to the procedures in s. NR 106.05, would result in the establishment of a new limitation in a reissued or modified WPDES permit. "Expanded portion of an existing discharge" does not include an expanded discharge from a publicly owned treatment works if the expanded discharge from the treatment works is caused by a project that is correcting or preventing a public health problem.

**Note:** An example of a project that is preventing or correcting a public health problem is a situation where a community with failing septic systems connects to a POTW, as defined in s. NR 106.59, to avert a potential public health threat from the failing systems.

(bg) Notwithstanding any other provisions in chs. NR 102 and 106, mixing zones may not be used for effluent limitations for new discharges of BCCs or for the expanded portion of an existing discharge of BCCs into the Great Lakes system. Effluent limitations for new discharges of BCCs and for expanded portions of

existing discharges shall equal the most stringent applicable water quality criterion or secondary value for the BCC. Effluent limitations for an expanded portion of an existing discharge of BCCs shall be determined by means of a mass balance where the limitation for the existing portion of a permitted discharge that meets the provisions of par. (br) 1. or 2. shall be determined using the requirements of sub. (4) and the limitation for any expanded portion of the discharge may not exceed the most stringent criterion or value for that BCC.

(br) Effluent limitations for existing discharges of BCCs into the Great Lakes system may not include a mixing zone or exceed the most stringent applicable water quality criteria or secondary values for BCCs, except as provided under subd. 1. or 2.

1. Water conservation. A mixing zone may be granted and an effluent limitation may exceed the most stringent water quality criterion or secondary value for a discharged BCC if the permittee demonstrates in the permit application that failure to grant a mixing zone for the BCC would preclude water conservation measures that would lead to an overall load reduction of the BCC, even though a higher concentration of the BCC occurs in the effluent.

2. Technical and economic considerations. A mixing zone may be granted and an effluent limitation may exceed the most stringent water quality criterion or secondary value for the discharged BCC, if the permittee demonstrates and the department concurs that all the following conditions are met:

a. For the BCC discharged, the permittee is in compliance with and will continue to comply with the WPDES permit requirements and this chapter.

b. The permittee has reduced and will continue to reduce loadings of the BCC for which a mixing zone is requested to the maximum extent possible, such that any additional controls or pollution prevention measures to reduce or ultimately eliminate the BCC discharged would result in unreasonable economic effects on the discharger or the affected community because the controls or measures are not feasible or cost-effective.

3. Approval Requirements. If the department approves a mixing zone for a BCC under this paragraph, the following requirements shall be met:

a. The approved mixing zone is no larger than necessary to account for the technical constraints and economic effects identified under subd. 2.

b. All water quality criteria or secondary values for the BCC shall be met at the edge of an approved mixing zone or be consistent with the applicable U.S. environmental protection agency (EPA) approved total maximum daily load (TMDL).

c. The permit shall contain a numeric effluent limitation for the BCC, determined using the requirements of sub. (4) and the limit shall not be less stringent than the limit that was effective on November 6, 2000.

d. The permit shall include requirements for an ambient water quality monitoring plan if the department determines these requirements are appropriate to ensure compliance with water quality criteria and consistency with any applicable TMDL.

e. The permit shall include requirements for an evaluation of alternative means for reducing the BCC from other sources in the watershed if the department determines these requirements are appropriate to ensure compliance with water quality criteria and consistency with any applicable TMDL.

f. Any mixing zone for a BCC approved by the department pursuant to this paragraph shall be limited to one permit term unless the permittee applies for a mixing zone approval at the next reissuance and the department approves the mixing zone in the subsequent permit applications in accordance with the requirements of this paragraph.

g. The corresponding permit fact sheet for an approved mixing zone shall specify the mixing provisions used in calculating the permit limits and shall identify each BCC for which a mixing zone is approved.

(c) Effluent limitations for discharges of BCCs into waters of the Great Lakes system as defined in s. NR 102.12 that are based on human health criteria or secondary values calculated according to procedures in ch. NR 105, shall be also based on the most protective designated use: cold water, public water supply.

**(3)** LIMITATIONS BASED ON ACUTE TOXICITY. (a) The department shall establish water quality based effluent limitations to ensure that substances are not present in amounts which are acutely harmful to animals, plants or aquatic life in all surface waters including those portions of the mixing zone normally habitable by aquatic life and effluent channels as required by s. NR 102.04 (1).

(b) To assure compliance with par. (a), the department shall calculate the water quality-based effluent limitation for a substance using the following procedures whenever the background concentration of the substance in the receiving water is less than the acute water quality criterion or secondary value:

1. A limitation shall be calculated using the following conservation of mass equation whenever sufficient site-specific data exist:

$$\text{Limitation} = \frac{(WQC)\,(Qs+(1-f)Qe) - (Qs- fQ_e)\,(Cs)}{Qe}$$

Where:

| | | |
|---|---|---|
| Limitation | = | Calculated limitation based on the acute toxicity criterion or secondary acute value (in units of mass per unit of volume). |
| WQC | = | The acute toxicity criterion appropriate for the receiving water as specified in chs. NR 102 to 105 or the secondary acute value determined according to ch. NR 105 or as referenced in sub. (1) (a) |
| $Q_s$ | = | Receiving water design flow (in units of volume per unit time) under par. (bm) |
| $Q_e$ | = | Effluent flow (in units of volume per unit time) as specified in s. NR 106.06 (4) (d) |
| f | = | Fraction of the effluent flow that is withdrawn from the receiving water, and |
| $C_s$ | = | Background concentration of the substance (in units of mass per unit volume) as specified in s. NR 106.06 (4) (e). |

2. A limitation shall be calculated equal to the final acute value or secondary value as determined in s. NR 105.05 for the respective fish and aquatic life subcategory for which the receiving water is classified.

3. The department shall use the more restrictive calculated effluent limitation derived in subds. 1. and 2. as the water quality-based effluent limitation. If the background concentration of the substance in the receiving water is greater than the acute water quality criterion or secondary value for the substance, then the procedure in sub. (6) shall be used to calculate the limitation.

(bm) The value of Qs of the receiving water for calculating effluent limitations in par. (a) based upon the acute fish and aquatic life criteria or secondary values developed according to ch. NR 105 shall be determined on a case-by-case basis. In no case may the Qs exceed the average minimum 1-day flow which occurs

once in 10 years (1-day Q10) or if the 1-day Q10 flow data is not available, 80% of the average minimum 7-day flow that occurs once in 10 years (7-day Q10).

(c) Except as provided in sub. (2), water quality-based effluent limitations as derived in par. (b) may exceed the final acute value or the secondary acute value within a zone of initial dilution provided that the acute toxicity criteria or secondary acute values are met within a short distance from the point of discharge. A zone of initial dilution shall only be approved if the discharger demonstrates to the department that mixing of the effluent with the receiving water in the zone of initial dilution is rapid and all the following conditions are met:

1. The discharge is not at the water surface or at the shoreline.

2. The discharge does not constitute a significant portion of the streamflow or otherwise dominate the receiving water.

3. The discharge velocity is not less than 3 meters per second (10 feet per second) unless an alternative discharge velocity, which similarly minimizes organism exposure time, is determined appropriate for the specific site.

4. The acute toxicity criteria or secondary acute values shall be met within 10% of the distance from the edge of the outfall structure to the edge of a mixing zone which may be determined in accordance with s. NR 102.05 (3).

5. The acute toxicity criteria or secondary acute values shall be met within a distance of 50 times the discharge length scale in any direction. The discharge length scale is defined as the square root of the cross-sectional area of any discharge outlet. If a multiport diffuser is used, the requirement in this subdivision shall be met for each port using the appropriate discharge length scale for that port.

6. The acute toxicity criteria or secondary acute values shall be met within a distance of 5 times the local water depth in any horizontal direction from any discharge outlet. The local water depth is defined as the natural water depth (existing prior to the installation of the discharge outlet) prevailing under the mixing zone design conditions for the site.

(d) For toxic substances with water quality criteria related to one or more other water quality parameters, effluent limitations shall be calculated using the effluent value for the water quality parameter. Water quality parameters include, but are not limited to, pH, temperature and hardness.

(e) The department shall use the methodology in s. NR 106.07 (3) to (5) to express water quality-based effluent limitations derived in this subsection as permit effluent limitations.

**(4)** LIMITATIONS BASED ON CHRONIC TOXICITY OR LONG-TERM IMPACTS. (a) *Water quality criteria and secondary values.* The department shall calculate water quality based effluent limitations to ensure that the chronic toxicity criteria (CTC), the wildlife criteria (WC), the taste and odor criteria (TOC), the human threshold criteria (HTC), and human cancer criteria (HCC) appropriate for the receiving water as specified in chs. NR 102 to 105 and the secondary chronic values determined according to ch. NR 105 will be met after dilution with an appropriate allowable quantity of receiving water flow as specified in this subsection, subs. (5) to (11) and s. NR 106.11. The available dilution shall be determined according to par. (c) unless the conditions specified in s. NR 102.05 (3) or sub. (2) require less dilution or no dilution be allowed. Effluent limitations for substances for which criteria may be expressed as dissolved concentrations may be established according to sub. (7).

(b) *Calculation of limits.* Water quality based effluent limitations to meet the requirements of this subsection shall be calculated using the procedure specified in subd. 1. or 2., except as provided in sub. (2) or (6).

1. For discharges of toxic or organoleptic substances to flowing receiving waters, the water quality based effluent limitation for a substance shall be calculated using the following conservation of mass equation whenever the background concentration is less than the water quality criterion or secondary value:

$$\text{Limitation} = \frac{(WQC)\,(Qs+(1-f)Qe) - (Qs- fQ_s)\,(Cs)}{Qe}$$

Where:

| | | |
|---|---|---|
| Limitation | = | Water quality based effluent limitation (in units of mass per unit of volume), |
| WQC | = | The water quality criterion or secondary value concentration (in units of mass per unit volume) as referenced in sub. (1) or par. (a) |
| $Q_s$ | = | Receiving water design flow (in units of volume per unit time) as specified in par. (c) |
| $Q_e$ | = | Effluent flow (in units of volume per unit time) as specified in par. (d) |
| f | = | Fraction of the effluent flow that is withdrawn from the receiving water, and |
| $C_s$ | = | Background concentration of the substance (in units of mass per unit volume) as specified in par. (e). |

**Note:** In applying this equation, all units for the flow and concentration parameters respectively, shall be consistent.

2. For discharges of toxic or organoleptic substances to receiving waters which do not exhibit a unidirectional flow at the point of discharge, such as lakes or impoundments, the department may calculate, in the absence of specific data, water quality based effluent limitations using the following equation whenever the background concentration is less than the water quality criterion or secondary value:

$$\text{Limitation} = 11\,(WQC) - 10C_s$$

Where:

| | | |
|---|---|---|
| Limitation | = | Water quality based effluent limitation (in units of mass per unit of volume) |
| WQC | = | The water quality criterion concentration or secondary value (in units of mass per unit volume) as referenced in sub. (1) or par. (a). |
| Cs | = | Background concentration of the substance (in units of mass per unit volume) as specified in par. (e). |

On a case-by-case basis other dilutional factors may be used, but in no case may the dilution allowed exceed an area greater than the area where discharge induced mixing occurs. The discharge is also subject to the conditions specified in s. NR 102.05 (3). The discharger may be required to determine the size of the mixing zone using acceptable models or dye studies.

3. The limitation calculated in subd. 1. or 2. may be converted to a maximum load limitation by multiplying the calculated concentration limitation by the rate of effluent flow as determined in par. (d) and appropriate conversion factors.

(c) *Receiving water design flow (Qs).* The value of $Q_s$ to be used in calculating the effluent limitation for discharges to flowing waters shall be determined as follows:

1. The department shall make reasonable efforts to deter-

mine the area of the zone of passage and the dilution characteristics of discharges.

2. The department may require that the discharger provide information on the discharge mixing and dilution characteristics of discharges.

3. The discharger shall be allowed to demonstrate, through appropriate and reasonable methods that an adequate zone of free passage exists in the cross-section of the receiving water or that dilution is accomplished rapidly such that the extent of the mixing zone is minimized. In complex situations, the department may require that the demonstration under this subdivision include water quality modeling or field dispersion studies.

4. Following the determinations under subds. 1. to 3., the value of $Q_s$ of the receiving water for calculating effluent limitations based upon the chronic toxicity criteria specified in s. NR 105.06 or secondary chronic values shall be determined on a case-by-case basis. In no case may $Q_s$ exceed the larger of the average minimum 7-day flow which occurs once in 10 years (7-day $Q_{10}$) or, if sufficient information is available to calculate a biologically based receiving water design flow, the flow which prevents an excursion from the criterion or secondary value using a duration of 4 days and a frequency of less than once every 3 years (4-day, 3-year biological flow).

5. If the requirements of subds. 2. and 3. are not satisfied, the department shall notify the permittee and identify the deficiencies and allow additional time, if necessary, to complete the demonstration. If the demonstration cannot be completed satisfactorily, the value of $Q_s$ of the receiving water for calculating effluent limitations based upon the chronic toxicity criteria specified in s. NR 105.06 or secondary chronic values shall equal 1/4 of the 7-day $Q_{10}$ or $^1/_4$ of the 4-day, 3 year biological flow. In no case may the value of $Q_s$, of the receiving water, for calculating effluent limitations based upon the chronic toxicity criteria or secondary chronic values developed according to ch. NR 105, exceed 1/4 of the 7-day $Q_{10}$ or 1/4 of the 4-day, 3-year biological flow if the department determines that the discharge has a potential to jeopardize the continued existence of any endangered or threatened species listed under ch. NR 27 and conforming to section 7 of the endangered species act, 16 USC 1536.

6. $Q_s$ may be reduced from those values calculated in subds. 3. to 5. where natural receiving water flow is significantly altered by flow regulation.

7. Following the determinations under subds. 1. to 3., the value of $Q_s$ of the receiving water for calculating effluent limitations based upon the wildlife criteria or secondary values developed according to ch. NR 105 shall be determined on a case-by-case basis. In no case may the $Q_s$ exceed the average minimum 90-day flow which occurs once in 10 years (90-day $Q_{10}$) or if the 90-day $Q_{10}$ flow is not available, the average minimum 30-day flow which occurs once in 5 years (30-day $Q_5$) or 85% of the average minimum 7-day flow which occurs once in 2 years (7-day $Q_2$).

8. If the requirements of subds. 2. and 3. are not satisfied, the department shall notify the permittee and identify the deficiencies and allow additional time, if necessary, to complete the demonstration. Except as provided in subd. 12., if the demonstration cannot be completed satisfactorily, the value of $Q_s$ of the receiving water for calculating effluent limitations based upon the wildlife criteria specified in s. NR 105.07 shall equal ¼ of the 90-day $Q_{10}$ or ¼ of the 30-day $Q_5$ or ¼ of 85% of the 7-day $Q_2$. In no case may the value of $Q_5$ of the receiving water, for calculating effluent limitations based upon the wildlife criteria or secondary values developed according to ch. NR 105, exceed ¼ of the 90-day $Q_{10}$ or ¼ of the 30-day $Q_5$ or ¼ of 85% of the 7-day $Q_2$ if the department determines that the discharge has a potential to jeopardize the continued existence of any endangered or threatened species listed under ch. NR 27 and conforming to section 7 of the endangered species act, 16 USC 1536.

9. Except as provided in subd. 12., following the determinations under subds. 1. to 3., the value of $Q_s$ of the receiving water for calculating effluent limitations based upon the human cancer criteria, human threshold criteria or secondary values developed according to ch. NR 105 shall be determined on a case-by-case basis. In no case may $Q_s$ exceed the harmonic mean flow.

10. If the requirements of subds. 2. and 3. are not satisfied, the department shall notify the permittee and identify the deficiencies and allow additional time, if necessary, to complete the demonstration. Subject to subd. 12., if the demonstration cannot be completed satisfactorily, the value of $Q_s$ of the receiving water for calculating effluent limitations based upon the human cancer criteria or secondary values or the human threshold criteria or secondary values specified in ch. NR 105 shall equal ¼ of the harmonic mean flow.

11. Except as provided in subd. 12., the value of $Q_s$ shall equal the mean annual flow of the receiving water for calculating effluent limitations based upon the taste and odor criteria as specified in ch. NR 102.

12. $Q_s$ may be reduced from those values calculated in subds. 9., 10., and 11.,whenever the department determines such discharges may directly affect public drinking water supplies.

(d) *Effluent flows ($Q_e$).* 1. For dischargers subject to ch. NR 210 and which discharge for 24 hours per day on a year-round basis, $Q_e$ shall equal the maximum effluent flow, expressed as a daily average, that is anticipated to occur for 12 continuous months during the design life of the treatment facility unless it is demonstrated to the department that such a design flow rate is not representative of projected flows at the facility.

2. For all other dischargers not subject to ch. NR 210, $Q_e$ shall equal either subd. 2. a. or b. for effluent limitations based on aquatic life chronic criteria or chronic secondary values, and shall equal either subd. 2. a. or c. for effluent limitations based on wildlife, human threshold, human cancer or taste and odor criteria or secondary values. Whenever calculating $Q_e$, the department may consider a projected increase in effluent flow that will occur when production is increased or modified, or another wastewater source, including stormwater, is added to an existing wastewater treatment facility. This subdivision does not waive the requirements of ch. NR 207.

a. The maximum effluent flow, expressed as a daily average, that has occurred for 12 continuous months and represents normal operations; or

b. The maximum effluent flow, expressed as a daily average, that has occurred for 7 continuous days and represents normal operations; or

c. The maximum effluent flow, expressed as a daily average, that has occurred for 30 continuous days and represents normal operations.

3. For seasonal discharges, discharges proportional to stream flow, or other unusual discharge situations, $Q_e$ shall be determined on a case by case basis.

(e) *Background concentrations of toxic or organoleptic substances ($C_s$).* The representative background concentration of a toxic or organoleptic substance shall be used in deriving chemical specific water quality based effluent limitations. Except as provided elsewhere in this paragraph, the representative background concentration shall equal the geometric mean of the acceptable available data for a substance. Background concentrations may

not be measured at a location within the direct influence of a point source discharge.

1. The department shall determine representative background concentrations of toxic substances on a case-by-case basis using available data on the receiving water or similar waterbodies in the state, including acceptable and available caged or resident fish tissue data, available or projected pollutant loading data, and best professional judgment.

2. The department may utilize representative seasonal concentrations and may consider other information on background concentrations submitted to the department.

3. When evaluating background concentration data, commonly accepted statistical techniques shall be used to evaluate data sets consisting of values both above and below the level of detection. When all of the acceptable available data in a data set category, such as water column, caged or resident fish tissue, are below the level of detection for a pollutant, then all the data for that pollutant in that data set shall be assumed to be zero.

(f) The department shall use the methodology in s. NR 106.07 (3) to (5) to express water quality-based effluent limitations derived in this section as permit effluent limitations.

**(5)** VALUES FOR PARAMETERS WHICH AFFECT THE LIMIT. For toxic substances with water quality criteria related to one or more other water quality parameters, the department may calculate effluent limitations in consideration of those other water quality parameters. Water quality parameters include but are not limited to pH, temperature and hardness. The department shall determine the value of the water quality parameters on a case-by-case basis as follows:

(a) *Receiving water.* 1. The geometric mean of available data for the receiving water shall be used, except the arithmetic mean for pH shall be used.

2. Representative seasonal values may be used.

3. If information on the water quality parameters is not available, then information on the quality of similar water bodies in the area and best professional judgment may be used.

4. The receiving water value of the water quality parameter shall be used to determine the effluent limitation. The receiving water value may be modified to account for the mixture of the receiving and effluent flows when any of the following conditions occur:

a. When the value of the water quality parameter in the effluent is significantly greater than or less than the value in the receiving water;

b. When the effluent flow is relatively large in comparison to the receiving water flow used in the calculation of the effluent; or

c. When, as a result of demonstrated or measured physical, chemical or biological reactions, the value of the water quality parameter, after mixing of the receiving water and the effluent, is significantly different than the background value of the water quality parameter in the receiving water.

(b) *Effluent.* 1. The geometric mean of available data for the effluent shall be used, except the arithmetic mean for pH shall be used.

2. If information on the water quality parameters is not available, then values representative of similar effluents may be used.

**(6)** EFFLUENT LIMITATIONS BASED UPON ELEVATED BACKGROUND CONCENTRATIONS. Whenever the representative background concentration for a toxic or organoleptic substance in the receiving water is determined to be greater than any applicable water quality criterion or secondary value for that substance, the calculation of an effluent limitation and the determination of the need for the limitation in a permit shall be performed subject to all of the following:

(a) If the department has developed an EPA approved TMDL for the toxic or organoleptic substance in the receiving water, an effluent limitation for that substance shall be consistent with the TMDL.

(b) If no EPA approved TMDL has been developed and if the intake source of the wastewater is all from the same waterbody as the receiving water of the discharge, the department may determine that the discharge does not have a reasonable potential to cause or contribute to an excursion above the applicable water quality criterion or secondary value for the substance, and may determine that a numeric limitation is not necessary, provided the permittee has demonstrated that all of the following conditions are met:

1. The permittee withdraws 100 percent of the intake water containing the substance from the same waterbody into which the discharge is made.

2. The permittee does not contribute any additional mass of the identified intake substance to its wastewater.

3. The permittee does not alter the identified intake substance chemically or physically in a manner that would cause adverse water quality impacts to occur that would not occur if the substance were left in-stream.

4. The permittee does not contribute to a statically significant increase in the identified intake substance concentration, as determined by the department, at the edge of the mixing zone or at the point of discharge if a mixing zone is not allowed, as compared to the concentration of the substance in the intake water, unless the increased concentration does not cause or contribute to an excursion of water quality standard for that substance.

5. The timing and location of the discharge would not cause adverse water quality impacts to occur that would not occur if the identified intake substance were left in the receiving waterbody.

(c) If no TMDL has been developed and the conditions in par. (b) are not met, an effluent limitation shall be included in the permit if the department determines that the discharge has a reasonable potential to cause or contribute to an excursion above the applicable water quality criterion or secondary value for the substance. The limitation shall be applied as follows:

1. For discharges within the Great Lakes system, the effluent limitation for that substance shall be equal to the most stringent applicable water quality criterion or secondary value.

2. For discharges outside of the Great Lakes system:

a. When all of the intake source of the wastewater is from the same waterbody as the receiving water of the discharge and the permittee has demonstrated that the conditions in par. (b) 3. to 5. are met the effluent limitation for that substance shall equal the representative background concentration of that substance in the receiving water. If the conditions in par. (b) 3. to 5. are not met, the effluent limitation for that substance shall be equal to the most stringent applicable water quality criterion or secondary value for that substance.

b. When all of the intake source of the wastewater is from a waterbody that is different than the receiving water of the discharge, the effluent limitation for that substance shall be equal to the lowest applicable water quality criterion or secondary value.

c. When the intake source of the wastewater is in part from the same waterbody as the receiving water and in part from a different waterbody, the effluent limitation may be derived using subd. 2 .a and b. to reflect the flow-weighted average of each source of the wastewater, provided that adequate monitoring to

determine compliance can be established and is included in the permit.

(d) The determination of representative background concentrations for toxic or organoleptic substances in this subsection shall be statistically ($P \leq 0.01$) or otherwise appropriately determined as the reasonably expected maximum background concentration for that substance.

(e) For purposes of this subsection, an intake pollutant in the source water is considered to be from the same waterbody as the receiving water of the discharge if the permittee successfully demonstrates all of the following to the department:

1. That the pollutant would have reached the outfall point in the receiving water within a reasonable period had it not been withdrawn by the permittee.

2. That the background concentration of the pollutant in the receiving water is at a similar concentration level to that in the intake water.

3. That other water quality characteristics, including temperature, pH and hardness are similar in the intake water and the receiving water.

**Note:** The term "same waterbody" may include a hydrologic connection between groundwater and surface water. See definition in s. NR 106.03 (11m).

**(7)** APPLICABILITY OF WATER QUALITY CRITERIA EXPRESSED AS DISSOLVED CONCENTRATIONS. Effluent limitations may be established in a permit under this subsection based upon the acute and chronic aquatic life toxicity criteria expressed as dissolved concentrations that are determined using the procedures specified in ss. NR 105.05 (5) and 105.06 (8). Effluent limitations for metals calculated under this section shall be expressed as total recoverable in a permit. All of the following shall apply in establishing effluent limitations under this subsection:

(a) Determine the effluent limitations according to the procedures specified in this chapter using the water quality criteria expressed as total recoverable from tables 1 to 6 in ch. NR 105. Determine the necessity for water quality based effluent limitations according to s. NR 106.05. If the procedures in s. NR 106.05 do not result in the need for effluent limitations based upon the total recoverable criteria, then no limitations shall be established in the permit and there is no further review. If the procedures in s. NR 106.05 do result in the need for effluent limitations based upon the total recoverable criteria, then the limitations shall be established in the permit or the permittee may request that effluent limitations be established based on criteria expressed as dissolved concentrations according to par. (b).

(b) If, following the procedures in par. (a), the permittee requests that effluent limitations be established based on criteria expressed as dissolved concentrations, the department shall determine the effluent limitations according to the procedures specified in this chapter using $WQ_{TRAN}$, the water quality criterion expressed as a dissolved concentration, and shall determine the necessity for water quality based effluent limitations according to s. NR 106.05. If the procedures in s. NR 106.05 do not result in the need for effluent limitations based upon the criteria expressed as dissolved concentrations, $WQ_{TRAN}$, then no limitations shall be established in the permit and the monitoring conditions in par. (c) 1. shall be included in the permit. If the procedures in s. NR 106.05 do result in the need for effluent limitations based upon the criteria expressed as dissolved concentrations, then the limitation is established in the permit and the requirements in par. (c) apply.

(c) If, following the procedures in par. (b), effluent limitations are established based upon water quality criteria expressed as dissolved concentrations, then the following shall also be included in the permit:

1. Monitoring requirements which may include, but are not limited to, effluent monitoring, monitoring of effluent toxicity, in-stream monitoring for unfiltered and filtered substances which may be limited in the permit, or other monitoring. Testing methods which allow appropriately sensitive detection limits may also be specified.

2. Conditions which require the permittee to document that reasonable steps have been taken to minimize or eliminate the sources of the substances for which effluent limitations expressed as dissolved concentrations have been established in the permit. The documentation may consist of implementation of a formal pre-treatment program, pollution reduction activities, and other documented efforts which are reasonably likely to reduce or eliminate sources of the substance. The documentation shall be submitted as specified in the permit, unless, prior to issuance of the permit, documented source elimination or reduction efforts have occurred. If reasonable steps have not been taken as specified in the permit, the department may establish effluent limitations based upon a water quality criterion expressed as total recoverable concentrations.

(d) The procedures in pars. (a) to (c) may also be used to establish effluent limits based on aquatic life secondary values.

**(8)** CUMULATIVE RISK FOR HUMAN CARCINOGENS. (a) If an effluent for a particular discharger contains more than one substance for which a human cancer criterion (HCC) exists at levels which warrant water quality based effluent limits, the incremental risk of each carcinogen should be assumed to be additive. Except as provided in par. (b), the water quality based limitation for each carcinogen shall be established in a permit to protect against additive or synergistic effects possibly associated with simultaneous multiple chemical human exposure such that the following condition is met:

$$\frac{C_1}{\text{Limit } 1} + \frac{C_2}{\text{Limit } 2} + \cdots + \frac{C_n}{\text{Limit } n} \leq 1$$

Where:

$C_{1\ldots n}$ = the monthly average concentration of each separate carcinogen in the effluent (assumed equal to zero if effluent concentration is not detected).

$\text{Limit}_{1\ldots n}$ = the effluent limitation concentration based on the human cancer criterion for each respective carcinogen.

**Note:** This additional condition is equivalent to a total incremental risk of cancer due to multiple chemicals not exceeding $10^{-5}$.

(b) If information is provided to the department that the carcinogenic risk is not additive, the limitations for each carcinogen will be determined based on that information.

**(9)** SEDIMENT DEPOSITION. The limitations calculated according to the procedures in this section may be reduced to prevent contamination of sediment with toxic substances or to prevent accumulation of the substance in sediments if determined necessary to protect water quality.

**(10)** ENVIRONMENTAL FATE. The limitations calculated pursuant to this section may be modified to account for degradation of the substance based on information available to the department provided that:

(a) The rate of degradation is documented by field studies supplied by the discharger, and

(b) The field studies demonstrate rapid and significant loss of the substance inside the mixing zone under the full range of critical conditions expected to be encountered; and

(c) The field studies are reviewed and approved by the department.

**(11)** OTHER METHODS OF CALCULATION. In lieu of sub. (4), scientifically defensible technical approaches such as calibrated and verified mathematical water quality models developed or adapted for a particular stream, simplified modeling approaches as outlined in "WATER QUALITY ASSESSMENT" (EPA-600/6-82- 004), or dynamic methods may be utilized in developing water quality based effluent limitations such that applicable water quality standards specified in chs. NR 102 to 105 are maintained.

**History:** Cr. Register, February, 1989, No. 398, eff. 3-1-89; am. (1) (a), (4) (c) 12., (d) 1., (4) (e) 1.,(6) (e), cr. (1) (b) 2., (2), (3) (d), (4) (c) 7. to 11., (d) 2., (e) 3., (5) (a) 4., (6) (c) 2., (d), (7), renum. (1) (b), (2) (a) to (c), (3) (a) to (c) 6., 9., (d) 1. and 3., (e) 1. to 6., (4) to (8) to be (8) to (11) and am. (3) (b), (c) (intro.), 4. to 6., (4) (a), (b) (intro.) 1., 2.,, (c) 4. and 5., (6) (a) to (c), (11) (d) 2., (4) (e) 3., (5) (a) 4., (6) (c) 2. and (d) 5. and (7), r. (2) (d), (3) (c) 7. and 8., (d) 2., (e) 7., Register, August, 1997, No. 500, eff. 9-1-97; CR 09-123: am. (4) (e) (title) Register July 2010 No. 655, eff. 8-1-10; CR 15-084: r. (2) (a), (b), cr. (2) (am), (bg), (br), r. and recr. (6) Register August 2016 No. 728, eff. 9-1-16; CR 15-085: r. and recr. (3) (b), cr. (3) (bm), am. (3) (c) (intro.), 4., 5., cr. (3) (e), (4) (f), am. (7) (intro.) Register August 2016 No. 728, eff. 9-1-16; correction in (3) (c) (intro.) made under s. 35.17, Stats., Regiter August 2016 No. 728.

**NR 106.07 Application of and compliance with water quality based effluent limitations in permits. (1)** PERMIT MONITORING FREQUENCY. The department shall determine on a case-by-case basis the monitoring frequency to be required for each water quality based effluent limitation in a permit.

**(2)** GENERAL. Except as provided in subs. (3) and (4), a chemical specific water quality-based effluent limitation that is calculated under this chapter shall be expressed in the permit as both a concentration limitation and a mass limitation unless the pollutant cannot appropriately be expressed by mass or a mass limitation is infeasible because the mass of the pollutant cannot be related to a measure of operation. Water quality-based mass limits for discharges of chlorine are not required in permits. The concentration limitation shall be expressed in units of mg/L or equivalent units. The mass limitation shall be expressed in units of kg/day or equivalent units. All of the following procedures shall be used when calculating mass limitations:

(a) For dischargers subject to ch. NR 210, an acute toxicity based concentration limitation that is derived by the procedure in s. NR 106.06 shall be converted to a mass limitation by using the discharger's maximum effluent flow, expressed as a daily total flow, that is anticipated to occur for 24 continuous hours during the design life of the treatment facility.

(b) For all other dischargers not subject to ch. NR 210, an acute toxicity based concentration limitation that is derived by the procedures in s. NR 106.06 shall be converted to a mass limitation by using the discharger's maximum effluent flow, expressed as a daily total flow, that has occurred for 24 continuous hours and represents normal operations. When calculating a mass limitation, the department may consider a projected increase in effluent flow that will occur when production is increased or modified, or another wastewater source, including storm water, that is added to an existing wastewater treatment facility. Limitations calculated under this paragraph are subject to the antidegradation requirements of ch. NR 207.

(c) A chronic toxicity, human health, or wildlife-based concentration limitation that is determined by the procedures in s. NR 106.06 shall be converted to a mass limitation by using the same effluent flow rate that was used in s. NR 106.06 (4) (d) to calculate the concentration limitation.

(d) A chronic toxicity-based mass limitation that is determined by the procedures in s. NR 106.11 shall be converted to a concentration limitation by using an effluent flow rate from s. NR 106.06 (4) (d).

**Note:** An example of when a mass limitation is infeasible is water quality-based mass limits for discharges of temperature.

**(3)** EXPRESSION OF CONCENTRATION LIMITATIONS IN PERMITS FOR CONTINUOUS DISCHARGES SUBJECT TO CH. NR 210. (a) *Applicability.* The procedures for expressing limitations in permits in this subsection apply to continuous discharges subject to ch. NR 210 when there is reasonable potential under s. NR 106.05 to exceed a water quality-based effluent limitation based on fish and aquatic life protection, human health, or wildlife protection that is calculated under s. NR 106.06. This subsection does not apply if another provision in this chapter or another Wisconsin administrative code chapter requires a different time period for expressing limits for a specific pollutant, type of discharge, or parameter, or if the department determines that expression of limitations in accordance with this subsection is impracticable under sub. (10).

**Note:** An example of a different time period for expressing limits for a specific pollutant or parameter is WET limitations as specified in s. NR 106.09.

(b) *Expression of water quality-based effluent limitations based on acute criterion.* If there is reasonable potential under s. NR 106.05 to exceed a water quality-based effluent limitation calculated under s. NR 106.06 for a pollutant that is based on an acute criterion or secondary value, that limitation shall be expressed as a daily maximum and included in the permit.

(c) *Expression of water quality-based effluent limitations based on chronic criterion.* If there is reasonable potential under s. NR 106.05 to exceed a water quality-based effluent limitation calculated under s. NR 106.06 for a pollutant that is based on a chronic criterion or secondary value that limitation shall be expressed as a weekly average and included in the permit.

(d) *Expression of water quality-based effluent limitations based on human health or wildlife criterion.* If there is reasonable potential under s. NR 106.05 to exceed a water quality-based effluent limitation calculated under s. NR 106.06 for a pollutant that is based on a human health or wildlife criterion or secondary value that limitation shall be expressed as a monthly average and included in the permit.

(e) *Additional permit limitations.* Both a weekly average and monthly average permit limitation shall be included in a permit for a pollutant whenever any water quality-based effluent limitation for that pollutant is determined necessary under pars. (b) to (d). A daily maximum limitation shall be included in a permit in addition to the weekly average and monthly average limitation if the daily maximum limitation is determined necessary under par. (b). The department shall use all of the following procedures to include weekly average and monthly average limitations in permits:

1. If a daily maximum limitation is the only limitation determined necessary for a pollutant under s. NR 106.05, a weekly average and monthly average limitation shall still be included in the permit and shall be set equal to the daily maximum limitation or the calculated weekly average and monthly average water quality-based effluent limitations, whichever is more restrictive.

2. If a weekly average limitation is determined necessary for a pollutant under s. NR 106.05, but a monthly average limitation is not determined necessary for that pollutant in the permit under s. NR 106.05, a monthly average limitation shall still be included in the permit and shall be set equal to the weekly average limitation or the monthly average water quality-based effluent limitation calculated under s. NR 106.06, whichever is more restrictive. A daily maximum limitation shall be included if deemed necessary under s. NR 106.05.

3. If a daily maximum and monthly average limitation are

determined necessary in a permit for a pollutant under s. NR 106.05, but a weekly average limit is not necessary for that pollutant under s. NR 106.05, a weekly average limitation shall still be included in the permit for the pollutant and shall be set equal to the daily maximum limitation or the weekly average water quality-based effluent limitation calculated under s. NR 106.06, whichever is more restrictive.

4. If a monthly average limitation is the only limitation determined to be necessary for a pollutant under s. NR 106.05, a weekly average limitation shall still be included in the permit and shall be set equal to the weekly average water quality-based effluent limitation calculated under s. NR 106.06, or a weekly average limitation calculated using the following procedure, whichever is more restrictive:

Weekly Average Limitation = (Monthly Average Limitation x MF)

Where:

MF = Multiplication factor as defined in Table 1

CV = The coefficient of variation (CV) as calculated in sub. (5m)

n = the number of samples per month required in the permit.

**Table 1 — Multiplication Factor**

| CV | n=1 | n=2 | n=3 | n=4 | n=8 | n=12 | n=16 | n=20 | n=24 | n=30 |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.1 | 1.00 | 1.07 | 1.10 | 1.12 | 1.16 | 1.17 | 1.18 | 1.19 | 1.20 | 1.20 |
| 0.2 | 1.00 | 1.13 | 1.20 | 1.24 | 1.32 | 1.36 | 1.39 | 1.40 | 1.41 | 1.43 |
| 0.3 | 1.00 | 1.19 | 1.29 | 1.36 | 1.49 | 1.56 | 1.60 | 1.63 | 1.65 | 1.67 |
| 0.4 | 1.00 | 1.24 | 1.37 | 1.46 | 1.66 | 1.75 | 1.81 | 1.86 | 1.89 | 1.93 |
| 0.5 | 1.00 | 1.28 | 1.45 | 1.56 | 1.81 | 1.94 | 2.02 | 2.08 | 2.13 | 2.18 |
| 0.6 | 1.00 | 1.31 | 1.51 | 1.64 | 1.95 | 2.12 | 2.23 | 2.30 | 2.36 | 2.43 |
| 0.7 | 1.00 | 1.34 | 1.55 | 1.71 | 2.08 | 2.28 | 2.41 | 2.51 | 2.58 | 2.67 |
| 0.8 | 1.00 | 1.35 | 1.59 | 1.76 | 2.19 | 2.42 | 2.58 | 2.70 | 2.79 | 2.89 |
| 0.9 | 1.00 | 1.36 | 1.61 | 1.80 | 2.27 | 2.54 | 2.73 | 2.86 | 2.97 | 3.09 |
| 1.0 | 1.00 | 1.37 | 1.63 | 1.83 | 2.34 | 2.64 | 2.85 | 3.01 | 3.13 | 3.27 |
| 1.1 | 1.00 | 1.37 | 1.63 | 1.84 | 2.39 | 2.72 | 2.95 | 3.13 | 3.27 | 3.43 |
| 1.2 | 1.00 | 1.36 | 1.63 | 1.85 | 2.43 | 2.79 | 3.04 | 3.23 | 3.38 | 3.56 |
| 1.3 | 1.00 | 1.36 | 1.63 | 1.85 | 2.45 | 2.83 | 3.10 | 3.31 | 3.48 | 3.68 |
| 1.4 | 1.00 | 1.35 | 1.62 | 1.84 | 2.46 | 2.86 | 3.15 | 3.37 | 3.55 | 3.77 |
| 1.5 | 1.00 | 1.34 | 1.61 | 1.83 | 2.46 | 2.88 | 3.18 | 3.42 | 3.61 | 3.85 |
| 1.6 | 1.00 | 1.33 | 1.60 | 1.82 | 2.46 | 2.89 | 3.20 | 3.45 | 3.66 | 3.90 |
| 1.7 | 1.00 | 1.32 | 1.58 | 1.80 | 2.45 | 2.88 | 3.21 | 3.47 | 3.69 | 3.95 |
| 1.8 | 1.00 | 1.31 | 1.57 | 1.78 | 2.43 | 2.87 | 3.21 | 3.48 | 3.70 | 3.98 |
| 1.9 | 1.00 | 1.30 | 1.55 | 1.76 | 2.41 | 2.86 | 3.20 | 3.48 | 3.71 | 3.99 |
| 2.0 | 1.00 | 1.29 | 1.54 | 1.74 | 2.38 | 2.84 | 3.19 | 3.47 | 3.71 | 4.00 |

5. Limitations calculated under subds.1. to 4. shall be expressed in terms of concentration unless the department determines that a mass limitation is also necessary to protect fish and aquatic life, human health, or wildlife due to the variability of effluent flow or stream flow or other site-specific factors.

**Note:** This methodology is based on the *Technical Support Document for Water Quality-based Toxics Control* (March 1991). PB91-127415.

**(4)** EXPRESSION OF CONCENTRATION LIMITATIONS IN PERMITS FOR CONTINUOUS DISCHARGES NOT SUBJECT TO CH. NR 210. (a) *Applicability.* The procedures for expressing limitations in this subsection apply to continuous discharges that are not subject to ch. NR 210 and when there is reasonable potential under s. NR 106.05 to exceed a water quality-based effluent limitation based on fish and aquatic life protection, human health, or wildlife protection that is calculated under s. NR 106.06. This subsection does not apply if another provision in this chapter or another Wisconsin administrate code chapter requires a different time period for expressing limits that is specific to a pollutant, type of discharge, or other parameter, or if the department determines that expression of limitations in accordance with this subsection is impracticable under sub. (10).

**Note:** An example of a different time period for expressing limits for a specific pollutant or parameter is WET limitations as specified in s. NR 106.09.

(b) *Expression of water quality-based effluent limitations based on acute criterion.* If there is reasonable potential under s. NR 106.05 to exceed a water quality-based effluent limitation calculated under s. NR 106.06 for a pollutant that is based on an acute criterion or secondary value that limitation shall be expressed as a daily maximum and included in the permit.

(c) *Expression of water quality-based effluent limitations based on chronic criterion.* If there is reasonable potential under s. NR 106.05 to exceed a water quality-based effluent limitation calculated under s. NR 106.06 for a pollutant that is based on a chronic criterion or secondary value that limitation shall be expressed as a weekly average and included in the permit.

(d) *Expression of water quality-based effluent limitations based on human health or wildlife criterion.* If there is reasonable potential under s. NR 106.05 to exceed a water quality-based effluent limitation calculated under s. NR 106.06 for a pollutant that is based on a human health or wildlife criterion or secondary value that limitation shall be expressed as a monthly average and included in the permit.

(e) *Additional permit limitations.* Both a daily maximum and monthly average permit limitation shall be included in a permit for a pollutant whenever any water quality-based effluent limitation for that pollutant is determined necessary under pars. (b) to (d). A weekly average limitation shall be included in a permit in addition to daily maximum and monthly average limitation if the weekly average limit is determined necessary under par. (c). The department shall use all of the following procedures to include daily maximum and monthly average limitations in permits:

1. If a daily maximum limitation is the only limitation determined necessary for a pollutant under s. NR 106.05, a monthly average limitation shall still be included in the permit and set equal to the daily maximum limitation or the monthly average water quality-based effluent limitation calculated under s. NR 106.06, whichever is more restrictive.

2. If a weekly average limitation is the only limitation determined necessary for a pollutant under s. NR 106.05 a monthly av-

erage limitation shall still be included in the permit and shall be set equal to the weekly average limitation or the monthly average water quality-based effluent limitation calculated under s. NR 106.06, whichever is more restrictive. A daily maximum limitation shall also be included in the permit and set equal to the daily maximum water quality-based effluent limitation calculated under s. NR 106.06 or a daily maximum limitation calculated using the following procedure, whichever is more restrictive:

Daily Maximum Limitation= WQBELc x DMF

Where:

WQBELc = water quality-based effluent limitation calculated based on chronic criteria under s. NR 106.06.

DMF = Daily Multiplication Factor as defined in Table 2, where

CV = The coefficient of variation (CV) as calculated in sub. (5m)

**Table 2 — Daily Multiplication Factor**

| CV | Multiplying Factor |
|---|---|
| 0.1 | 1.114 |
| 0.2 | 1.235 |
| 0.3 | 1.359 |
| 0.4 | 1.460 |
| 0.5 | 1.557 |
| 0.6 | 1.639 |
| 0.7 | 1.712 |
| 0.8 | 1.764 |
| 0.9 | 1.802 |
| 1.0 | 1.828 |
| 1.1 | 1.842 |
| 1.2 | 1.849 |
| 1.3 | 1.851 |
| 1.4 | 1.843 |
| 1.5 | 1.830 |
| 1.6 | 1.815 |
| 1.7 | 1.801 |
| 1.8 | 1.781 |
| 1.9 | 1.751 |
| 2.0 | 1.744 |

3. If a monthly average limitation is determined necessary, but a daily maximum limitation is not determined necessary for that pollutant under s. NR 106.05, a daily maximum limitation shall still be included in the permit and shall be set equal to the daily maximum water quality-based effluent limitation calculated under s. NR 106.06 or a daily maximum limitation calculated using the following procedure, whichever is more restrictive:

Daily Maximum Limitation = (Monthly Average Limitation x MF)

Where:

Multiplication Factor = Multiplication Factor as defined in sub. (3) (e) 4. Table 1, where

CV = The coefficient of variation (CV) as calculated in sub. (5m)

n = the number of samples per month required in the permit

4. Limitations calculated under subds. 1. to 3. shall be expressed in terms of concentration unless the department determines that a mass limitation is also necessary to protect fish and aquatic life, human health, or wildlife due to the variability of effluent flow or stream flow or other site-specific factors.

**Note:** This methodology is based on the *Technical Support Document for Water Quality-based Toxics Control* (March 1991). PB91-127415.

**(5)** EXPRESSION OF CONCENTRATION LIMITATIONS IN PERMITS FOR NONCONTINUOUS DISCHARGES. (a) *Applicability.* The procedures for expressing limitations in this subsection apply to seasonal discharges, discharges proportional to stream flow, or other unusual discharge situations that do not meet the definition of a continuous discharge under s. NR 205.03 (9g) when there is reasonable potential under s. NR 106.05 to exceed a water quality-based effluent limitation based on fish and aquatic life protection, human health, or wildlife protection. Water quality-based effluent limitations shall be calculated under s. NR 106.06.

(b) *Acute reasonable potential.* Pursuant to s. NR 106.05, if there is reasonable potential to exceed a water quality-based effluent limitation for a pollutant that is based on an acute criterion or secondary value then the acute concentration limitation calculated under s. NR 106.06 shall be expressed as a daily maximum and included in the permit.

(c) *Chronic and human health or wildlife reasonable potential.* Pursuant to s. NR 106.05, if there is reasonable potential to exceed a water quality-based effluent limitation for a pollutant based on a chronic, a human health, or a wildlife criterion or secondary value, limitations shall be included in the permit and expressed on a case-by-case basis. The department shall consider all of the following factors:

1. Frequency and duration of discharge.
2. Total mass of discharge.
3. Maximum flow rate of discharge.
4. Whether the pollutant is subject to a technology-based limitation or other limitation expressed by mass, concentration, or other appropriate measure in the permit.

**(5m)** COEFFICIENT OF VARIATION. (a) The coefficient of variation (CV) shall be calculated as the ratio of the standard deviation of the representative effluent data divided by the arithmetic average of the representative effluent data, except as provided in par. (b).

(b) If there are fewer than 10 representative data points the CV shall be set equal to 0.6.

(c) When calculating the CV in par. (a) a monitoring result less than the limit of detection may be assigned a value of zero. If the effluent limitation is less than the limit of detection, the department may substitute a value other than zero for results less than the limit of detection, after considering the number of monitoring results that are greater than the limit of detection and if warranted when applying appropriate statistical techniques.

**(6)** LIMITATIONS BELOW THE LEVEL OF DETECTION OR QUANTIFICATION. When the water quality based effluent limitation for any substance in a permit is less than the limit of detection or the limit of quantitation, the following conditions shall apply:

(a) The permittee shall perform monitoring required in the permit using an acceptable analytical methodology for that substance in the effluent which produces the lowest limit of detection and limit of quantitation.

(b) The permittee shall determine the limit of detection and limit of quantitation using a method specified by the department.

(c) Compliance with concentration and mass limitations shall be determined as follows:

1. When the water quality based effluent limitation is less than the limit of detection, effluent levels less than the limit of detection are in compliance with the effluent limitation.

2. When the water quality based effluent limitation is less

than the limit of detection, effluent levels greater than the limit of detection, but less than the limit of quantitation are in compliance with the effluent limitation except when analytically confirmed and statistically confirmed by a sufficient number of analyses of multiple samples and use of appropriate statistical techniques. The department may require in a permit additional monitoring when effluent levels are between the limit of detection and the limit of quantitation.

3. When the water quality based effluent limitation is greater than the limit of detection, but less than the limit of quantitation effluent levels less than the limit of detection or less than the limit of quantitation are in compliance with the effluent limitation.

(d) When the water quality based effluent limitation is expressed in the permit as a daily maximum or average mass limitation, compliance is determined according to par. (c) after converting the limit of detection and limit of quantitation to mass values using appropriate conversion factors and the actual daily effluent flow, or actual average effluent flow for the averaging period.

(e) Except as provided in this paragraph, when calculating an average or mass discharge level for determining compliance with an effluent limitation according to the provisions of par. (c), a monitoring result less than the limit of detection may be assigned a value of zero. If the effluent limitation is less than the limit of detection, the department may substitute a value other than zero for results less than the limit of detection, after considering the number of monitoring results that are greater than the limit of detection and if warranted when applying appropriate statistical techniques.

(f) Unless the permittee can demonstrate continuous compliance with the limit, the department shall include a condition in the permit requiring the permittee to develop and implement or update and implement a cost-effective pollutant minimization program as specified in s. NR 106.04 (5).

**(7)** WHOLE EFFLUENT TOXICITY AS ALTERNATIVE LIMIT. The department may establish a whole effluent toxicity limitation according to s. NR 106.09 as an alternative to a chemical specific water quality-based effluent limitation based on a fish and aquatic life secondary acute or secondary chronic value determined according to ss. NR 105.05 (4) and 105.06 (6). The alternative whole effluent toxicity limitation shall meet all the following conditions:

(a) The fathead minnow *(Pimephales promelas)* or the cladoceran *Ceridaphnia dubia* were represented in the toxicological database used to generate the secondary value:

(b) The permittee has requested the alternative whole effluent toxicity limitation; and

(c) Whole effluent toxicity testing required in the permit shall be conducted at a frequency to be determined by the department, but at least once every 3 months during the entire term of the permit.

**(8)** SECONDARY VALUES AND STUDIES WITHIN THE GREAT LAKES BASIN. If the effluent limitation based on a secondary value is established in a permit, a permittee discharging to the Great Lakes as defined in s. NR 102.22 (5) may request that additional time be added to the compliance schedule, according to s. NR 106.117 (2), for the permittee to conduct studies, other than studies for site-specific criteria under s. NR 105.02 (1), that are needed to propose a revision to the secondary value upon which the effluent limitation is based. During this time, the permittee may provide additional data necessary to either refine the secondary value or calculate a water quality criterion.

**(9)** WET WEATHER MASS LIMITATIONS. In addition to the mass limitation calculated under sub. (2) (c), for a discharger subject to ch. NR 210 and which discharges on a year-around basis, the department shall include in the permit an alternative wet weather mass limitation. For purposes of compliance, this alternative wet weather mass limitation shall apply when the mass discharge level exceeds the mass limitation calculated under sub. (2) (c) and when the permittee demonstrates to the satisfaction of the department that the discharge exceedance is caused by and occurs during a wet weather event. For purposes of this subsection, a wet weather event occurs during and immediately following periods of precipitation or snowmelt, including but not limited to rain, sleet, snow, hail or melting snow, during which water from the precipitation, snowmelt or elevated groundwater enters the sewerage system through infiltration or inflow, or both. In calculating this alternative wet weather mass limitation, the department shall use the concentration limit determined by the procedures in s. NR 106.06, the appropriate conversion factor and the appropriate effluent flow given in either par. (a) or (b).

(a) For effluent limitations based on aquatic life chronic toxicity criteria or secondary chronic values, the maximum effluent flow, expressed as a daily average, that is anticipated to occur for 7 continuous days during the design life of the treatment facility.

(b) For effluent limitations based on wildlife, human threshold or human cancer criteria or secondary values, or taste and odor criteria, the maximum effluent flow, expressed as a daily average, that is anticipated to occur for 30 continuous days during the design life of the treatment facility.

**(10)** ALTERNATIVE METHODS FOR LIMIT EXPRESSION. The department may use an alternative method from the methodology specified in subs. (3) to (5) to express water quality-based effluent limitations in permits if the department determines that the methods in subs. (3) to (5) are impracticable and an alternative methodology is necessary and appropriate and adequately protective of the designated uses of the receiving and downstream waters as specified in ch. NR 102.

**History:** Cr. Register, February, 1989, No. 398, eff. 3-1-89; renum. (2) to (5) to be (3) to (6) and am., cr. (2), (6) (d) to (f) and (7) to (9), Register, August, 1997, No. 500, eff. 9-1-97; correction in (7) made under s. 13.93 (2m) (b) 1., Stats., Register, October, 1999, No. 526; correction in (8) made under s. 13.93 (2m) (b) 7., Stats., Register February 2004 No. 578; CR 09-123: am. (2) (intro.), (a) and (b) Register July 2010 No. 655, eff. 8-1-10; CR 15-085: cr. (1) (title), r. and recr. (2) to (5), cr. (5m), (6) (title), (7) (title), (8) (title), am. (8), cr. (9) (title), (10) Register August 2016 No. 728, eff. 9-1-16.

**NR 106.08 Determination of the necessity for whole effluent toxicity testing requirements and limitations. (1)** GENERAL. The department shall establish whole effluent toxicity testing requirements and limitations whenever necessary to meet applicable water quality standards as specified in chs. NR 102 to 105 as measured by exposure of aquatic organisms to an effluent and specified effluent dilutions. When considering the necessity for whole effluent toxicity testing requirements and limitations, the department shall consider in-stream biosurvey data and data from ambient toxicity analyses, whenever such data are available.

**(2)** DETERMINATION OF NECESSITY. If representative discharge data are available for an effluent being discharged from a point source, whole effluent toxicity testing requirements are necessary when any of the following apply:

(a) Existing aquatic life toxicity test data generated according to standard test protocols indicate a potential for an effluent from a point source discharge to adversely impact the receiving water aquatic life community.

(b) A water quality-based effluent limitation for a toxic substance is determined necessary in s. NR 106.05.

**(3)** REPRESENTATIVE DATA. Toxicity test data available to the department shall be considered representative when all of those data meet the following conditions:

(a) Data are representative of normal discharge conditions and current effluent quality.

(b) Data were produced by a lab certified or registered under ch. NR 149.

(c) Data were produced from toxicity test procedures specified in the permit.

(d) Data were produced from toxicity tests that met all applicable quality assurance or quality control requirements specified in the permit.

**(4)** NO REPRESENTATIVE DATA. If no representative discharge data are available for an effluent being discharged from a point source, whole effluent toxicity testing requirements are necessary if, in the judgment of the department, water quality standards may be exceeded. In such cases, all of the following factors shall be considered:

(a) Any relevant information that is available that indicates a potential for an effluent to impact the receiving water aquatic life community.

(b) Available dilution in the receiving water.

(c) Discharge category and predicted effluent quality.

(d) Proximity to other point source dischargers.

**(5)** OTHER CONSIDERATIONS. Regardless of the results of the analysis conducted under this section, the department may, whenever determined necessary, require whole effluent toxicity testing for a point source discharge. The department may use information submitted under s. 323.60 (5) (c) and (d), Stats., together with other information, in determining when whole effluent toxicity testing is necessary.

**(6)** REASONABLE POTENTIAL TO RECEIVE AN ACUTE OR CHRONIC WHOLE EFFLUENT TOXICITY LIMIT. (a) *General.* Whole effluent toxicity limits are established in a permit according to s. NR 106.09 whenever representative, facility-specific whole effluent toxicity data demonstrate that the effluent is or may be discharged at a level that will cause, have the potential to cause, or contribute to an excursion of a water quality standard. Whole effluent toxicity limits may also be imposed in the absence of facility-specific whole effluent toxicity test data, on a case-by-case basis, whenever facility-specific or site-specific data or conditions indicate toxicity to aquatic life that is attributable to the discharger.

(b) *Reasonable potential.* 1. If a zone of initial dilution has not been approved by the department, the potential to exceed an acute criterion shall be calculated using the following equation:

(TUa effluent) (B) > 1.0

Where:

| | | |
|---|---|---|
| TUa effluent | = | Maximum calculated TUa from the most sensitive species in the data set |
| B | = | Reasonable potential multiplication factor determined under par. (c) |
| 1.0 | = | Numeric acute WET limitation in acute toxic units (TUa) derived from narrative criterion in s. NR 102.04 (1) (d) |

2. If a zone of initial dilution has been approved by the department, the potential to exceed an acute criterion shall be calculated using the following equation:

[(TUa effluent) (B) (AMZ)] > 1.0

Where:

| | | |
|---|---|---|
| TUa effluent | = | Maximum calculated TUa from the most sensitive species in the data set |
| B | = | Reasonable potential multiplication factor determined under par. (c) |
| AMZ | = | Acute mixing zone concentration based on presence of a zone of initial dilution as defined in s. NR 106.03 (1) expressed as a decimal |
| 1.0 | = | Numeric acute WET limitation in acute toxic units (TUa) derived from narrative criterion in s. NR 102.04 (1) (d) |

3. The potential to exceed a chronic criterion shall be calculated using the following equation:

[(TUc effluent) (B) (IWC)]> 1.0

Where:

| | | |
|---|---|---|
| TUc effluent | = | Maximum calculated TUc from the most sensitive species in the data set |
| B | = | Reasonable potential multiplication factor determined under par. (c) |
| IWC | = | Instream waste concentration as defined in s. NR 106.03 (6) expressed as a decimal |
| 1.0 | = | Numeric chronic WET limitation in chronic toxic units (TUc) derived from narrative criterion in s. NR 102.04 (4) (d) |

(c) *Reasonable potential multiplication factor.* The department shall use the reasonable potential multiplication factor in par. (b) to convert the calculated effluent toxicity value to the estimated 95th percentile toxicity value. The department shall use all of the following methods to select a reasonable potential multiplication factor:

1. When there are less than 10 individual toxicity detects, the multiplication factor shall be taken from Table 4 and based on a coefficient of variation of 0.6.

2. When there are 10 or more individual toxicity detects, the multiplication factor shall be taken from Table 4 and based on coefficient of variation calculated as the standard deviation of the WET test endpoints, IC25, IC50, or LC50, divided by the arithmetic mean of the WET tests.

**Table 4 — Reasonable Potential Multiplication Factor**

| | Coefficient of variation (CV) | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Number of samples (n)** | **0.1** | **0.2** | **0.3** | **0.4** | **0.5** | **0.6** | **0.7** | **0.8** | **0.9** | **1.0** | **1.1** | **1.2** | **1.3** | **1.4** | **1.5** | **1.6** | **1.7** | **1.8** | **1.9** | **2.0** |
| 1 | - | - | - | - | - | 6.2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2 | - | - | - | - | - | 3.8 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 3 | - | - | - | - | - | 3.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4 | - | - | - | - | - | 2.6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 5 | - | - | - | - | - | 2.3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

| Coefficient of variation (CV) | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Number of samples (n)** | **0.1** | **0.2** | **0.3** | **0.4** | **0.5** | **0.6** | **0.7** | **0.8** | **0.9** | **1.0** | **1.1** | **1.2** | **1.3** | **1.4** | **1.5** | **1.6** | **1.7** | **1.8** | **1.9** | **2.0** |
| 6 | - | - | - | - | - | 2.1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 7 | - | - | - | - | - | 2.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 8 | - | - | - | - | - | 1.9 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 9 | - | - | - | - | - | 1.8 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 10 | 1.1 | 1.2 | 1.3 | 1.5 | 1.6 | 1.7 | 1.9 | 2.0 | 2.2 | 2.3 | 2.4 | 2.6 | 2.7 | 2.8 | 3.0 | 3.1 | 3.2 | 3.3 | 3.4 | 3.6 |
| 11 | 1.1 | 1.2 | 1.3 | 1.4 | 1.6 | 1.7 | 1.8 | 1.9 | 2.1 | 2.2 | 2.3 | 2.4 | 2.5 | 2.7 | 2.8 | 2.9 | 3.0 | 3.1 | 3.2 | 3.3 |
| 12 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.9 | 2.0 | 2.1 | 2.2 | 2.3 | 2.4 | 2.5 | 2.6 | 2.7 | 2.8 | 2.9 | 3.0 | 3.0 |
| 13 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 | 2.1 | 2.2 | 2.3 | 2.4 | 2.5 | 2.5 | 2.6 | 2.7 | 2.8 | 2.9 |
| 14 | 1.1 | 1.2 | 1.3 | 1.4 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 | 2.1 | 2.2 | 2.3 | 2.3 | 2.4 | 2.5 | 2.6 | 2.6 | 2.7 |
| 15 | 1.1 | 1.2 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.8 | 1.9 | 2.0 | 2.1 | 2.2 | 2.2 | 2.3 | 2.4 | 2.4 | 2.5 | 2.5 |
| 16 | 1.1 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.6 | 1.7 | 1.8 | 1.9 | 1.9 | 2.0 | 2.1 | 2.1 | 2.2 | 2.3 | 2.3 | 2.4 | 2.4 |
| 17 | 1.1 | 1.1 | 1.2 | 1.3 | 1.4 | 1.4 | 1.5 | 1.6 | 1.7 | 1.7 | 1.8 | 1.9 | 1.9 | 2.0 | 2.0 | 2.1 | 2.2 | 2.2 | 2.3 | 2.3 |
| 18 | 1.1 | 1.1 | 1.2 | 1.3 | 1.3 | 1.4 | 1.5 | 1.6 | 1.6 | 1.7 | 1.7 | 1.8 | 1.9 | 1.9 | 2.0 | 2.0 | 2.1 | 2.1 | 2.2 | 2.2 |
| 19 | 1.1 | 1.1 | 1.2 | 1.3 | 1.3 | 1.4 | 1.5 | 1.5 | 1.6 | 1.6 | 1.7 | 1.8 | 1.8 | 1.9 | 1.9 | 2.0 | 2.0 | 2.0 | 2.1 | 2.1 |
| 20 | 1.1 | 1.1 | 1.2 | 1.2 | 1.3 | 1.4 | 1.4 | 1.5 | 1.5 | 1.6 | 1.6 | 1.7 | 1.7 | 1.8 | 1.8 | 1.9 | 1.9 | 2.0 | 2.0 | 2.0 |
| 30 | 1.0 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.2 | 1.3 | 1.3 | 1.3 | 1.3 | 1.4 | 1.4 | 1.4 | 1.4 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| 40 | 1.0 | 1.0 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.3 | 1.3 |
| 50 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 |
| 60 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| 70 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| 80 | 1.0 | 1.0 | 1.0 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 |
| 90 | 1.0 | 1.0 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 |
| 100 | 1.0 | 1.0 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.7 | 0.7 | 0.7 |

(d) *Maximum toxicity values.* The department shall set the TUc effluent and TUa effluent values in par. (b) equal to zero whenever toxicity is not detected or the LC50, IC25, or IC50 equals or exceeds 100% effluent.

(e) *Exception.* WET limits are not necessary under this subsection when the department determines chemical-specific limits for the effluent are sufficient to attain and maintain applicable numeric and narrative water quality standards, taking into consideration all of the following:

1. Existing controls on the discharge.

2. Controls on the pollutant discharged by nonpoint source pollution in the watershed.

3. The variability of the pollutant or parameter in the effluent discharged.

4. Sensitivity of species to toxicity testing when evaluating whole effluent toxicity as defined in s. NR 106.03.

5. Dilution of the effluent in the receiving water.

(f) *Fact sheet.* If the department determines WET limitations are not necessary under par. (e), all of the factors that are required for the determination must be specifically discussed in the fact sheet for the permit.

**(7)** DATA EXCLUSIONS. The department may exclude data from a WET reasonable potential determination when those data meet any of the following conditions:

(a) Data are not representative under sub. (3).

(b) Positive WET results are caused by deficiency toxicity only.

(c) Positive WET results are caused by groundwater or surface water remediation needed to correct or prevent an existing surface or groundwater contamination situation or a public health problem.

**History:** Cr. Register, February, 1989, No. 398, eff. 3-1-89; am. (1), r. and recr. (5), Register, August, 1997, No. 500, eff. 9-1-97; CR 09-123: am. (5) (a) Register July 2010 No. 655, eff. 8-1-10; correction in (4) made under s. 13.92 (4) (b) 7., Stats., Register July 2010 No. 655; CR 15-085: r. and recr. Register August 2016 No. 728, eff. 9-1-16; CR 17-002: cr. (6) (e), (f) Register April 2018 No. 748, eff. 5-1-18.

**NR 106.09 Whole effluent toxicity data evaluation and limitations. (1)** DATA EVALUATION. Data evaluation procedures are specified in the whole effluent toxicity test methods specified in s. NR 219.04, Table A. In the event of a WET test failure, facility specific requirements shall be established in the WPDES permit which specify required follow-up actions.

**(2)** ACUTE WHOLE EFFLUENT TOXICITY. (a) Except as provided in par. (c), the department shall establish acute whole effluent toxicity limitations to ensure that substances shall not be present in amounts which are acutely harmful to aquatic life in all surface waters including the mixing zone and effluent channel as required by s. NR 102.04 (1).

(b) To assure compliance with par. (a), a whole effluent toxicity test may not result in a statistically valid $LC_{50}$ less than 100% with the following taxa-specific exposure periods:

1. 48 hours for aquatic invertebrate organisms (including *Ceriodaphnia dubia)*;

2. 96 hours for aquatic vertebrate organisms (including fathead minnows (*Pimephales promelas*));

3. Any other exposure period deemed appropriate by the department for a specific test organism.

(c) If a zone of initial dilution is determined appropriate in accordance with the provisions of s. NR 106.06 (3) (c), whole effluent acute toxicity limitations determined by this subsection shall be adjusted such that the effluent meets the following condition. The adjustment shall insure that after dilution of the effluent with the receiving water at a concentration equal to 3.3 times the percent dilution value calculated through application of the zone of initial dilution, the test solution of effluent and receiving water shall not produce a statistically valid $LC_{50}$ less than 3.3 times the percent dilution value determined through application of the zone of initial dilution with the exposure periods as provided in par. (b).

(d) If, in the judgment of the department, the statistical interpretation methods used to test for $LC_{50}$ are not appropriate for a specific data set, empirical interpretation methods may be used to determine the significance of an effect.

(e) Acute whole effluent toxicity limits shall be expressed as 1.0 $TU_a$ unless an AMZ is approved in which case these limits shall be expressed as a value that is 100 divided by the AMZ. Compliance with an acute whole effluent toxicity water quality-based limitation shall be determined by comparing the $TU_a$ endpoint from each toxicity test to the limitation. Pursuant to s. NR

106.08 (6) (d) a calculated LC50 that exceeds 100% is set equal to zero.

**Note:** A toxicity reduction evaluation study is not always required in the event an acute WET limit is imposed in a permit.

(f) Whole effluent acute toxicity limitations shall be expressed in permits as daily maximum limitations.

**(3)** CHRONIC WHOLE EFFLUENT TOXICITY. (a) The department shall establish chronic whole effluent toxicity limitations to ensure that concentrations of substances are not discharged from a point source that alone or in combination with other materials present are toxic to fish or other aquatic life as required by s. NR 102.04 (4) (d).

(b) To assure compliance with par. (a), an effluent, after dilution with an appropriate allowable quantity of receiving water flow equivalent to that provided by receiving water flows specified in s. NR 106.06 (3) (c) or implied in s. NR 106.06 (3) (b) 2., may not cause a significant adverse effect to a test organism population when compared to an appropriate control, as determined by applying all of the following:

1. Using statistical interpretation methods appropriate to the toxicity test protocol, an adverse effect will be determined to be significant if the statistically derived IC25 or IC50, as specified for each species in the whole effluent toxicity test methods required in s. NR 219.04, Table A, from the whole effluent toxicity test, is less than the calculated IWC.

2. If, in the judgment of the department, the statistical interpretation methods used to test for significance are not appropriate for a specific data set, empirical interpretation methods may be used to determine the significance of an effect.

(c) Chronic whole effluent toxicity limits shall be expressed as a value that is 100 divided by the IWC. Compliance with a chronic whole effluent toxicity water quality-based limitation shall be determined by comparing the monthly average calculated TUc from all toxicity tests conducted during that month to the limitation. Pursuant to s. NR 106.08 (6) (d), a calculated IC25 or IC50 that exceeds 100% is set equal to zero.

**Note:** A toxicity reduction evaluation study is not always required in the event a chronic WET limit is imposed in a permit.

(d) Whole effluent chronic toxicity limitations shall be expressed in permits as monthly average limitations.

**History:** Cr. Register, February, 1989, No. 398, eff. 3-1-89; renum. (1) (a), (b), (c) (intro.) and 2. and (2) to be (2) (a) to (c) and (3) and am. (2) (b), (c), (3) (a), (b) (intro.) and 1., r. (1) (c) 1., cr. (1), Register, August, 1997, No. 500, eff. 9-1-96; CR 03-050: am. (2) (b) (intro.) Register February 2004 No. 578, eff. 3-1-04; CR 04-101: am. (1) Register May 2005 No. 593, eff. 6-1-05; CR 15-085: r. and recr. (2) (e), cr. (2) (f), am. (3) (b) (intro.), 1., r. and recr. (3) (c), cr. (3) (d) Register August 2016 No. 728, eff. 9-1-16.

**NR 106.10 Noncontact cooling water additives.** The department shall establish water quality based effluent limitations for toxic and organoleptic substances in noncontact cooling water discharges as follows:

**(1)** For toxic and organoleptic substances commonly added by suppliers of drinking water systems and present in the noncontact cooling water, a water quality based effluent limitation calculated under s. NR 106.06 that is based on the applicable water quality criterion or secondary value shall be included in the permit unless the permittee demonstrates at least one of the following:

(a) The concentration of the substance in the intake water is dissipated within the system that supplies the intake water to the permittee and is consistently less than the water quality based effluent limitation.

(b) An effluent limitation is not necessary as determined using the reasonable potential procedures in s. NR 106.05.

(c) Prior to reaching the receiving water, the substance dissipates or is removed to a level that is below the water quality based effluent limitation.

**(2)** For other toxic and organoleptic substances intentionally added to noncontact cooling water by the permittee, the department shall follow the procedures specified in ss. NR 106.05 and 106.06 to calculate a water quality based effluent limitation and determine whether the limitation is necessary in the permit. If there is no water quality criterion for an additive and there are potential water quality impacts from the additive, the department shall establish a secondary value for the additive in accordance with ch. NR 105 and calculate a limitation based on that value. All of the following requirements apply to the use and discharge of additives:

(a) A permittee shall obtain written approval from the department prior to use of the additive.

(b) A permittee shall provide the department with dosage information and safety data sheets and toxicological data, as requested by the department to meet minimum data requirements specified in ss. NR 105.05 (4) and 105.06 (6) for each additive for which approval is sought.

(c) Prior to increasing the usage of an additive in amounts greater than authorized by the department, a permittee shall get written approval from the department for the increased usage.

(d) After reissuance, if a permittee wants to use a new additive not previously approved by the department, the permittee shall get written approval from the department prior to use of the additive.

(e) A permittee may only use additives in accordance with the conditions of the department approval and any applicable permit terms. If the department does not approve use of the additive, the additive may not be discharged.

**History:** Cr. Register, February, 1989, No. 398, eff. 3-1-89; am. (1) (a), (b) and (2), cr. (1) (d), August, 1997, No. 500, eff. 9-1-97; CR 03-050: am. (1) (intro.) Register February 2004 No. 578, eff. 3-1-04; CR 15-084: r. and recr. Register August 2016 No. 728, eff. 9-1-16; correction in (2) (intro.) made under s. 35.17, Stats., Register August 2016 No. 728.

**NR 106.11 Multiple discharges.** Whenever the department determines that more than one discharge may be affecting the water quality of the same receiving water for one or more substances, the provisions of this chapter shall be used to calculate the combined allowable load from the discharges necessary to meet the water quality criteria for the substances. The resultant combined allowable load shall be divided among the various discharges using an allocation method based on site-specific considerations. Whenever the department makes a determination under this section, the department shall notify all permittees who may be affecting the water quality of the same receiving water of the determination and any limitations developed under this section. Permittees shall be given the opportunity to comment to the department on any determination made under this section.

**Note:** The method of allocating the combined allowable load in s. NR 106.11 is not required to be based on the effluent flow rates specified in s. NR 106.06 (4) (d).

**History:** Cr. Register, February, 1989, No. 398, eff. 3-1-89; am. Register, August, 1997, No. 500, eff. 9-1-97.

**NR 106.115 Additivity of dioxins and furans.** The 2,3,7,8-TCDD toxicity equivalence concentration in effluent shall be used when developing waste load allocations and for purposes of establishing water quality based effluent limits.

**(1)** For the chlorinated dibenzo-p-dioxins (CDDs) listed in Tables 8 and 9 in ch. NR 105, the potential adverse additive effects of all dioxin (CDD) and chlorinated dibenzofuran (CDF) congeners in effluents shall be accounted for as specified in this section.

**(2)** The Toxicity Equivalency Factor (TEF) in Table 1 and Bioaccumulation Equivalency Factor (BEF) in Table 2 shall be used when calculating a 2,3,7,8-TCDD toxicity equivalence concentration in effluent to be used when implementing both human health noncancer and cancer criteria. The chemical concentration of each CDD and CDF in effluent shall be converted to a 2,3,7,8-TCDD toxicity equivalence concentration in effluent by using the following equation:

$(TEC)_{tcdd} = \Sigma\ (C)_x\ (TEF)_x\ (BEF)_x$

where:

$(TEC)_{tcdd}$ = 2,3,7,8-TCDD toxicity equivalence concentration in effluent

$(C)_x$ = concentration of total chemical x in effluent

$(TEF)_x$ = TCDD toxicity equivalency factor for x from table 1

$(BEF)_x$ = TCDD bioaccumulation equivalency factor for x from table 2

**Table 1 — Toxicity Equivalency Factor for CDDS and CDFs**

| Congener | TEF |
|---|---|
| 2,3,7,8-TCDD | 1.0 |
| 1,2,3,7,8-PeCDD | 0.5 |
| 1,2,3,4,7,8-HxCDD | 0.1 |
| 1,2,3,6,7,8-HxCDD | 0.1 |
| 1,2,3,7,8,9-HxCDD | 0.1 |
| 1,2,3,4,6,7,8-HpCDD | 0.01 |
| OCDD | 0.001 |
| 2,3,7,8-TCDF | 0.1 |
| 1,2,3,7,8-PeCDF | 0.05 |
| 2,3,4,7,8-PeCDF | 0.5 |
| 1,2,3,4,7,8-HxCDF | 0.1 |
| 1,2,3,6,7,8-HxCDF | 0.1 |
| 2,3,4,6,7,8-HxCDF | 0.1 |
| 1,2,3,7,8,9-HxCDF | 0.1 |
| 1,2,3,4,6,7,8-HpCDF | 0.01 |
| 1,2,3,4,7,8,9-HpCDF | 0.01 |
| OCDF | 0.001 |

**Table 2 — Bioaccumulation Equivalency Factor for CDDs and CDFs**

| Congener | BEF |
|---|---|
| 2,3,7,8-TCDD | 1.0 |
| 1,2,3,7,8-PeCDD | 0.9 |
| 1,2,3,4,7,8-HxCDD | 0.3 |
| 1,2,3,6,7,8-HxCDD | 0.1 |
| 1,2,3,7,8,9-HxCDD | 0.1 |
| 1,2,3,4,6,7,8-HpCDD | 0.05 |
| OCDD | 0.01 |
| 2,3,7,8-TCDF | 0.8 |
| 1,2,3,7,8-PeCDF | 0.2 |
| 2,3,4,7,8-PeCDF | 1.6 |
| 1,2,3,4,7,8-HxCDF | 0.08 |
| 1,2,3,6,7,8-HxCDF | 0.2 |
| 2,3,4,6,7,8-HxCDF | 0.7 |
| 1,2,3,7,8,9-HxCDF | 0.6 |
| 1,2,3,4,6,7,8-HpCDF | 0.01 |
| 1,2,3,4,7,8,9-HpCDF | 0.4 |
| OCDF | 0.02 |

**History:** Cr. Register, August, 1997, No. 500, eff. 9-1-97; CR 03-050: renum. from NR 106.16 Register February 2004 No. 578, eff. 3-1-04; CR 09-123: am. (1) Register July 2010 No. 655, eff. 8-1-10; CR 15-085: am. Table 1 (title), Table 2 (title) Register August 2016 No. 728, eff. 9-1-16.

**NR 106.117 Schedules of compliance. (1)** SCHEDULES FOR FIRST PERMIT ISSUANCE. (a) In this subsection, the following definitions apply:

1. "New source" has the meaning given in 40 CFR 122.2.
2. "New discharger" has the meaning given in 40 CFR 122.2.
3. "Recommencing discharger" means a permitted source that recommences discharge after terminating its operations.

(b) The first permit issued by the department to a new source or a new discharger shall contain a schedule of compliance only when necessary to allow a reasonable opportunity to attain compliance with state or federal limitations promulgated after commencement of construction but less than 3 years before commencement of the discharge.

**Note:** The department recognizes pollution control equipment start-up problems may arise at the commencement of a new discharge. Enforcement discretion may be used in the 90 days following commencement of discharge, in such cases.

(c) For recommencing dischargers, a schedule of compliance shall be included in the permit only when necessary to allow a reasonable opportunity to attain compliance with limitations promulgated less than 3 years before recommencement of the discharge.

**(2)** SCHEDULES FOR REISSUED OR MODIFIED PERMITS. A reissued or modified permit may, when appropriate, include a schedule for compliance with new or more stringent effluent limitations that are established by this chapter.

**(3)** SCHEDULE REQUIREMENTS. A schedule of compliance included in a permit shall meet all of the following conditions:

(a) *Time for compliance.* Any schedule of compliance under this section shall require compliance as soon as possible but may not extend beyond any applicable federal or state statutory deadlines. The schedule also may not extend beyond 5 years from the date that the permit is reissued or modified to include the new or more stringent effluent limitation, except as provided in par. (b) or as provided in other chapters.

(b) *Great Lakes dischargers.* For an existing discharger to the Great Lakes system with a permit that was originally issued before March 23, 1997, if the effluent limitation is based on a secondary value under s. NR 105.03 (25), the permit shall require compliance with the secondary value based limitation within a reasonable period of time, no later than 5 years after permit reissuance or modification to include the limitation. The compliance schedule may allow the permittee additional time to conduct studies for the purpose of revising the secondary value or to develop a criterion if requested by the permittee in accordance with s. NR 106.07 (8). The time period allowed for such studies may not exceed 2 years. In cases where the permittee wishes to conduct a study on the secondary value, the permit also shall contain a reopener clause, requiring a permit modification if the department determines the specified studies demonstrate that a revised limitation is appropriate. Any revised limitation shall be incorporated through a permit modification and a reasonable time period, up to 5 years, may be allowed for compliance, but in no case may the compliance schedule for the revised limitation extend beyond 7 years from the date the secondary value based limitation was initially included in the permit.

(c) *Interim dates.* If a permit establishes a schedule of compliance that exceeds one year from the date of permit reissuance or modification, the schedule shall set forth interim requirements and the dates for their achievement as follows:

1. The time between dates for the achievement of interim requirements may not exceed one year, except in the case of a schedule for compliance with standards for sewage sludge use and disposal, the time between dates for the achievement of interim requirements shall not exceed 6 months.

2. If the time necessary for completion of any interim requirement is more than one year and is not readily divisible into stages for completion, the permit shall specify dates for the submission of reports of progress toward completion of the interim requirements and indicate a projected completion date.

(d) *Pollution and waste minimization measures.* The schedule of compliance may require the permittee to evaluate pollution and waste minimization measures as a means for complying with the effluent limitation.

(e) *Extension beyond permit expiration.* If a permit is modified to include a limitation, the schedule of compliance may extend beyond the expiration date of the permit if an interim permit limit that is effective upon the permit's expiration date is included in the permit. In such cases, the department shall also specify in the permit the final water quality based effluent limit and its effective date.

(f) *Reporting.* No later than 14 days following each interim date and the final date of compliance, the permittee shall notify the department in writing of its compliance or noncompliance with the interim or final requirements or, if par. (c) 2. is applicable, submit progress reports.

**Note:** An interim permit requirement is not necessarily a numerical effluent limitation.

**Note:** Compliance schedule provisions for TMDL-based limits, technology-based limits, and phosphorus limits may differ from the requirements of this section. These provisions may be found in ss. NR 212.75 (5), 205.14, and 217.17, respectively

**History:** Cr. Register, August, 1997, No. 500, eff. 9-1-97; CR 03-050: renum. from NR 106.17 Register February 2004 No. 578, eff. 3-1-04; CR 17-002: r. and recr. Register April 2018 No. 748, eff. 5-1-18.

**NR 106.14 Analytical methods and laboratory requirements. (1)** Methods used for analysis of samples shall be those specified in ch. NR 219 unless alternative methods are specified in the WPDES discharge permits. Where more than one approved analytical method for a pollutant exists, the department may specify in the permit which method shall be used.

**(2)** The permittee shall submit, with all monitoring results, appropriate quality control information, as specified by the department.

**(3)** The permittee shall report numerical values for all monitoring results greater than the limit of detection, as determined by a method specified by the department, unless analyte-specific instructions in the WPDES permit specify otherwise. The permittee shall appropriately identify all results greater than the limit of detection but less than the limit of quantitation.

**History:** Cr. Register, February, 1989, No. 398, eff. 3-1-89; renum. NR 106.14 to be (1), cr. (2) and (3), Register, August, 1997, No. 500, eff. 9-1-97.

## Subchapter III — Effluent Limitations for Mercury Discharges

**NR 106.145 Mercury regulation.** This section provides an alternative means of regulating mercury in WPDES permits through the establishment of alternative mercury effluent limitations and other requirements and is intended as a supplement to the authority and procedures contained in other sections of this chapter. For purposes of this section, an alternative mercury effluent limitation represents a variance to water quality standards specified in chs. NR 102 to 105.

**(1)** FINDINGS. On November 1, 2002, the department finds all of the following:

(a) Requiring all dischargers of mercury to remove mercury using wastewater treatment technology to achieve discharge concentrations necessary to meet water quality standards would result in substantial and widespread adverse social and economic impacts.

(b) Representative data on the relatively low concentrations of mercury in wastewater are difficult to obtain due to specialized sample collection methods required and the precision and sensitivity of laboratory analyses.

(c) Appropriate mercury source reduction activities are environmentally preferable to wastewater treatment technology in many cases because wastewater treatment for mercury produces a sludge or other resultant wastewater stream that can be as much or more of an environmental liability than the untreated effluent.

**(2)** DETERMINING THE NECESSITY FOR MERCURY EFFLUENT LIMITATIONS. (a) The department shall determine whether a mercury effluent limitation is necessary using the procedures in s. NR 106.05.

(bm) For the determination under par. (a), the department shall use representative data that meet the sampling and analysis requirements of subs. (9) and (10).

**(3)** DATA GENERATION. (a) In this paragraph, "major municipal discharge" and "minor municipal discharge" have the meanings specified in s. NR 200.02 (7) and (8). If an applicant in any of the categories specified in this subsection does not have sufficient discharge data that meet the criteria of sub. (2) at the time of application for permit reissuance, the reissued permit shall require the permittee to monitor and report mercury at the following frequency and location:

1. Monthly influent and effluent for a major municipal discharge with an average flow rate greater than or equal to 5 million gallons per day.

2. Once every 3 months influent and effluent for a major municipal discharge with an average flow rate greater than or equal to one million gallons per day but less than 5 million gallons per day.

3. Once every 3 months influent and effluent for a minor municipal discharge if there are 2 or more exceedances in the last 5 years of the high quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07 (5).

4. Monthly effluent for an industrial discharge that the department determines is likely to contribute net discharges of mercury to the environment or if sludge or biosolids mercury concentrations indicate a source of mercury.

5. Once every 3 months effluent for an industrial discharge with an average flow rate, excluding noncontact cooling water as defined in s. NR 205.03 (21), of more than 100,000 gallons per day and the department has no information on mercury concentrations in similar discharges. The department may exempt discharges in this category if the department determines that there is little risk that the effluent will contain mercury.

**Note:** Any permittee who believes that a significant portion of the mercury in its effluent originates from its intake of surface water is encouraged to provide results of intake monitoring.

6. The department may reduce monitoring frequency from monthly to once every 3 months for discharges described in subds. 1. and 4. after at least 12 representative results have been generated.

(b) The department may require mercury monitoring for other discharges not included in one of the categories specified in par.

(a) if the department has a reasonable expectation that the discharge includes significant quantities of mercury.

(c) Permittees shall collect and analyze samples according to the requirements in subs. (9) and (10).

**(4)** ALTERNATIVE MERCURY EFFLUENT LIMITATION ELIGIBILITY. (a) When the department makes a determination of the necessity for a water quality based effluent limitation for mercury under sub. (2), the department shall determine if an alternative mercury effluent limitation is justified based on information submitted by the permittee in an alternative mercury effluent limitation application.

(b) The department may not establish an alternative mercury effluent limitation for a new discharge to waters in the Great Lakes system, as defined in s. NR 102.12 (1), unless the proposed discharge is necessary to alleviate an imminent and substantial danger to the public health or welfare. For the purposes of this section, a new discharger is any building, structure, facility or installation from which there is or may be a discharge of pollutants, as defined in s. NR 200.02 (4), the construction of which commenced after November 1, 2002. An existing discharger that relocates its outfall after November 1, 2002 may not be considered a new discharger for purposes of this paragraph. Relocation includes the diversion of a discharge from a land treatment system or systems to a surface water.

(c) The term of an alternative mercury effluent limitation may not extend beyond the term of the permit.

(d) An alternative mercury effluent limitation may be renewed using the procedures and requirements in subs. (5) to (8). An alternative mercury effluent limitation may not be renewed if the permittee did not substantially comply with all of the mercury-regulation conditions of the previous permit.

**(5)** CALCULATION OF AN ALTERNATIVE MERCURY EFFLUENT LIMITATION. (a) An alternative mercury effluent limitation shall equal the upper 99$^{th}$ percentile of representative daily discharge concentrations as calculated under s. NR 106.05 (4) (a), except as provided in par. (c).

(b) The alternative mercury effluent limitation shall be expressed as a daily maximum concentration.

(c) An alternative mercury effluent limitation may not be greater than the alternative mercury effluent limitation contained in the previous permit, unless the permittee demonstrates that the previous alternative mercury effluent limitation was based on monitoring that did not represent actual discharge concentrations.

**(6)** DEPARTMENT ACTION ON ALTERNATIVE MERCURY EFFLUENT LIMITATION APPLICATIONS. (a) The department shall establish an alternative mercury effluent limitation for a discharger when all of the following have been met:

1. The information provided in the alternative mercury effluent limitation application described in sub. (8) supports establishing the alternative mercury effluent limitation.

2. The permittee and the department agree upon the alternative mercury effluent limitation and the specific permit language requiring implementation of the pollution minimization program described in sub. (7).

(b) If the information provided in the alternative mercury effluent limitation application does not support establishing an alternative mercury effluent limitation or if the department and the permittee cannot agree on the alternative mercury effluent limitation and the specific permit language incorporating the pollutant minimization program, the department shall include the water quality based effluent limitation or limitations in the permit. This paragraph does not prohibit the department from seeking and the applicant providing supplemental information after the initial application is submitted.

(c) If the department grants an alternative mercury effluent limitation, the permit shall require monitoring subject to the data quality requirements of subs. (9) and (10), at the following locations:

1. Effluent for both municipal and industrial discharges.

2. Influent and sludge or biosolids for major and minor municipal discharges.

**(7)** POLLUTANT MINIMIZATION PROGRAMS. (a) If the department grants an alternative mercury effluent limitation under sub. (6), the reissued permit shall require the permittee to implement a pollutant minimization program as defined in s. NR 106.04 (5) and detailed for mercury in this subsection.

(b) If the reissued permit requires monthly data generation under sub. (3) (a) 1. or 4., the permit shall contain a special condition that triggers a pollutant minimization program if the first 24 months of data demonstrate that a limit will be necessary under sub. (2). The permit shall also require that the permittee do all of the following:

1. Submit to the department within 36 months of permit reissuance a pollutant minimization program plan meeting the requirements specified in this subsection.

2. Implement the pollutant minimization program following submittal of the plan.

3. Submit the first annual status report required in par. (g) within 48 months of permit reissuance.

(c) For municipal permittees, a pollutant minimization program shall consist of all of the following elements:

1. Source identification.

2. Activities to help educate the general public, health professionals, school teachers, laboratory personnel or other professionals about ways to reduce use of mercury-containing products, recycle mercury-containing products and prevent spills.

3. A program for collecting mercury from the permittee's sewer system users. This program may be independently operated by the permittee, jointly by the permittee and others or by another governmental unit.

4. Other activities that the department, in consultation with the permittee, deems appropriate for the individual permittee's circumstances.

(d) For industrial permittees, a pollutant minimization program may consist of any of the following elements:

1. Source identification and inventory.

2. Improvement of operational, maintenance or management practices.

3. Substitution of raw materials or chemical additives with low-mercury alternatives.

4. Institution of alternative processes.

(e) In assessing the appropriate elements for a pollutant minimization program, the department may consider any of the following:

1. The type of discharger.

2. The operations that generate the wastewater.

3. The level of mercury in the effluent, influent and biosolids or sludge.

4. The costs of potential source reduction measures.

5. The environmental costs and benefits of the pollutant minimization program elements.

6. The characteristics of the community in which the discharger is located.

7. The opportunities for material substitution.

8. The opportunities available for support from or cooperation with other organizations.

9. The actions the discharger has taken in the past to reduce mercury use or discharges.

10. Any other relevant information.

(f) The pollutant minimization program plan shall include all of the following:

1. Identify specific activities to be undertaken and a relative timeline to implement those activities.

2. State which, if any, activities have already been implemented and how effective they were in reducing potential and actual mercury discharges.

3. Commit the permittee to document how the pollutant minimization program plan was implemented including measures such as the number of contacts of various types made, programs implemented and other activities.

4. Provide for steps to measure the effectiveness of the pollution minimization program elements in reducing potential and actual mercury discharges. Where the permittee regularly monitors influent, effluent, sludge or biosolids for mercury, measures shall include any changes in mercury concentrations over comparable historic data. Where practicable, other measures or estimates of mercury reductions from programs such as mercury recycling, collection or disposal may also be included.

(g) Within 12 months of the beginning of implementation of the pollutant minimization program and annually thereafter, the permittee shall report to the department on the progress of the pollutant minimization program as required in s. NR 106.04 (5). This annual report shall include all of the following:

1. An evaluation of the effectiveness of the program in accordance with the plan.

2. Identification of barriers that have limited program effectiveness and adjustments to the program that will be implemented during the next year to help address these barriers.

(h) Permittees may collaborate with one another or other parties to plan and implement a pollutant minimization program.

**Note:** Permittees that do not prepare or effectively implement a pollutant minimization program are subject to regulatory requirements for mercury, without alternative mercury effluent limitations to water quality standards. For municipal permittees this may mean development and enforcement of mercury discharge standards for users of the public sewerage system pursuant to s. NR 211.10 (3). For users of the municipal sewerage system this may mean changes in processes, installation of treatment technology, or other means to comply with the municipal mercury discharge standards pursuant to s. NR 211.10 (1). Implementation of the municipal mercury discharge standards may require a program of user discharge permits and wastewater discharge monitoring.

**(8)** ALTERNATIVE MERCURY EFFLUENT LIMITATION APPLICATIONS. (a) To apply for an alternative mercury effluent limitation under this section, a permittee shall do all of the following:

1. Submit an alternative mercury effluent limitation application at the same time as the application for permit reissuance following data generation.

2. State the basis for concluding that wastewater treatment technology for mercury is impractical.

3. Supply representative effluent monitoring results of sufficient number and analytical sensitivity to quantify with reasonable certainty the concentration and mass of mercury discharged. Representative sample results shall meet all of the following requirements:

a. Be of sufficient quantity to allow calculation of the upper 99$^{th}$ percentile values pursuant to s. NR 106.05 (5).

b. Reasonably represent current conditions.

c. Meet the data quality requirements of subs. (9) and (10).

d. Represent a time period of at least 2 years.

4. Submit a pollution minimization program plan described in sub. (7) (f).

(b) A permittee applying for renewal of an alternative mercury effluent limitation previously granted shall follow the procedures in par. (a) except for all of the following:

1. The permittee shall submit information indicating whether the permittee substantially complied with mercury regulation conditions of the existing permit.

2. A new pollutant minimization program plan shall re-evaluate the plan required under the previous permit.

**(9)** SAMPLING REQUIREMENTS. (a) Sample types may be grab or 24-hour composite. "Grab sample" and "24-hour composite sample" have the meanings specified in s. NR 218.04.

(b) Sample collection methods shall be consistent with *EPA Method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Level*s, EPA-821-R-96-011.

(c) Requirements for field blanks are as follows. A field blank means an aliquot of mercury-free reagent water that is placed in a sample container, shipped to the field and treated as a sample in all respects, including contact with the sampling devices and exposure to sampling site conditions, filtration, storage, preservation, and all analytical procedures. The purpose of the field blank is to determine whether the field or sample transporting procedures and environments have contaminated the sample:

1. At least one field blank shall be collected at each site for each day a sample is collected. If more than one sample is collected in a day, at least one field blank for each 10 samples collected on that day shall be collected.

2. If mercury or any potentially interfering substance is found in the field blank at a concentration equal to or greater than 0.5 ng/L, the limit of detection or one-fifth the level in the associated sample, whichever is greater, results for associated samples may not be used for regulatory compliance purposes unless the conditions in subd. 3. are met.

3. If at least 3 field blanks are collected on a day when samples are collected and the average mercury concentration of the field blanks plus 2 standard deviations is less than or equal to one-half of the level in the associated sample or less than the lowest water quality criterion for mercury found in ch. NR 105, whichever is greater, results may be used.

**Note:** As of November 1, 2002 the lowest water quality criterion listed in ch. NR 105 is 1.3 ng/L.

4. Once a permittee demonstrates the ability to collect samples from a given site using an established procedure that meets the use-criteria of subd. 2., the permittee may decrease the number of field blanks to no fewer than one field blank for each 4 sampling days.

a. The initial demonstration shall consist of at least 6 consecutive sampling days.

b. If the permittee makes significant changes to the sampling procedure or sampling personnel, the 6-day demonstration shall be repeated.

c. If after reducing the field blank frequency, a field blank fails to meet the use-criteria, the permittee shall take corrective action and return to collecting field blanks on each sampling day until it can meet the use-criteria for at least 3 consecutive sampling days.

d. In no case may the permittee decrease field blanks to fewer than one for each 10 samples.

5. The permittee shall report, but may not subtract, field blank concentrations when reporting sample results.

**Note:** When using the data, the department may subtract field blanks from sample concentrations on a case-by-case basis.

**(10)** LABORATORY ANALYSIS REQUIREMENTS. (a) In this

subsection, "method blank" and "limit of detection" have the meanings specified in s. NR 149.03.

**Note:** "Matrix spike" has the meaning specified in EPA Method 1631, Revision E: Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry, August 2002, Office of Water, EPA-821-R-02-019.

(b) The analytical method used shall be sensitive enough to quantify mercury concentrations in the sample or mercury concentrations down to the lowest water quality criterion found in ch. NR 105, whichever is greater.

(c) The department may exempt a permittee from the sensitivity requirement in par. (b) if the permittee can demonstrate to the department's satisfaction that the specific effluent matrix does not allow this level of sensitivity using the most sensitive approved method with all reasonable precautions.

(d) The laboratory performing the analyses shall be certified for mercury under the cold vapor atomic fluorescence spectrophotometry technology of ch. NR 149.

(e) Method blanks analyzed concurrently with samples shall be reported with sample results. Method blanks may be subtracted from sample results unless concentrations of mercury in the method blank exceed the laboratory's limit of detection, 0.5 ng/L or 5% of the sample concentration, whichever is greater.

(f) Matrix spikes analyzed concurrently with samples shall have recoveries between 71 and 125%.

**(11)** DATA REJECTION. The department may reject any sample results if data quality requirements specified in subs. (9) and (10) are not met or if results are produced by a laboratory that is not in compliance with requirements specified in ch. NR 149.

**(12)** APPLICABILITY OF THE VARIANCE PROCESS UNDER S. 283.15, STATS. If a water quality based effluent limitation is included in a permit under sub. (6) (b), a permittee may apply to the department for a variance from the water quality standard used to derive the limitation following the procedure specified in s. 283.15, Stats. Where a permittee has been granted an alternative mercury effluent limitation under this section, the procedures of s. 283.15, Stats., are not applicable.

**History:** CR 02-019: cr. Register October 2002 No. 562, eff. 11-1-02; corrections in (10) (d) made under s. 13.92 (4) (b) 7., Stats., Register July 2010 No. 655; CR 15-084; am. (1) (b), (2) (title), consol. (2) (b) (intro.) and 1. and renum. (2) (bm) and am., r. (2) (b) 2. Register August 2016 No. 728, eff. 9-1-16; CR 17-046: am. (10) (a), (d), (11) Register February 2021 No. 782, eff. 6-29-21.

**NR 106.15 Limitations for mercury.** Regardless of the effluent limitations determined under this chapter, the discharge of organic mercury compounds, inorganic mercury compounds, and metallic mercury shall not exceed the requirements in s. 281.17 (7), Stats., and ch. NR 100.

**History:** Cr. Register, February, 1989, No. 398, eff. 3-1-89.

## Subchapter IV — Effluent Limitations for Ammonia Discharges

**NR 106.30 Applicability.** The provisions of this subchapter are applicable to point sources that discharge wastewater containing ammonia to surface waters of the state. This subchapter first applies to permits issued or reissued after March 1, 2004.

**Note:** Any discharges of ammonia from a concentrated animal feeding operation (CAFO) are regulated under ch. NR 243.

**History:** CR 03-050: cr. Register February 2004 No. 578, eff. 3-1-04.

**NR 106.31 Definitions.** In this subchapter:

**(1)** "Acute criterion" or "ATC" has the meaning in s. NR 105.03 (2)

**(2)** "Chronic criterion" or "CTC" has the meaning in s. NR 105.03 (15)

**(3)** "Early life stages" or "ELS" means the life stages of fish that include the pre-hatch embryonic period, post-hatch free embryo or yolk-sac fry, and the larval period, during which the fish feeds. Juvenile fish, which are anatomically similar to adults, are not considered an early life stage. The duration of the early life stage extends from the beginning of spawning through the end of the larval period.

**(4)** "Early life stages absent" means the early life stages of fish are not present in a water body affected by a permittee's discharge.

**(5)** "Early life stages present" means the early life stages of fish are present in a water body affected by a permittee's discharge.

**(6)** "Lagoon system" means a wastewater treatment system where the method of treatment consists of intermediate-depth basins with typical detention times of 30 to 60 days and generally a continuous discharge. Sufficient aeration is provided to help satisfy oxygen demand, but not provide for complete mixing.

**(7)** "Real-time" means an event that is occurring during a present point in time.

**(8)** "Stabilization pond" means a wastewater treatment system consisting of large shallow earthen basins that use algae and aerobic, facultative, and anaerobic organisms for wastewater treatment. Stabilization ponds include, but are not limited to, those sized for a minimum of 150 days storage and have discharges in the spring and fall.

**(9)** "WPDES" or "WPDES permit" means Wisconsin pollutant discharge elimination system permit under ch. 283, Stats.

**History:** CR 03-050: cr. Register February 2004 No. 578, eff. 3-1-04.

**NR 106.32 Calculation of water quality-based effluent limitations for ammonia. (1)** BASIS FOR LIMITATIONS. (a) The department shall establish water quality based effluent limitations for point source dischargers of ammonia whenever the limitations are necessary, as determined by any method in this section, to meet the applicable water quality standards and criteria in chs. NR 102 to 105.

(b) Water quality based effluent limitations for ammonia shall be determined to attain and maintain water quality standards and criteria specified in or determined according to procedures in ch. NR 105, at the point of discharge. Effluent limitations shall be established to protect downstream waters whenever the department has information to make the determinations.

**(2)** LIMITATIONS BASED ON ACUTE TOXICITY. (a) The department shall establish daily maximum water quality based effluent limitations to ensure that ammonia is not present in amounts that are acutely harmful to aquatic life in all surface waters, including those portions of the mixing zone normally habitable by aquatic life as required by s. NR 102.04 (1).

(b) To assure compliance with par. (a) and except as provided in pars. (c) and (e), water quality-based effluent limitations for ammonia shall equal the final acute value as determined in s. NR 105.05 for the respective fish and aquatic life subcategory for which the receiving water is classified. The water quality-based limitations based on acute toxicity shall be established using all of the following methods:

1. Effluent limitations for ammonia for discharges to water bodies classified as cold water communities shall be established using the ammonia criteria for the CW Category 1, shown in ch. NR 105, Table 2C, except as provided in subd. 2.

2. If the permittee can demonstrate to the department through site specific information that the fish present in the receiving water are limited to those included in CW Category 2, CW Category 3, or CW Category 5, as described in ch. NR 105, Table 2C, then effluent limitations shall be established based on the criteria shown in ch. NR 105 Table 2C for the respective CW

Category. If the department grants approval for an alternative limitation based on CW Category 2, 3, or 5, the department shall include the alternative limit in a modified or reissued permit provided antidegradation requirements in ch. NR 207 have been satisfied.

3. In all cases, effluent limitations for ammonia for discharges directly to Lake Superior, Lake Michigan and Green Bay north of 44° 32' 30" north latitude shall be established using the ammonia criteria for the CW Category 1 shown in ch. NR 105, Table 2C.

(c) Water quality based effluent limitations for ammonia may exceed the final acute value within a zone of initial dilution that meets all of the conditions in s. NR 106.06 (3) (c).

(d) Effluent limitations for ammonia shall be calculated using the pH value of the effluent as determined in sub. (4) (b) and this paragraph. The department may also establish effluent limitations or other requirements for pH according to the following procedure:

1. Whenever the department establishes an effluent limitation based on the acute ammonia criteria in ch. NR 105, the department may also establish a maximum effluent limitation for pH equal to the pH value that was used to calculate the ammonia effluent limitation.

2. The department may allow a permittee to chemically adjust effluent pH to a lower value for the purpose of obtaining a higher ammonia effluent limitation. The adjusted pH shall be used to calculate the ammonia effluent limitation. The pH value of an effluent may not be adjusted to less than 6.0. Whenever the effluent pH is adjusted, the department may require continuous monitoring of the pH of the effluent.

3. The department may establish an alternative pH for calculating the limitation under this section to protect downstream uses whenever the receiving water pH is significantly different from the effluent, or if a zone of initial dilution is applicable based on par. (c).

(e) To assure compliance with par. (a), the department may calculate acute water quality-based effluent limitations using the following procedure if the department concludes that limitations calculated in par. (b) or (c) are not sufficiently protective of fish and aquatic life. The department may include the calculated WQBEL in a permit if this limitation is more stringent than the limitation calculated in par. (b) or (c):

$$\text{Limitation} = \frac{(WQC)\,(Qs+(1-f)Qe) - (Qs- fQ_e)\,(Cs)}{Qe}$$

Where:

WQC = The acute ammonia toxicity criterion appropriate for the receiving water as specified in ch. NR 105 and par. (d).

$Q_s$ = Receiving water design flow (in units of volume per unit time) as defined in s. NR 106.06 (3) (bm)

$Q_e$ = Effluent flow (in units of volume per unit time) as specified in s. NR 106.06 (4) (d).

f = Fraction of the effluent flow that is withdrawn from the receiving water, and

Cs = Background concentration of the substance (in units of mass per unit volume) as specified in s. NR 106.06 (4) (e).

**(3)** LIMITATIONS BASED ON CHRONIC TOXICITY OR LONG-TERM IMPACTS. (a) *Water quality criteria.* The department shall calculate water quality based effluent limitations for ammonia to ensure that the chronic toxicity criteria applicable to the receiving water as specified in chs. NR 102 to 105 will be met after taking into account dilution with an appropriate quantity of receiving water flow allowed in this subsection. The available dilution shall be determined according to par. (c) unless the conditions specified in s. NR 102.05 (3) require less dilution or no dilution be allowed. The chronic toxicity criteria to be used in the calculation of ammonia effluent limitations shall apply as follows:

1. The applicable early life stages present ammonia criteria in s. NR 105.05 Table 4B shall be used to calculate effluent limitations for all times of the year for all discharges to Class I and Class II trout waters, as identified by the department's Wisconsin Trout Streams publication referenced in s. NR 102.04 (3) (a), and any additional Class I and Class II trout waters identified in ss. NR 102.10 (1) (d) and (e), and 102.11 (1) (b) and (c).

2. The applicable early life stages present ammonia criteria in s. NR 105.05 Table 4B shall be used to calculate effluent limitations for all discharges to all waters supporting warm water sport fish and warm water forage fish during the month of April or whenever the receiving water temperature, as determined in s. NR 106.32 (4), is greater than or equal to 14.6 degrees Celsius.

**Note:** Effluent limitations are determined based on monthly average water temperatures determined from historical records. For many waters supporting warmwater fish species, the monthly average water temperature is 14.6 degrees Celsius or greater during the months of May through September.

3. Except as provided in subd. 4., the applicable early life stage absent ammonia criteria in s. NR 105.05 Table 4B shall be used to calculate effluent limitations for all discharges to all waters supporting warm water sport fish and warm water forage fish whenever the receiving water temperature, as determined in s. NR 106.32 (4), is less than 14.6 degrees Celsius, but not including the month of April.

4. The applicable early life stages present ammonia criteria in s. NR 105.05 Table 4B shall be used to calculate effluent limitations applicable for the months of January, February, and March for all discharges to waters where the department determines that early life stages of burbot are present.

**Note:** Burbot are not present in limited aquatic life streams, limited forage fish streams and small or shallow headwater streams and rivers.

a. Whenever the department determines that early life stage present ammonia criteria are applicable under this subdivision, the permittee may make a demonstration that the early life stages of burbot are not present at the discharge location and will not be affected by the discharge during the months of January and February. If the department grants approval for an alternative limitation based on results of this study, the department shall include the alternative limitation in a permit modification or reissuance provided antidegradation requirements in ch. NR 207 have been satisfied.

b. If the permittee can demonstrate to the satisfaction of the department that the early life stages of burbot are not present at the discharge location and will not be affected by the discharge, the early life stage absent ammonia criteria in s. NR 105.05 Table 4B shall be used to calculate effluent limitations that apply to the permittee and the department shall propose a permit modification to incorporate the limitations. If the permittee does not make a sufficient demonstration, the early life present ammonia criteria in s. NR 105 Table 4B shall apply.

5. The applicable early life stages present ammonia criteria in s. NR 105.05 Table 4B shall be used to calculate effluent limitations for the months of May through September for all discharges to waters designated in ch. NR 104 as limited forage fish waters. The early life stages absent ammonia criteria in s. NR 105.05 Table 4B shall be used to calculate effluent limitations for the months of October through April for all discharges to waters designated in ch. NR 104 as limited forage fish waters.

6. The applicable ammonia criteria in s. NR 105.05 Table 4B shall be used to calculate effluent limitations for all discharges to waters designated in ch. NR 104 as limited aquatic life waters.

(b) *Calculation of limits.* Water quality based effluent limitations to meet the requirements of this subsection shall be calculated using the procedure specified in subd. 1. or 2., except as provided in s. NR 106.06 (6).

1. For discharges of ammonia to flowing receiving waters, the water quality based effluent limitation shall be calculated using the following conservation of mass equation whenever the background concentration is less than the water quality criterion:

$$\text{Limitation} = \frac{(CTC)\,(Q_s + (1\text{-}f)Q_e) - (Q_s - fQ_e)\,(C_s)}{Q_e}$$

Where:

| | |
|---|---|
| Limitation = | Water quality based effluent limitation (in units of mass per unit of volume) |
| CTC = | The chronic toxicity criterion (concentration in units of mass per unit volume) as referenced in par. (a) |
| $Q_s$ = | Receiving water design flow (in units of volume per unit time) as specified in par. (c) |
| $Q_e$ = | Effluent flow (in units of volume per unit time) as specified in par. (d) |
| f = | Fraction of the effluent flow that is withdrawn from the receiving water |
| $C_s$ = | Background concentration of ammonia (in units of mass per unit volume) as specified in par. (e) |

**Note:** In applying this equation, all units for the flow and concentration parameters respectively shall be consistent.

2. For discharges of ammonia to receiving waters which do not exhibit a unidirectional flow at the point of discharge, such as lakes or impoundments, the department may calculate, in the absence of specific data, water quality based effluent limitations using the following equation whenever the background concentration is less than the water quality criterion:

$$\text{Limitation} = 11\,(CTC) - 10C_s$$

Where:

| | |
|---|---|
| Limitation = | Water quality based effluent limitation (in units of mass per unit of volume) |
| CTC = | The chronic toxicity criterion (concentration in units of mass per unit volume) as referenced in par. (a) |
| $C_s$ = | Background concentration of ammonia (in units of mass per unit volume) as specified in par. (e) |

3. On a case-by-case basis other dilutional factors may be used, but in no case may the dilution allowed exceed an area greater than the area where discharge induced mixing occurs. The discharge is also subject to the conditions specified in s. NR 102.05 (3). The permittee may be required to determine the size of the mixing zone using models or dye studies that are determined to be acceptable by the department.

(c) *Receiving water design flow ($Q_s$).* Subject to the application of the zone of passage factors in subd. 3. or 4., the value of $Q_s$ to be used in calculating the effluent limitation for discharges to flowing waters shall be determined using one of the approaches in subd. 1. or 2.

1. To calculate limits based on 4-day chronic ammonia criteria, $Q_s$ shall equal the average minimum 7-day flow which occurs once in 10 years (7-day $Q_{10}$) or, if sufficient information is available to calculate a biologically based receiving water design flow, the flow which prevents an excursion from the criterion using a duration of 4 days and a frequency of less than once every 3 years (4-day, 3-year biological flow). To calculate limits based on 30-day chronic ammonia criteria, $Q_s$ shall equal the average minimum 30-day flow which occurs once in 5 years (30-day $Q_5$) or 85% of the average minimum 7-day flow which occurs once in 2 years (7-day $Q_2$).

2. If approved by the department, the value of $Q_s$ of the receiving water for calculating effluent limitations based upon the chronic toxicity criteria specified in s. NR 105.06 may be determined on a case-by-case basis, using historical flow data or real time data. $Q_s$ may be based on real-time streamflow data if the permittee demonstrates that modifications to effluent quality or quantity can be achieved in response to changing stream conditions. Appropriate modifications to effluent quality or quantity may include, but are not limited to, land application, storage, shutdown or reduction in ammonia feed rates.

3. To provide for an adequate zone of passage, the value of $Q_s$ to be used in the equation in par. (b) 1. shall be determined by multiplying the applicable value from subd. 1. or 2. by the following zone of passage factors:

a. 0.25 when the receiving water temperature is less than 11 degrees Celsius.

b. 0.50 when the receiving water temperature is equal to or greater than 11 degrees Celsius and equal to or less than 16 degrees Celsius.

c. 1.00 when the receiving water temperature is greater than 16 degrees Celsius.

4. Based on the zone of passage or rapid dilution demonstration in this subdivision, the department may determine that alternative zone of passage factors to those provided in subd. 3. apply. The permittee may demonstrate, through appropriate and reasonable methods approved by the department, and by using information on the mixing and dilution characteristics of the discharge, that an adequate zone of free passage exists in the cross-section of the receiving water or that dilution is accomplished rapidly such that the extent of the mixing zone is minimized. In complex situations, the department may require that the demonstration under this subdivision include water quality modeling or field dispersion studies.

5. The department may adjust $Q_s$ from the values in subd. 1. where natural receiving water flow is significantly altered by flow regulation.

(d) *Effluent flows ($Q_e$).* Effluent flows used in the calculation of ammonia limits shall be determined using the procedures in s. NR 106.06 (4) (d).

(e) *Background concentrations of ammonia ($C_s$).* Background ammonia concentrations used in the calculation of ammonia limits shall be determined using the procedures in s. NR 106.06 (4) (e).

**(4)** VALUES FOR PARAMETERS WHICH AFFECT THE LIMIT. Effluent limitations for ammonia shall be based upon the effects of pH and temperature on the toxicity of ammonia. The department shall determine the value of the pH and temperature on a case-by-case basis as follows:

(a) *Receiving water.* 1. The geometric mean of temperature and the arithmetic mean for pH in the receiving water shall be used to establish the chronic toxicity criteria for purposes of determining the effluent limitation for ammonia. Representative seasonal values of pH and temperature may be used. The pH and temperature determined under this subdivision may be modified to account for the mixture of the receiving and effluent flows when either of the following conditions occur:

a. Whenever the value of the pH and temperature of the effluent as determined in par. (b) is significantly greater than or less than the value in the receiving water.

b. Whenever, as a result of demonstrated or measured physical, chemical or biological reactions, the value of the pH and temperature, after mixing of the receiving water and the effluent, is significantly different than the respective background value of the pH and temperature in the receiving water.

2. If information on the pH and temperature of the receiving water is not available, information on the quality of similar water bodies in the area and best professional judgment of the department may be used.

(b) *Effluent.* 1. The daily maximum effluent pH shall be used to calculate the daily maximum ammonia limit based on acute toxicity criteria and in any calculations under par. (a).

2. If information on the effluent pH is not available, then values representative of similar effluents may be used.

(c) A permittee may conduct an investigation to demonstrate that alternate values for the pH and temperature determined under pars. (a) and (b) should be used. The investigation shall be based on site-specific conditions and shall address all of the following: critical loading conditions; buffering capacity of the stream; whether pH changes persist long enough to allow decay of ammonia to non-toxic levels; the effect of seasonal variations; maintaining the pH at the edge of the chronic mixing zone within the range of 6.0 to 9.0; and separate analyses for chronic mixing zone and an acute zone of initial dilution.

**Note:** It is suggested that the permittee submit a plan of study to the department prior to undertaking a demonstration under this paragraph.

(d) *Real-time data.* Effluent limitations may be established based on real-time effluent and stream data provided the permittee demonstrates that the real-time data can be collected, and the discharge can be controlled to attain the effluent limitations. Adjustment of effluent pH may be an appropriate modification for compliance with real-time daily maximum limits. Real-time stream data may not be used to calculate ammonia limits if the department determines that the discharge may affect the existence of any endangered or threatened species listed under ch. NR 27.

**(5)** APPLICATION OF WATER QUALITY BASED AMMONIA LIMITATIONS IN PERMITS AND MONITORING. (a) *Limitations based on acute toxicity criteria.* Effluent limitations for ammonia that are established in permits based on the acute toxicity criteria in ch. NR 105 shall be expressed only as concentrations.

(b) *Limitations based on chronic toxicity criteria.* Effluent limitations for ammonia that are established in permits based on the chronic toxicity criteria in ch. NR 105 shall be expressed as concentrations, except mass limits may also be included in a permit if there is more than one discharger of ammonia at a location or where the discharge is to an exceptional resource water designated under s. NR 102.11 or outstanding resource water designated under s. NR 102.10. If mass limits are determined to be necessary by the department, they shall be calculated using the procedure in s. NR 106.07 (2).

(c) *Maximum and average ammonia limitations.* Effluent limitations based on acute toxicity criteria shall be expressed in permits as daily maximum limitations. Effluent limitations based on 4-day chronic toxicity criteria shall be expressed in permits as weekly average limitations. Effluent limitations based on 30-day chronic toxicity criteria shall be expressed in permits as monthly average limitations.

(d) *Monitoring frequency.* The department shall determine on a case-by-case basis the monitoring frequency for ammonia to be required in a permit.

**History:** CR 03-050: cr. Register February 2004 No. 578, eff. 3-1-04; CR 15-085: am. (2) (b) (intro.), 2., cr. (2) (e), am. (3) (a) 4. a. Register August 2016 No. 728, eff. 9-1-16.

**NR 106.33 Determination of the necessity for water quality-based effluent limits for ammonia. (1)** REASONABLE POTENTIAL. (a) For a permitted discharge that is not already subject to an ammonia water quality-based effluent limitation, the procedures specified in s. NR 106.05 shall be used to determine if water quality-based effluent limitations for ammonia are necessary in a reissued permit. When application of the procedures in s. NR 106.05 results in a determination that ammonia effluent limits are not necessary in a permit, the permit holder shall continue to be operated in a manner that optimizes the removal of ammonia within the design capabilities of the wastewater treatment plant. The department may require that the permittee monitor ammonia at a frequency established on a case-by-case basis in its permit for the purpose of determining representative discharge levels.

(b) If a permittee is subject to an ammonia limitation in an existing permit, the limitation shall be included in any reissued permit. Ammonia limitations shall be included in the permit if the permitted facility will be providing treatment for ammonia discharges.

**(2)** PERMIT LIMITATIONS FOR CONTINUOUS POTWS. The procedures for expressing limitations in permits in this subsection apply to continuous discharges subject to ch. NR 210 when there is reasonable potential under s. NR 106.05 to exceed an ammonia limitation. Both a weekly average and monthly average permit limitations shall be included in a permit for ammonia whenever any water quality-based effluent limitation for ammonia is determined necessary under sub. (1). A daily maximum limitation shall be included in permits in addition to weekly average and monthly average limitations if necessary under sub. (1). The department shall use all of the following procedures to include weekly average and monthly average limitations in permits:

(a) If a daily maximum limitation is the only ammonia limitation determined necessary under sub. (1), a weekly average limitation shall be set equal to the WQBEL based on the 4-day chronic toxicity criteria calculated under s. NR 106.32 (3) or the daily maximum limitation, whichever is more restrictive.

(b) If a weekly average ammonia limitation is determined necessary under sub. (1), and a monthly average limitation is not already determined necessary, a monthly average limitation shall be set equal to the WQBEL based on the 30-day chronic toxicity criteria calculated under s. NR 106.32 (3) or the weekly average limitation, whichever is more restrictive, except as provided under par. (c).

(c) The department may on a case-by-case basis use an alternative methodology for calculating monthly average limitations whenever historical flow data or real time data are used to calculate weekly average limitations under s. NR 106.32 (3) (c) 2. and these limitations are determined to be necessary under sub. (1).

(d) If a monthly average limitation is the only ammonia limitation determined to be necessary under sub. (1), weekly average limitations shall be set equal to the WQBEL based on the 4-day chronic toxicity criteria calculated under s. NR 106.32 (3) or a weekly average limitation calculated using the following procedure, whichever is more restrictive:

Weekly Average Limitation = (Monthly Average Limitation x MF)

Where:

MF = Multiplication factor as defined in s. NR 106.07 (3) (e) (4) Table 1, where

CV = The coefficient of variation (CV) as calculated under s. NR 106.07 (5m)

n = the number of samples per month required in the permit

**(3)** PERMIT LIMITATIONS FOR OTHER CONTINUOUS DISCHARGES. The procedures for expressing limitations in this subsection apply to continuous discharges that are not subject to ch. NR 210 and when there is reasonable potential under s. NR 106.05 to exceed an ammonia limitation. Both a daily maximum and monthly average permit limitation shall be included in a permit for ammonia whenever any water quality-based effluent limitation for ammonia is determined necessary under s. NR 106.05. A weekly average limitation shall be included in permits in addition to a daily maximum and monthly average limitation if necessary under sub. (1). The department shall use all of the following procedures to include daily maximum and monthly average limitations in permits:

(a) If a weekly average limitation is the only ammonia limitation determined necessary under sub. (1), a monthly average limitation shall be set equal to the WQBEL based on the 30-day chronic toxicity criteria or the weekly average limitation, whichever is more restrictive except as provided in par. (c). A daily maximum limitation shall also be included in the permit and set equal to the daily maximum ammonia WQBEL under s. NR 106.32 (2) or a daily maximum limitation calculated using the following procedure, whichever is more restrictive:

Daily Maximum Limitation= Weekly Average Limitation x DMF

Where:

DMF = Daily multiplication factor as defined in NR 106.07 (4) (e) 2. Table 2, where

CV = The coefficient of variation (CV) as calculated in s. NR 106.07 (5m)

(b) If a daily maximum ammonia limitation is determined necessary under sub. (1), and a monthly average limitation is not already determined necessary, a monthly average limitation shall be set equal to the WQBEL based on the 30-day chronic toxicity criteria calculated according to s. NR 106.32 (3) or the daily maximum limitation, whichever is more restrictive, except as provided in par. (c).

(c) The department may on a case-by-case basis use an alternative methodology for calculating daily maximum or monthly average limitations whenever historical flow data or real time data are used to calculate weekly average limitations under s. NR 106.32 (3) (c) 2. and these limitations are determined to be necessary under sub. (1).

(d) If a monthly average limitation is determined necessary and a daily maximum limitation is not already determined necessary under sub. (1), a daily maximum limitation shall be set equal to the daily maximum ammonia WQBEL under s. NR 106.32 (2) or a daily maximum limitation calculated using the following procedure, whichever is more restrictive:

Daily Maximum Limitation = (Monthly Average Limitation x MF)

Where:

MF = Multiplication factor as defined in s. NR 106.07 (3) (e) 4. Table 1, where

CV = The coefficient of variation (CV) as calculated in s. NR 106.07 (5m)

n = the number of samples per month required in the permit

**(4)** PERMIT LIMITATIONS FOR NONCONTINUOUS DISCHARGES. The department shall include ammonia water quality-based effluent permit limitations in permits for seasonal discharges, discharges proportional to stream flow, or other unusual discharge situations that do not meet the definition of a continuous discharge whenever ammonia water quality-based effluent limitations are determined necessary under sub. (1). Ammonia limitations shall be expressed in accordance with s. NR 106.32 (5) unless the department determines on a case-by-case basis that an alternative averaging period is appropriate. The department shall consider all of the following when making a case-by-case determination:

(a) Frequency and duration of discharge.

(b) Total mass of discharge.

(c) Maximum flow rate of discharge.

(d) Whether ammonia is subject to a technology-based limitation or other limitation expressed by mass, concentration, or other appropriate measure in the permit.

**History:** CR 03-050: cr. Register February 2004 No. 578, eff. 3-1-04; CR 15-085: r. and recr. Register August 2016 No. 728, eff. 9-1-16; correction in (3) (a), (b), (d) made under s. 35.17, Stats., Register August 2016 No. 728.

**NR 106.36 Alternative whole effluent toxicity monitoring for certain discharges of ammonia. (1)** In addition to water quality based effluent limitations for ammonia, the department may establish whole effluent toxicity testing requirements and limitations pursuant to ss. NR 106.08 and 106.09.

**(2)** Chronic fathead minnow whole effluent toxicity test samples may be modified to remove ammonia prior to testing when all of the following conditions are met:

(a) The whole effluent toxicity test is being conducted during a period when ammonia effluent limitations based on early life stage absent criteria are in effect.

(b) The permittee has demonstrated compliance with applicable acute and chronic water quality based effluent limitations for ammonia during the testing period.

(c) Total ammonia measured in whole effluent toxicity test effluent samples is less than the applicable chronic water quality based effluent limitation contained in the WPDES permit, but greater than the "ammonia threshold number", determined as follows:

1. Measure the pH of the whole effluent toxicity test effluent sample after the sample has been warmed to the test temperature.

**Note:** Effluent samples should not be aerated to remove supersaturation of dissolved oxygen prior to use in the whole effluent toxicity test. The measured pH value shall be rounded to the nearest one-tenth of a unit.

2. Using the pH value of the sample as determined in subd. 1., determine the value of the ammonia multiplier in Table 1 for the pH range corresponding to the effluent pH.

3. Divide 100 by the appropriate in-stream waste concentration, as a percentage, contained in the WPDES permit; then multiply the resulting value by the ammonia multiplier determined in subd. 2. to obtain the ammonia threshold number.

**(3)** If all of the criteria in sub. (2) have been met, ammonia may be removed from the test sample.

**Table 1 — Ammonia Multiplier**

| Effluent pH (s.u., after warming) | Ammonia Multiplier (mg/l total ammonia) |
|---|---|
| 6.0 - 6.5 | 30 |
| 6.6 - 7.0 | 25 |
| 7.1 - 7.5 | 15 |
| 7.6 - 8.0 | 5 |
| 8.1 - 9.0 | 1 |

**History:** CR 03-050: cr. Register February 2004 No. 578, eff. 3-1-04; CR 15-085: am. Table 1 (title), r. (4) Register August 2016 No. 728, eff. 9-1-16.

**NR 106.37 Schedules of compliance. (1)** The department shall determine and specify a reasonable compliance schedule in the permit if the permittee is unable to meet the ammonia effluent limits determined according to this subchapter at the time of permit reissuance. The department shall establish the term of the compliance schedule on a case-by-case basis consistent with the requirements in s. NR 106.117. When establishing a compliance schedule, the department shall consider factors such as necessary planning, complexity of wastewater treatment issues, scope of construction, equipment delivery time, and construction seasons in establishing a schedule. In no circumstance may the date of compliance with the limits extend more than 5 years after the date of permit reissuance.

**(2)** If the department modifies or reissues the permit to adjust ammonia limitations based on an approval of demonstrations made under either s. NR 106.32 (2) (b) 2. or (3) (a) 4. the department may adjust the compliance schedule if necessary and appropriate.

**(4)** Any point source discharge which was not authorized by a WPDES permit prior to March 1, 2004 may not be provided with a schedule of compliance for achieving ammonia limits, but rather shall meet the limits upon initiation of discharge. A point source discharge previously authorized by a WPDES permit but relocated in the same receiving water body may be allowed a schedule of compliance.

**History:** CR 03-050: cr. Register February 2004 No. 578, eff. 3-1-04; CR 15-085: am. (1), r. and recr. (2), r. (3) Register August 2016 No. 728, eff. 9-1-16.

## Subchapter V — Effluent Limitations for Temperature

**NR 106.50 Purpose.** The purpose of this subchapter is to specify how the department will calculate water quality-based effluent limitations for temperature under s. 283.13 (5), Stats., and to specify how the department will determine when the limitations will be included in Wisconsin pollution discharge elimination system (WPDES) permits. Water quality-based effluent limitations for temperature are necessary to assure attainment and maintenance of surface water quality standards for temperature established in accordance with s. 281.15 (1), Stats., and set forth in subch. II of ch. NR 102.

**History:** CR 07-111: cr. Register September 2010 No. 657, eff. 10-1-10.

**NR 106.51 Applicability.** This subchapter applies to point sources that discharge cooling water, non-contact cooling water, or other wastewater to surface waters of the state if the discharge contains an associated heat load or is elevated in temperature relative to the ambient temperature of the receiving water. The procedures for calculation of effluent limitations identified in this subchapter do not apply to storm water discharges. Effluent limitations determined under this subchapter supersede any temperature limitations listed in s. NR 104.06 (2) (b).

**Note:** Section 283.11 (2) (b), Stats., states that rules concerning storm water discharges may be no more stringent than the requirements under the federal water pollution control act and regulations adopted under that act. Storm water pollution prevention plans may address thermal issues on a case-by-case basis.

**Note:** The department will use enforcement discretion whenever there are exceedances of effluent temperature limitations in a WPDES permit for an electric generating facility during an energy emergency warning or when an energy emergency event has been declared under a Federal Energy Regulatory Commission order (Standard EOP-002, North American Electric Reliability Corporation).

**History:** CR 07-111: cr. Register September 2010 No. 657, eff. 10-1-10.

**NR 106.52 Definitions.** In this subchapter, the following definitions are applicable to terms used:

**(1)** "Ambient temperature" means the typical existing temperature of a surface water outside the direct influence of any point source discharge, which may include daily and seasonal changes.

**(2)** "cfs" means cubic feet per second, usually pertaining to stream or effluent flow.

**(3)** "Cold shock" means exposure of aquatic organisms to a rapid decrease in temperature and a sustained exposure to low temperature that induces abnormal behavioral or physiological performance and may lead to death.

**(4)** "Daily maximum effluent temperature" means the highest temperature measured in a calendar day.

**(5)** "Daily maximum effluent temperature limitation" means the daily maximum effluent temperature limitation established in a permit.

**(6)** "mgd" means million gallons per day, usually pertaining to stream or effluent flow.

**(7)** "New facility" means any new point source facility or new point source discharge that commences operation after October 1, 2010.

**(8)** "Seven-day rolling average effluent flow" means the arithmetic average of the effluent flow measured on a particular day and the 6 preceding days within that calendar month.

**(9)** "Water quality standards" means applicable water quality standards set forth in chs. NR 102 to 104, or any federally promulgated water quality standards applicable to surface waters of the state.

**(10)** "Weekly average effluent temperature" means the arithmetic mean of all daily maximum effluent temperature values recorded in a calendar week, Sunday through Saturday.

**(11)** "Weekly average effluent temperature limitation" means the maximum allowable weekly average temperature determined as the arithmetic mean of all daily maximum effluent temperature values recorded in a calendar week, Sunday through Saturday.

**(12)** "WPDES" or "WPDES permit" means Wisconsin pollutant discharge elimination system permit issued under ch. 283, Stats., but does not include storm water permits issued under s. 283.35, Stats.

**(13)** "WQBEL" means water quality-based effluent limitation.

**History:** CR 07-111: cr. Register September 2010 No. 657, eff. 10-1-10.

**NR 106.53 Parameters used to establish water quality-based effluent limitations for temperature. (1)** RECEIVING WATER FLOW RATE ($Q_s$). The value of receiving water flow rate ($Q_s$) used to determine effluent limitations for discharges to flowing waters shall be as follows:

(a) $Q_s$ shall equal ¼ of the average minimum 7-day flow which occurs once in 10 years (¼ 7-day $Q_{10}$) or, if sufficient information is available to calculate a biologically based receiving water design flow, ¼ of the flow which prevents an excursion from the applicable water quality criteria using a duration of 4 days and a frequency of less than once every 3 years (¼ 4-day, 3-year biological flow).

(b) $Q_s$ may be reduced from those values calculated in par. (a) wherever natural receiving water flow is significantly altered by flow regulation or other types of water diversion structures.

(c) The discharger shall be allowed to demonstrate, through appropriate and reasonable methods that an adequate passageway for movement of aquatic life exists in the cross-section of the receiving water or that dilution is accomplished rapidly such that the extent of the mixing zone is minimized. In complex situations, the department may require that the demonstration under this paragraph include water quality modeling or field dispersion studies.

(d) Based upon the results of a demonstration submitted under par. (c), $Q_s$ may be modified from that specified in par. (a) or (b). A modified $Q_s$ shall be determined on a case-by-case basis and shall be approved in writing by the department. $Q_s$ may not exceed the larger of the 7-day $Q_{10}$ or the 4-day, 3-year biologically based design flow, except when a permit allows the use of real-time data for the determination of water quality based effluent limitations for temperature, as provided in s. NR 106.54 (4).

(e) The value of $Q_s$ may not exceed that of par. (a) if the department determines that the discharge has a potential to jeopardize the continued existence of any endangered or threatened species listed under ch. NR 27 or section 7 of the federal Endangered Species Act, 16 USC 1536.

**(2)** EFFLUENT FLOW RATE ($Q_e$). The value of effluent flow rate ($Q_e$) used to determine effluent temperature limitations shall be as follows:

(a) *Flow ratios.* For purposes of determining a flow ratio pursuant to s. NR 106.55 (6) (a), $Q_e$ shall equal:

1. For discharges subject to ch. NR 210 and which discharge for 24 hours per day on a year-round basis, $Q_e$ shall equal the maximum effluent flow, expressed as a daily average, that is anticipated to occur for 12 continuous months during the design life of the treatment facility unless it is demonstrated to the department that such a design flow rate is not representative of projected flows at the facility.

2. For all other dischargers not subject to ch. NR 210, $Q_e$ shall equal the maximum effluent flow, expressed as a daily average, that has occurred for 12 continuous months and represents normal operations.

3. For seasonal discharges, discharges proportional to stream flow, or other unusual discharge, $Q_e$ shall be determined on a case-by-case basis.

(b) *Acute temperature limitation.* For purposes of determining acute temperature limitations pursuant to s. NR 106.55 (6) (b), $Q_{ea}$ shall be the highest daily maximum effluent flow rate, expressed as mgd, which has occurred for each calendar month of the year and represents normal operating conditions.

(c) *Sub-lethal temperature limitation.* For purposes of determining sub-lethal temperature limitations pursuant to s. NR 106.55 (6) (a), ($Q_{esl}$) shall be the highest 7-day rolling average effluent flow rate within a calendar month, expressed as mgd, which has occurred for each calendar month of the year and represents normal operating conditions.

(d) *Non-typical effluent flows.* For purposes of determining effluent temperature limitations pursuant to s. NR 106.55 (6) (a) and (7), $Q_{ea}$ and $Q_{esl}$ may be determined on a case-by-case basis for seasonal discharges, discharges proportional to stream flow, or other unusual discharge situations.

**History:** CR 07-111: cr. Register September 2010 No. 657, eff. 10-1-10.

**NR 106.54 Representative effluent temperature data. (1)** The representative daily maximum effluent temperature is the highest effluent temperature known or expected to occur on any day under normal operating conditions at the time of permit issuance. Representative daily maximum effluent temperature shall be measured at a frequency of not less than once per week whenever a discharge occurs.

**(2)** The representative weekly average effluent temperature is the highest weekly average effluent temperature known or expected to occur under normal operating conditions at the time of permit issuance.

**(3)** The department may require a permittee to collect additional data if the department determines that the requirements of subs. (1) and (2) do not provide adequate data to document the operational variability of a discharge.

**(4)** A permittee may request, at the time of application for a WPDES permit, calculation of effluent temperature limitations to be included in a permit based on real-time data. Any permittee that makes such a request shall provide effluent flow, effluent temperature, receiving water flow, and receiving water temperature at a frequency no less than one result per hour that is representative of normal operating conditions, including variability.

**History:** CR 07-111: cr. Register September 2010 No. 657, eff. 10-1-10.

**NR 106.55 Determination of water quality-based effluent limitations for temperature in WPDES permits. (1)** GENERAL. The department shall determine water quality-based effluent limitations for temperature to attain and maintain water quality standards and criteria specified in or determined according to procedures in subch. II of ch. NR 102.

**(2)** LIMITATIONS FOR WATERS DESIGNATED AS LIMITED AQUATIC LIFE. The daily maximum effluent temperature limitation shall be 86°F for discharges to surface waters classified as limited aquatic life according to s. NR 104.02 (3) (b) 1. and as defined in s. NR 104.02 (1), except for those classified as wastewater effluent channels and for wetlands regulated under ch. NR 103.

**(3)** LIMITATIONS FOR WATERS DESIGNATED AS WASTEWATER EFFLUENT CHANNELS. The daily maximum effluent temperature limitation shall be 120°F for discharges to surface waters classified as limited aquatic life wastewater effluent channels according to s. NR 104.02 (3) (b) 1. and as defined in s. NR 104.02 (1) (d).

**(4)** LIMITATIONS FOR WETLANDS. Effluent temperature limitations shall be established for wetlands on a case-by-case basis to meet the water quality standards provided in ch. NR 103, but in no case shall the effluent temperature limitation be greater than 120°F.

**(5)** LIMITATIONS FOR DISCHARGES TO STORM SEWERS. (a) *General.* A permittee may request, at time of permit application, an effluent limitation greater than the effluent temperature limitations required under subs. (2) to (4), (6) or (7) if the discharge is to a storm sewer or other storm water conveyance channel. The permittee may request that the higher effluent limitation be greater than 120°F if the permittee is able to demonstrate to the satisfaction of the department that the heated effluent is not discharged in a manner that will cause a potential for scalding of humans. An effluent temperature limitation established under this subsection shall be determined according to the following equation:

$$T_{ss} = T_{dir} + (HLV \times (L/100))$$

Where:

$T_{ss}$ = Effluent temperature limitation for discharge to a storm sewer in degrees Fahrenheit

$T_{dir}$ = Effluent temperature limitation determined under sub. (2), (3), (4), (6) or (7) in degrees Fahrenheit

HLV = Heat loss value assumed to be 0.25 unless an alternative value is determined to be representative of site-specific conditions

L = Length (in feet) of the storm sewer or other storm water conveyance channel between the effluent discharge location and the point at which the storm sewer or storm water conveyance channel discharges to a surface water of the state

(b) *Alternative heat loss value.* An alternative heat loss value (HLV) may be used in the equation in par. (a). The alternative value shall be representative of seasonal influences on heat loss and be based on a comparison of effluent temperature at the location of discharge to the storm sewer or storm water conveyance channel and the point at which the storm sewer or storm water conveyance channel discharges to a surface water of the state.

(c) *Site-specific information.* The department may use available site-specific information to determine an alternative heat loss value or other data demonstrating the amount of heat loss in a storm sewer to establish an effluent temperature limitation for discharges to a storm sewer.

**(6)** LIMITATIONS FOR RECEIVING WATERS WITH UNIDIRECTIONAL FLOW NOT DESIGNATED AS LIMITED AQUATIC LIFE. Except as provided in subs. (2) to (5), the department shall establish water quality-based effluent limitations to ensure that effluent is not discharged at elevated temperatures that may adversely affect humans or aquatic life at or near the point of discharge for discharges to surface waters with unidirectional flow.

(a) *Flow ratio categories.* Effluent temperature limitations shall be established based upon the designated use of the water and the ratio of streamflow to effluent flow as determined in Table 1. Effluent flow shall be equal to the value specified in s. NR 106.53 (2) (a).

**Table 1 — Flow Ratio Categories**

| Warm Water and Limited Forage Fish Designated Waters | Cold Water Designated Waters | Effluent Temperature Limitation |
|---|---|---|
| Qs:Qe ≥ 20:1 | Qs:Qe ≥ 30:1 | 120°F |
| 20:1 > Qs:Qe > 2:1 | 30:1 > Qs:Qe > 2.5:1 | 120°F or the sub-lethal WQBEL as calculated in par. (b), whichever is lower |
| Qs:Qe ≤ 2:1 | Qs:Qe ≤ 2.5:1 | Sub-lethal and acute WQBELs as calculated in par. (b) |

(b) *Calculation of limitations.* The methods described in this paragraph apply to the determination of both acute and sub-lethal effluent temperature limitations. Water quality-based effluent temperature limitations to meet the requirements of this subsection shall be determined using the following procedures:

$$WQBEL = [((WQC - T_a)(Q_s + (1 - f)Q_e)) / Q_e] + T_a$$

Where:

WQBEL = Water quality-based effluent temperature limitation (in degrees Fahrenheit)

WQC = Water quality criteria (in degrees Fahrenheit) as defined in ss. NR 102.25 and 102.27

$T_a$ = Ambient temperature (in degrees Fahrenheit) as determined in ss. NR 102.25 and 102.26

$Q_s$ = Receiving water flow rate equal to ¼ 7-$Q_{10}$ or ¼ 4-day, 3-year biological flow as specified in s. NR 106.53 (1) (a) unless an alternative receiving water flow rate has been determined in accordance with s. NR 106.53 (1) (b) to (e)

f = Fraction of the effluent flow that is withdrawn from the receiving water, where "*f*" ranges from 0 to 1 and is unitless

$Q_e$ = Effluent flow rate in mgd as specified in s. NR 106.53 (2) (b) to (d)

(c) *Limitations for mussel control.* Short-term excursions from the effluent temperature limitation determined in this subsection may occur for the purposes of zebra or other mussel control if approved by the department and authorized in a permit on a case-by-case basis.

(d) *More stringent limitations.* The department shall establish more stringent effluent temperature limitations than those determined under the provisions of this subsection whenever it is demonstrated that the temperature of the discharge may cause or contribute to nonattainment of aquatic life uses and that more stringent limitations are necessary to assure the protection and propagation of a balanced indigenous population of shellfish, fish and wildlife in or on the body of water into which the discharge is made. Effluent temperature limitations under this paragraph shall be established whenever one or more of the mixing zone requirements in s. NR 102.05 (3), as they apply to temperature, are not maintained.

**(7)** LIMITATIONS FOR INLAND LAKES, IMPOUNDMENTS AND GREAT LAKES WATERS. The department shall establish water quality-based effluent limitations to ensure that the effluent is not discharged at elevated temperatures that may adversely affect humans or aquatic life at or near the point of discharge for discharges to surface waters that are inland lakes, impoundments, or Great Lakes waters that do not exhibit unidirectional flow.

(a) *Limitations for mussel control.* Short-term excursions from the effluent temperature limitation determined in this subsection may occur for the purposes of zebra or other mussel control if approved by the department and authorized in a permit on a case-by-case basis.

(b) *Calculation of limitations.* The methods described in this paragraph apply to the determination of both acute and sub-lethal effluent temperature limitations. Water quality-based effluent temperature limitations to meet the requirements of this subsection shall be determined using the following procedures:

$$WQBEL = [(WQC - T_a)/(e^{-a})] + T_a$$

Where:

WQBEL = Water quality-based effluent temperature limitation (in degrees Fahrenheit)

WQC = Water quality criteria (in degrees Fahrenheit) as defined in ss. NR 102.25 to 102.27

$T_a$ = Ambient temperature (in degrees Fahrenheit) as determined in ss. NR 102.25 to 102.27

$e^{-a}$ = An empirical factor; "e" is the base of the natural logarithm and the exponent "*a*" is calculated as follows:

$$a = [(A)(54.7 + B(150))] / [(8{,}345{,}000)(Q_e)]$$

Where:

A = Area of mixing zone in square feet, as follows:

| Maximum Area Allowed (square feet) | | Water Body |
|---|---|---|
| 31,416 | = | inland lake or impoundment off-shore discharge |
| 15,708 | = | inland lake or impoundment shore discharge |
| 15,708 | = | Great Lakes harbor discharge |
| 3,141,593 | = | Great Lakes off-shore discharge |
| 3,125,000 | = | Great Lakes shore discharge |

The maximum area of the mixing zone is subject to all applicable portions of s. NR 102.05 (3)

B = A coefficient which is a function of $T_a$ as follows:

| $T_a$ | B |
|---|---|
| ≤ 59.9 | 0.405 |
| 60-69.9 | 0.555 |
| 70-79.9 | 0.667 |
| ≥ 80 | 0.990 |

$Q_e$ = Effluent flow rate in mgd as specified in s. NR 106.53 (2)

**(8)** LIMITATIONS FOR DISCHARGES WITH FLUCTUATING OR VARIABLE EFFLUENT FLOW RATES. A permittee may request flow-related effluent temperature limitations for discharge flows that fluctuate or vary on a frequent basis. Flow-related effluent temperature limitations shall be determined as follows:

(a) At the time of permit application, the permittee shall submit representative minimum and maximum effluent flow data for the interval of variability for which effluent flow-related limitations are requested.

**Note:** For example, if the interval of variability is for a particular season or time of the year, then maximum and minimum effluent flow data submitted should be for that season.

(b) Effluent temperature limitations shall be determined following the procedures of subs. (6) or (7), as appropriate, using both the minimum and maximum effluent flow rates submitted in par. (a).

(c) Effluent temperature limitations determined in accordance with par. (b) shall be expressed in a permit as a function of effluent flow.

(d) Permits that contain flow-related effluent temperature limitations shall require daily monitoring of effluent temperature during times of discharge.

**(9)** LIMITATIONS TO PROTECT DOWNSTREAM WATERS. The department may calculate more stringent effluent temperature limitations than those determined under this section whenever more stringent limitations are necessary to attain or maintain water quality standards in downstream or other nearby waters that may be affected by the heated discharge.

**(10)** LIMITATIONS BASED ON SITE-SPECIFIC MIXING ZONE ANALYSIS. The department may calculate effluent temperature limitations that differ from those determined under this section. A request by the permittee for a site specific mixing zone shall include all of the following:

(a) A mixing zone analysis that details the full extent and condition of the mixing zone.

(b) A demonstration that such effluent temperature limitations meet all mixing zone provisions of s. NR 102.05 (3).

(c) A demonstration that such effluent temperature limitations shall attain all aquatic life uses in the body of water into which the discharge is made.

(d) A demonstration that such effluent temperature limitations shall provide a level of protection equivalent to or better than that provided by the temperature water quality criteria in ch. NR 102.

**(11)** LIMITATIONS BASED ON INSTALLATION OF DIFFUSERS AND OTHER MECHANICAL DEVICES. The department may calculate effluent temperature limitations that differ from those determined under this section whenever the permittee installs diffusers or other mechanical devices used to ensure rapid mixing of effluent and significantly reduces or eliminates the size of the mixing zone. It shall be demonstrated that the resulting mixing zone meets all mixing zone provisions of s. NR 102.05 (3), and that the resulting mixing zone will attain all aquatic life uses in the body of water into which the discharge is made and provide a level of protection equivalent to or better than that provided by the temperature water quality criteria in ch. NR 102.

**(12)** MORE STRINGENT LIMITATIONS. The department shall establish more stringent effluent temperature limitations than those determined under s. NR 106.55 (2) to (11) whenever the department determines that the discharge may cause or contribute to non-attainment of s. NR 102.04 (4) (e).

**(13)** LIMITATIONS BASED ON WATER QUALITY MODELS. The department may calculate water quality-based effluent limitations that differ from those specified in this section using water quality modeling submitted pursuant to s. NR 106.58.

**History:** CR 07-111: cr. Register September 2010 No. 657, eff. 10-1-10; CR 15-085: am. Table 1 (title) Register August 2016 No. 728, eff. 9-1-16.

## NR 106.56 Establishment of water quality-based effluent limitations for temperature in WPDES permits.

**(1)** GENERAL. The department shall use the methods in this section to determine the need to establish water quality-based effluent temperature limitations in a permit.

**(2)** REASONABLE POTENTIAL TO EXCEED AN ACUTE EFFLUENT LIMITATION. An acute water quality-based effluent limitation for temperature shall be established in a WPDES permit for each month in which the representative daily maximum effluent temperature for that month exceeds the acute water quality-based effluent limitation determined in s. NR 106.55. The representative daily maximum effluent temperature used in this subsection shall be the greater of the following:

(a) The highest recorded representative daily maximum effluent temperature as measured or determined according to s. NR 106.54 (1).

(b) The projected 99$^{th}$ percentile of all representative daily maximum effluent temperatures as measured or determined according to s. NR 106.54 (1).

**(3)** REASONABLE POTENTIAL TO EXCEED A SUB-LETHAL EFFLUENT LIMITATION. A sub-lethal water quality-based effluent limitation for temperature shall be established in a WPDES permit for each month in which the representative weekly average effluent temperature for that month exceeds the sub-lethal water quality-based effluent limitation calculated in s. NR 106.55. The representative weekly average effluent temperature used in this subsection shall be the greater of the following:

(a) The highest weekly average effluent temperature for the month as measured or determined according to s. NR 106.54 (2).

(b) The projected 99$^{th}$ percentile of all representative weekly average effluent temperatures for the month as measured or determined according to s. NR 106.54 (2).

**(4)** REASONABLE POTENTIAL TO EXCEED A LIMITED AQUATIC LIFE EFFLUENT LIMITATION. A daily maximum effluent temperature limitation of 86°F shall be established in a WPDES permit for each month in which the representative daily maximum efflu-

ent temperature exceeds 86°F for discharges to limited aquatic life waters not classified as a wastewater effluent channel according to s. NR 104.02 (1), storm sewers or as a wetland regulated under ch. NR 103.

**(5)** REASONABLE POTENTIAL TO EXCEED A WASTEWATER EFFLUENT CHANNEL EFFLUENT LIMITATION. A daily maximum effluent temperature limitation of 120°F shall be established in a WPDES permit for each month in which the representative daily maximum effluent temperature exceeds 120°F for discharges to a wastewater effluent channel, as classified in s. NR 104.02 (1).

**(6)** REASONABLE POTENTIAL TO EXCEED A STORM SEWER EFFLUENT LIMITATION. A daily maximum effluent temperature limitation greater than 120°F shall be established in a WPDES permit for a discharge to a storm sewer for each month in which the representative daily maximum effluent temperature exceeds the limitation determined according to the procedure in s. NR 106.55 (5).

**(7)** REASONABLE POTENTIAL TO EXCEED A WETLAND EFFLUENT LIMITATION. A daily maximum or weekly average effluent temperature limitation shall be established in a WPDES permit for each month in which the representative daily maximum or weekly average effluent temperature, respectively, exceeds the limits for a discharge to a wetland determined according to the provisions in s. NR 106.55 (4).

**(8)** REASONABLE POTENTIAL TO EXCEED LIMITATIONS FOR THE PROTECTION OF PUBLIC HEALTH AND WELFARE. A daily maximum effluent temperature limitation of 120°F shall be established in a WPDES permit for each month in which the representative daily maximum effluent temperature exceeds 120°F, unless the permittee demonstrates to the satisfaction of the department that the heated effluent is not discharged in a manner that will cause a potential for scalding of humans.

**(9)** LIMITATIONS TO PROTECT DOWNSTREAM WATERS. Whenever the department determines that more stringent effluent temperature limitations than those established according to subs. (1) through (6) are necessary to attain or maintain water quality standards in downstream or other adjacent waters and the representative daily maximum or weekly average effluent temperatures exceed the limitations, then more stringent effluent temperature limitations shall be established in a WPDES permit.

**(10)** LIMITATIONS TO PROTECT FOR COLD SHOCK. The department shall determine on a case-by-case basis if any additional conditions are necessary in a WPDES permit to protect against cold shock and in accordance with the standard specified in s. NR 102.28. Provisions under this subsection shall be in addition to the water quality-based effluent temperature limitations determined under this section.

**(11)** LIMITATIONS TO PROTECT FOR RATE OF TEMPERATURE CHANGE. The department shall determine on a case-by-case basis if any conditions are necessary in a WPDES permit to protect against detrimental health or reproductive effects to fish and aquatic life caused by excessive rates of temperature change.

**(12)** REPRESENTATIVE DATA UNAVAILABLE. Whenever after October 1, 2010, the department issues or reissues a permit to a discharger for which representative effluent temperature data as described in s. NR 106.54 is not available, the following requirements shall be included in the issued or reissued permit:

(a) Monitoring to obtain representative effluent temperature as described in s. NR 106.54. Monitoring shall be required for a period of not less than one year. When effluent temperatures in any month are highly variable, monitoring for 2 years may be required. If the facility only operates during certain portions of the year, representative effluent temperature shall be measured during the period of operation.

(b) Water quality-based effluent temperature limitations determined under applicable methods described in s. NR 106.55 and as determined necessary under any applicable provision of this section. Compliance with the limitations shall be attained as soon as reasonably possible, but no later than the expiration date of the permit. The department may modify the permit at any time during the permit term and establish a compliance date to attain effluent temperature limitations sooner than the expiration date of the permit.

(c) If, after the data collection required under par. (a), it is determined that an effluent temperature limitation is not necessary under any applicable provision of this section, the water quality-based effluent temperature limitations in the permit may not be effective. A condition shall be included in the permit that invalidates any effluent temperature limitations and the compliance schedule in the permit. Continued monitoring of effluent temperature may be required.

**(13)** MONITORING. The department shall establish on a case-by-case basis the monitoring and reporting frequency for temperature in a WPDES permit.

**(14)** LIMITATIONS IN PERMITS. Effluent temperature limitations of 86°F, 120°F or greater than 120°F determined necessary under subs. (4) to (7) shall be expressed in permits as daily maximum effluent temperature limitations.

(a) Acute effluent temperature limitations determined necessary under this section shall be expressed in permits as daily maximum effluent temperature limitations.

(b) Sub-lethal effluent temperature limitations determined necessary under this section shall be expressed in permits as weekly average effluent temperature limitations.

(c) In all cases, monitoring data collected for purposes of reporting and determining compliance shall be representative effluent temperature data as described in s. NR 106.54.

**History:** CR 07-111: cr. Register September 2010 No. 657, eff. 10-1-10.

**NR 106.57 Effluent limitations for multiple thermal discharges.** Whenever the department determines that more than one thermal discharge may be adversely affecting the water quality of the same receiving water, the provisions of both this subchapter and s. NR 106.11 shall be used to calculate the combined allowable heat load from the discharges necessary to meet the water quality criteria for temperature as specified in ch. NR 102. The resultant allowable thermal load shall be divided among the various discharges using an allocation method based on site-specific considerations. Whenever the department makes a determination under this subsection, the department shall specify the reasonable potential basis for any effluent temperature limitation and shall notify all permittees who may be affecting the water quality of the same receiving water of the determination and any limitations developed under this section. Any modifications to WPDES permits to account for multiple discharges shall include an opportunity for public comment pursuant to ch. 283, Stats.

**History:** CR 07-111: cr. Register September 2010 No. 657, eff. 10-1-10.

**NR 106.58 Effluent limitations based on water quality models. (1)** At the time of permit application, a permittee may submit the results of scientifically defensible technical approaches, such as calibrated models and verified mathematical water quality models developed or adapted for a particular water body, simplified modeling approaches as outlined in "WATER QUALITY ASSESSMENT" (EPA-600/6-82-004), or other dynamic methods to be utilized in developing water quality-based effluent limitations.

**(2)** Data used to support the analyses conducted under sub. (1) shall be representative of the long-term characteristics of the receiving water and shall be collected in a manner consistent with requirements of ch. NR 219.

**(3)** The department shall review the results of the analyses conducted under sub. (1) on a case-by-case basis and shall determine the water quality-based effluent limitations necessary to ensure that the applicable water quality standards specified in ch. NR 102 are maintained.

**(4)** Effluent limitations approved under this section are in lieu of the procedures in s. NR 106.55 (5), (6), and (7), and are not modifications to the water quality criteria specified in ch. NR 102.

**History:** CR 07-111: cr. Register September 2010 No. 657, eff. 10-1-10.

**NR 106.59 Effluent limitations for temperature for permits issued to publicly or privately owned domestic sewage treatment works. (1)** APPLICABILITY. This section applies to specific outfalls from permittees with discharges subject to ch. NR 210.

**(2)** DEFINITIONS. In this section, the following definitions are applicable to terms used:

(a) "Dissipative cooling" means the cooling effects associated with heat loss to the ambient water, the atmosphere and the surrounding environment.

(b) "Estimated daily maximum effluent temperature" means the highest temperature expected in a calendar day based on an average of effluent temperatures available. Available data may be from at least two other POTWs within a 100 mile radius that utilize similar wastewater treatment technology and have a similar ratio of domestic to industrial waste stream composition, or representative data of the POTW.

(c) "Existing POTW outfall" means any discharge structure that has been included in a WPDES permit issued prior to October 1, 2010, that was used to convey wastewater effluent to a surface water and has not been re-located.

(d) "New POTW discharge" means any point source subject to ch. NR 210 that has not received a WPDES permit from the department prior to October 1, 2010 or a permitted outfall re-located to a new receiving water after October 1, 2010.

(e) "POTW" means all publicly operated treatment works and privately owned domestic sewage treatment works subject to ch. NR 210.

(f) "Re-located POTW outfall" means any point source outfall structure associated with a previously issued WPDES permit that is moved or constructed after October 1, 2010 to convey wastewater to the same receiving water where fish and other aquatic life are materially exposed to a modified thermal pollutant load.

**Note:** The department considers an outfall to be re-located when an assemblage of fish and other aquatic life are subjected to a heat load that they were not exposed to previously. In determining whether a change in location is a re-located outfall, the department shall consider the distance of the changed location, the potential for the heat load to adversely impact resident organisms, and whether or not the applicable provisions of s. NR 102.05 (3) are satisfied.

**(3)** ACUTE LIMITATIONS FOR EXISTING POTW OUTFALLS. (a) The department shall establish acute effluent temperature limitations for an existing POTW outfall to surface waters classified as limited aquatic life whenever the representative daily maximum effluent temperature is greater than the applicable water quality criterion specified in s. NR 102.245.

(b) The department shall establish acute effluent temperature limitations for an existing POTW outfall to surface waters classified as cold water, warm water sport fish, warm water forage fish, or limited forage fish whenever the representative daily maximum effluent temperature is greater than the applicable water quality criterion specified in s. NR 102.25 or determined under s. NR 102.27. The applicable acute water quality criterion shall be based on representative ambient temperature of the receiving stream determined as follows:

1. Except as provided in subd. 2., the representative ambient temperature shall be equal to the ambient temperatures in s. NR 102.25 or approved under s. NR 102.26.

2. Where the $Q_e$ of a permitted POTW is significantly greater than the $Q_s$ of the receiving stream immediately upstream of the POTW outfall, the representative ambient temperature may be equal to the daily maximum effluent temperature.

3. The provisions of subd. 2. are not applicable to a permitted POTW with a discharge outfall that shares a mixing zone with an upstream discharger.

**(4)** SUB-LETHAL LIMITATIONS FOR EXISTING POTW OUTFALLS. Upon request by the POTW at the time of permit application, the department may account for dissipative cooling of a POTW effluent in determining the need for sub-lethal effluent limitations. The department shall establish sub-lethal effluent limitations for an existing POTW outfall whenever the department determines that the effluent has a reasonable potential to cause or contribute to an exceedance of the applicable sub-lethal criterion outside of a small area of mixing and cooling. In determining the need for sub-lethal effluent limitations, the department shall consider the cooling of the effluent through dissipation of heat to the environment to the extent that a POTW provides information to support such determination as set forth below.

(a) The POTW shall provide any of the following information to allow the department to determine whether or not sub-lethal criteria are exceeded outside a small area of mixing and cooling.

1. A written description of the physical characteristics of the receiving water or outfall that encourage rapid dilution, diffusion, dispersion, or dissipation of heat.

2. A written description of the presence or absence of other thermal loads to the receiving stream.

3. The minimum and maximum effluent temperature for each calendar week for each permitted outfall over the past two years.

(b) In addition to the information submitted in par. (a), the POTW shall submit existing information it has collected, generated, reviewed, or received regarding the following site-specific conditions:

1. Information regarding the biological quality of the animal and plant community of the receiving water including, but not limited to, species composition, richness, diversity, density, distribution, age structure, spawning incidence, and presence of any state or federally listed threatened or endangered species.

2. Data concerning the physical characteristics of the receiving water or permitted outfalls that encourage rapid dilution, diffusion, dispersion, and/or dissipation of heat.

3. The minimum and maximum temperature of the receiving water upstream of all permitted outfalls for each calendar month over the past two years.

(c) In evaluating the potential for exceedance of sub-lethal criteria outside a small area of mixing and cooling, the department shall consider site-specific information including, but not limited to:

1. The physical characteristics of the receiving water including those related to mixing, turbulence, diffusion, dilution, dispersion, and heat dissipation.

2. The occurrence of other thermal mixing zones and their influence on the dissipative potential of the receiving water.

3. The variability of effluent temperature from the POTW.

4. The expected difference between the ambient receiving water temperature and the representative effluent temperature.

5. The attainment status of the receiving water biological community in response to the discharge of heated effluent.\

6. The potential impacts to state or federally listed threatened or endangered species.

**Note:** The absence of information pertaining to subds. 1. to 6., shall not preclude a determination that a sub-lethal effluent limitation is not necessary.

(d) In addition to the requirements in pars. (a) and (b), the department reserves the right to request additional information from the POTW to support the request for consideration of dissipative cooling.

(e) If the department determines that a sub-lethal effluent limitation for temperature is not necessary, a specific request for comment on the department's determination shall be included in the public notice for the proposed permit.

**(5)** ACUTE LIMITATIONS FOR NEW POTW DISCHARGES OR RE-LOCATED POTW OUTFALLS. (a) The department shall establish acute effluent temperature limitations for a new POTW discharge or re-located POTW outfall to a surface water classified as limited aquatic life whenever the estimated daily maximum effluent temperature is greater than the applicable water quality criterion specified in s. NR 102.245.

(b) The department shall establish acute effluent temperature limitations for a new POTW discharge or re-located POTW outfall to a surface water classified as cold water, warm water sport fish, warm water forage fish, or limited forage fish whenever the estimated daily maximum effluent temperature is greater than the applicable water quality criterion specified in s. NR 102.25 or determined under s. NR 102.27. The applicable acute water quality criterion shall be based on the ambient temperatures in s. NR 102.25 or approved under s. NR 102.26.

**(6)** SUB-LETHAL LIMITATIONS FOR NEW POTW DISCHARGES OR RE-LOCATED POTW OUTFALLS. Upon request by the POTW at the time of permit application, the department may account for dissipative cooling of a POTW effluent in determining the need for sub-lethal effluent limitations. The department shall establish sub-lethal effluent limitations for a new POTW discharge or re-located POTW outfall whenever it is determined that the effluent has a reasonable potential to cause or contribute to an exceedance of the applicable sub-lethal criterion outside of a small area of mixing and cooling. In determining the need for sub-lethal effluent limitations, the department shall consider the cooling of the effluent through dissipation of heat to the environment to the extent that a POTW provides information to support such determination as set forth below:

(a) The POTW shall provide any of the following information to allow the department to determine whether or not the sub-lethal criteria are exceeded outside of a small area of mixing and cooling:

1. A written description of the physical characteristics of the receiving water or outfall that encourage rapid dilution, diffusion, dispersion, and dissipation of heat.

2. A written description of the presence or absence of other thermal loads to the receiving water.

3. The minimum and maximum known effluent temperature for each calendar week for each previously permitted outfall over the past two years.

4. The maximum expected effluent temperature for each calendar month for each new outfall.

(b) In addition to the information submitted in par. (a), the POTW shall submit existing information it has collected, generated, reviewed, or received regarding the following site-specific conditions:

1. Information regarding the biological quality of the animal and plant community of the receiving water including, but not limited to, species composition, richness, diversity, density, distribution, age structure, spawning incidence, and presence of any state or federally listed threatened or endangered species.

2. Data concerning the physical characteristics of the receiving water or permitted or proposed outfalls that encourage rapid dilution, diffusion, dispersion, or dissipation of heat.

3. The minimum and maximum temperatures of the receiving water upstream of all permitted or proposed outfalls for each calendar month over the past two years.

(c) In evaluating the potential for exceedance of sub-lethal criteria outside a small area of mixing and cooling, the department shall consider site-specific information including, but not limited to:

1. The physical characteristics of the receiving water including those related to mixing, turbulence, diffusion, dilution, dispersion, and heat dissipation.

2. The occurrence of other thermal mixing zones and their influence on the dissipative potential of the receiving water.

3. The known or expected variability of effluent temperatures from the POTW.

4. The known or expected difference between the ambient receiving water temperature and the representative effluent temperature.

5. The attainment status of the receiving water biological community in response to the discharge of heated effluent.

6. The potential impacts to state or federally listed threatened or endangered species.

**Note:** The absence of information pertaining to subpars. 1-6 shall not preclude a determination that a sub-lethal effluent limitation is not necessary.

(d) In addition to the requirements of pars. (a) and (b), the department reserves the right to request additional information from the POTW to support the request for consideration of dissipative cooling.

(e) If the department determines that a sub-lethal effluent limitation is not necessary for a new POTW discharge or a re-located POTW outfall, a specific request for comment on the department's determination shall be included in the public notice for the proposed permit.

**(7)** MONITORING. WPDES permits issued in accordance with this section that include effluent temperature limitations shall include a requirement to monitor effluent temperatures on a weekly basis.

**(8)** PERMIT REISSUANCE. (a) A POTW seeking reissuance of a permit in which the department did not include sub-lethal effluent limitations due to recognition of dissipative cooling may request continued consideration of dissipative cooling provided all of the following conditions are met:

1. The request is received at the time of application for the permit reissuance.

2. The POTW certifies, in writing, that there has been no substantive change in the operation of or loadings to the POTW relative to the information provided in the previous permit application under sub. (4) or (6).

3. The POTW submits any new information generated during the current permit term and certifies, in writing, that the new information is consistent with information submitted with the previous permit application under sub. (4) or (6).

(b) If the department determines that the information provided in par. (a) is consistent with the information submitted with a previous permit application and that sub-lethal effluent limitations for temperature are not necessary, a specific request for comment on the department's determination shall be included in the public notice for the proposed permit.

(c) If the department determines that the information provided in par. (a) is inconsistent with the information submitted with a previous permit application, the department shall establish sub-lethal effluent limitations when there is a reasonable potential for the discharge to cause or contribute to an exceedance of an applicable sub-lethal water quality criterion outside a small area of mixing and cooling.

**History:** CR 07-111: cr. Register September 2010 No. 657, eff. 10-1-10.

**NR 106.60 Effluent limitations for temperature for discharges from new facilities.** Except as provided in subch. VI, new facilities issued a WPDES permit after October 1, 2010, shall be designed to meet applicable water quality-based effluent temperature limitations, as determined in this subchapter, on the effective date of the WPDES permit. The department may require a permittee to provide diffusers or other such devices to ensure rapid mixing of effluent into the water body receiving the discharge or may require a mixing zone analysis to demonstrate that the proposed mixing zone of the new POTW discharge will meet the mixing zone provisions of s. NR 102.05 (3).

**History:** CR 07-111: cr. Register September 2010 No. 657, eff. 10-1-10.

**NR 106.61 General permit. (1)** A general permit issued by the department that contains effluent temperature limitations and monitoring requirements for discharges of non-contact cooling water, non-contact condensate, boiler water blowdown, and boiler bleedoff directly to surface water, to a storm sewer, or for discharges to the land surface, or to groundwater shall include all of the following conditions:

(a) Procedures to determine effluent temperature limitations for individual discharges covered by the general permit in accordance with the provisions of this subchapter. For each facility covered by the general permit, the department shall establish effluent temperature limitations for the facility directly in the general permit or in the general permit discharge authorization letter to the permittee.

(b) Discharges to wetlands shall be allowed if, when granting coverage, the department determines that the requirements of ch. NR 103 are met.

(c) Discharges shall not be allowed if the receiving waterbody is an outstanding resource water or an exceptional resource water, as specified in ss. NR 102.10 and 102.11, respectively.

(d) Discharges to the land surface, to the groundwater or to storm water ponds shall have a daily maximum effluent temperature limitation of 120°F, provided that the discharge does not have a reasonable potential to exceed temperature water quality standards in waters of the state downstream of the discharge location.

(e) Discharges shall not contain wastewater from industrial or commercial processes, other than those authorized in sub. (1).

(f) Discharge does not contain a water treatment additive including biocides. However, the department may approve in writing the use of water treatment additives that are not biocides.

(g) Discharge does not cause a safety hazard due to unsafe ice conditions in winter.

(h) The permittee shall be required to collect representative daily maximum effluent temperatures not less than once per month. Unless specified otherwise by the department when coverage is granted under the general permit, the permittee shall not be required to submit effluent temperature data collected under the monitoring provisions of the general permit issued under this section. Any effluent temperature data collected shall be retained by the permittee for the duration of the permit or 3 years after this information is collected, whichever is longer and shall be provided to the department upon request.

**(2)** A general permit issued under this section may include any of the following conditions:

(a) Coverage under the general permit for discharges containing water treatment additives, except for biocides, provided all other requirements of this chapter are met.

(b) Provisions that account for the heat loss that occurs in a discharge to a storm sewer or other storm water conveyance channel assuming the heat loss occurs at a rate of 0.25 degree F per 100 feet of storm sewer or channel length. The effluent temperature limitations determined under this paragraph shall be established when the department grants coverage under this general permit.

(c) Provisions to allow the department to establish more stringent effluent temperature limitations as necessary to attain or maintain water quality standards in downstream or other adjacent waters. The effluent temperature limitations determined under this paragraph shall be established when the department grants coverage under the general permit.

**(3)** A permittee granted coverage under the general permit authorized under this section shall be required to verify conformance with the conditions in sub. (1) whenever the permit coverage is renewed.

**History:** CR 07-111: cr. Register September 2010 No. 657, eff. 10-1-10.

**NR 106.62 Compliance schedules.** The permittee shall attain compliance with the effluent limitations as soon as reasonably possible, but no later than the expiration date of the permit. When a permit is issued or reissued with effluent temperature limitations established using the procedures in this subchapter and representative effluent temperature data are available at the time of permit issuance or reissuance, the permit may contain a compliance schedule consistent with the provisions in s. NR 106.117 when either of the following conditions is met:

**(1)** The permittee does not apply for an alternative effluent limitation under the provisions of subch. VI.

**(2)** The permittee applies for an alternative effluent limitation under the provisions of subch. VI and, after reviewing the data and information provided with the application, the department determines that sufficient information to establish alternative effluent limitations for temperature is not available.

**History:** CR 07-111: cr. Register September 2010 No. 657, eff. 10-1-10; CR 15-085: am. (intro.) Register August 2016 No. 728, eff. 9-1-16.

## Subchapter VI — Alternative Effluent Limitations for Temperature

**NR 106.70 Purpose.** The purpose of this subchapter is to establish procedures for the determination by the department of alternative effluent limitations for temperature as authorized under s. 283.17, Stats. An alternative effluent limitation for temperature may be established by the department if the owner or operator of a point source demonstrates to the department that a proposed effluent limitation established under subch. V is more stringent than necessary to assure the protection and propagation of a balanced indigenous population of shellfish, fish and wildlife in and on the body of water into which the discharge is made.

**History:** CR 07-111: cr. Register September 2010 No. 657, eff. 10-1-10.

**NR 106.71 Definitions.** The definitions in ss. NR 205.03 and 205.04 apply to the terms used in this subchapter. In addi-

tion, the following definitions apply to the terms used in this subchapter:

**(1)** "Alternative effluent limitations for temperature" means effluent temperature limitations for the control of the thermal component of a discharge which are less restrictive than limitations calculated using the procedures specified in subch. V.

**(2)** "Balanced, indigenous community" or "balanced, indigenous population" means a biotic community typically characterized by diversity, the capacity to sustain itself through cyclic seasonal changes, presence of necessary food chain species, and non–domination of pollution tolerant species. Such a community may include historically non–native species introduced in connection with a program of wildlife management and species whose presence or abundance results from substantial, irreversible environmental modifications. Normally, however, the community may not include species whose presence or abundance is attributable to the introduction of pollutants that will be eliminated by compliance by all sources with effluent limitations and standards effective by July 1, 1983, including modifications thereof in accordance with the provisions of this subchapter; and may not include species whose presence or abundance is attributable to alternative effluent limitations imposed pursuant to this subchapter.

**(3)** "Existing discharge" means a discharge that is not a new POTW discharge.

**(4)** "New discharge" means a discharge that is issued a WPDES permit on or after October 1, 2010.

**(5)** "Relevant evidence" means new or historical biological data, physical monitoring data and engineering or diffusion models.

**(6)** "Representative, important species" means species which are representative, in terms of their biological needs, of a balanced, indigenous community of shellfish, fish, and wildlife in and on the body of water receiving a thermal discharge.

**(7)** "Water quality standards" means applicable water quality standards set forth in chs. NR 102 to 104, or any federally promulgated water quality standards applicable to surface waters of the state.

**History:** CR 07-111: cr. Register September 2010 No. 657, eff. 10-1-10.

**NR 106.72 Application for alternative effluent limitations for temperature.** An application for an alternative effluent limitation may be submitted to the department by an owner or operator of a point source subject to effluent limitations determined under subch. V.

**(1)** TIMING. The application may be submitted at the time the owner or operator submits an application for issuance or reissuance of a WPDES permit or at any time following the issuance of a permit, subject to the permit modification provisions in s. 283.53, Stats.

**(2)** NEW DISCHARGE. A permittee may submit an application for alternative effluent limitations for temperature for a new discharge. The application shall include a demonstration that the effluent temperature limitations calculated according to the procedures specified in subch. V are more stringent than necessary to assure the protection and propagation of a balanced, indigenous community of shellfish, fish and wildlife in and on the body of water into which the discharge is made. This demonstration shall examine the interaction of the thermal component with other pollutants and the additive effect of other thermal sources. The application shall also contain all of the following:

(a) A description of the alternative effluent limitations for temperature requested.

(b) A description of the methodology the applicant used to support the demonstration.

(c) Biological, hydrological and meteorological data, physical monitoring data, engineering or diffusion models, laboratory studies and other relevant evidence.

(d) The data and results of studies, experiments and other information that support the demonstration that the identified representative, important species will be protected, and that will assure the protection and propagation of a balanced, indigenous community of shellfish, fish and aquatic life in and on the body of the water into which the discharge will be made.

**(3)** EXISTING DISCHARGE. An existing permittee may submit an application for alternative effluent limitations for temperature for an existing discharge. The application shall include a demonstration that the effluent temperature limitations calculated according to the procedures specified in subch. V are more stringent than necessary to assure the protection and propagation of a balanced, indigenous community of shellfish, fish and wildlife in and on the body of water into which the discharge is made. This demonstration shall examine the interaction of the thermal component with other pollutants and the additive effect of other thermal sources. The permittee may request alternative effluent limitations for temperature under either par. (a) or (b).

(a) A permittee may demonstrate that no appreciable harm has resulted from the normal component of the discharge to a balanced, indigenous community of shellfish, fish and wildlife in and on the body of water into which the discharge has been made. In determining whether or not prior appreciable harm has occurred, the department shall consider the length of time in which the applicant has been discharging and the nature of the discharge.

(b) A permittee may demonstrate that, despite the occurrence of previous appreciable harm, alternative effluent limitations for temperature will assure the protection and propagation of a balanced, indigenous community of shellfish, fish and wildlife in and on the body of water into which the discharge has been made.

(c) In the application under this section, the permittee shall provide all of the following:

1. A description of the alternative effluent limitations for temperature requested.

2. A description of the methodology the applicant used to support the demonstration.

3. Biological, hydrological and meteorological data, physical monitoring data, engineering or diffusion models and laboratory studies and other relevant evidence.

4. The data and results of studies, experiments and other information that support the demonstration that the identified representative, important species will be protected, and that will assure the protection and propagation of a balanced, indigenous community of shellfish, fish, and aquatic life in and on the water to which the discharge has been made.

**History:** CR 07-111: cr. Register September 2010 No. 657, eff. 10-1-10.

**NR 106.73 Identification of representative, important species.** Any applicant for an alternative effluent limitation for temperature shall submit to the department a proposed list of representative important species prior to submitting an application and undertaking a demonstration under s. NR 106.72. The list shall take into account applicable water quality standards. The department may approve, disapprove or approve with modifications the proposed list of representative important species as the department deems appropriate.

**History:** CR 07-111: cr. Register September 2010 No. 657, eff. 10-1-10.

**NR 106.74 Determination of alternative effluent limitations for temperature. (1)** NEW DISCHARGES. Alternative effluent limitations for temperature may be established by the department for a new discharge if the permittee demonstrates that the discharge, considering the cumulative impact of the thermal discharge together with all other significant impacts on the species affected will assure the protection and propagation of representative, important species and will, in turn, assure the protection and propagation of a balanced, indigenous community of shellfish, fish, and aquatic life in and on the body of receiving water.

**(2)** EXISTING DISCHARGES. Alternative effluent limitations for temperature may be established by the department for an existing discharge if the permittee has demonstrated either of the following:

(a) No appreciable harm has resulted from the thermal component of the discharge, taking into account the interaction of the component with other pollutants and the additive effect of other thermal discharges, to the representative, important species and a balanced, indigenous community of shellfish, fish, and wildlife in and on the body of water receiving the discharge.

(b) That despite the occurrence of previous appreciable harm, alternative effluent limitations for temperature will assure the protection and propagation of the representative, important species and a balanced, indigenous community of shellfish, fish and wildlife in and on the body of water into receiving the discharge, taking into account the interaction of the thermal component with other pollutants and the additive effect of other thermal discharges.

**(3)** APPRECIABLE HARM. In determining whether appreciable harm has occurred the department shall consider any relevant biological, engineering or other data demonstrating that effluent limitations for temperature calculated using the procedures specified in subch. V are more stringent than necessary to assure the protection and propagation of a balanced, indigenous community of shellfish, fish, and wildlife in and on the body of water receiving the discharge.

**(4)** EXISTING VARIANCE WATER LIMITATIONS. Alternative effluent limitations for temperature determined under this subchapter shall supersede any temperature limitations listed in s. NR 104.06 (2) (b).

**(5)** ZEBRA MUSSEL CONTROL. Alternative effluent limitations for temperature determined under this subchapter shall be met, except for short-term excursions for zebra or other mussel control, as approved by the department and authorized in a permit on a case-by-case basis.

**History:** CR 07-111: cr. Register September 2010 No. 657, eff. 10-1-10.

**NR 106.75 Compliance schedules.** Whenever the department issues or modifies a permit with alternative effluent limitations for temperature established using the procedures in this subchapter, the permit may contain a compliance schedule consistent with the provisions in s. NR 106.117 to attain such limitations. The permittee shall achieve compliance with the limitations as soon as reasonably possible, but no later than the expiration date of the permit.

**History:** CR 07-111: cr. Register September 2010 No. 657, eff. 10-1-10; CR 15-085: am. Register August 2016 No. 728, eff. 9-1-16.

**NR 106.76 Public notice.** The public notice of intent to issue, reissue, or modify a permit with alternative effluent limitations established under this subchapter shall contain all of the following:

**(1)** The effluent temperature limitations that are calculated using the procedures specified in subch. V.

**(2)** The proposed alternative effluent limitations for temperature.

**(3)** A statement that the applicant has submitted a demonstration in support of a request for alternative effluent limitations for temperature and that the department is proposing to establish such alternative effluent limitations for temperature or, in the event that at the time of permit issuance, reissuance or modification there is insufficient information to support alternative effluent limitations for temperature, that the department is proposing to include a compliance schedule in the permit.

**(4)** A statement that all data submitted by the applicant and a summary of the data are available at the offices of the department for public inspection during office hours.

**(5)** A statement that any interested person may comment upon the applicant's proposed alternative effluent limitations for temperature.

**History:** CR 07-111: cr. Register September 2010 No. 657, eff. 10-1-10.

**NR 106.77 Application of the variance process in s. 283.15, Stats.** Whenever a permittee has been granted alternative effluent limitations for temperature under this chapter, the procedures of s. 283.15, Stats., are not applicable.

**History:** CR 07-111: cr. Register September 2010 No. 657, eff. 10-1-10.

## Subchapter VII — Effluent Limitations for Chloride Discharges

**NR 106.80 Purpose.** The purpose of this subchapter is to specify how the department will regulate the discharge of chloride to surface waters of the state. Nothing in this subchapter shall be construed to prevent or prohibit the use, sale, rental, installation, and service of ion exchange water softeners.

**History:** Cr. Register, January, 2000, No. 529, eff. 2-1-00.

**NR 106.81 Applicability.** The provisions of this subchapter are applicable to point sources which discharge wastewater containing chloride to surface waters of the state. The provisions of this subchapter are not applicable to discharges of storm water run-off regulated by a storm water permit.

**History:** Cr. Register, January, 2000, No. 529, eff. 2-1-00.

**NR 106.82 Definitions.** In this subchapter:

**(1)** "Calculated limitation" means a chloride water quality-based effluent limitation.

**(2)** "Consistently meet" means that 95% of the representative effluent data are less than the calculated limitation.

**(3)** "DIR" means demand initiated regeneration.

**(4)** "Daily maximum interim limitation" means an effluent limitation calculated by the department which may be either:

(a) The upper 99th percentile of the permittee's representative data available to the department, or

(b) A value no greater than 105% of the permittee's highest representative effluent datum.

**(5)** "Reasonably meet" means that all of the permittee's representative effluent data would, using appropriate statistical techniques, be expected to be less than or equal to the target limitation following the completion of all of the source reduction efforts required by the permit.

**(6)** "Representative effluent data" means data, above the level of detection, which is not serially correlated and which represents normally expected effluent concentrations of chloride, collected during a period that can represent current or expected operations, or both, within the term of the permit.

**(7)** "Target limitation" means an effluent limitation which the permittee can reasonably meet within the term of the permit,

following implementation of appropriate voluntary source reduction activities.

**(8)** "Target value" means an effluent concentration of chlorides which a permittee may be expected to reasonably meet following implementation of appropriate voluntary source reduction activities. A target value is not an enforceable limitation under the terms of the permit program, but establishes a measure of progress of source reduction activities.

**(9)** "Weekly average interim limitation" means an effluent limitation calculated by the department which may be either:

(a) The upper 99th percentile of the permittee's 4-day average of the representative data available to the department, or

(b) A value no greater than 105% of the permittee's calculated highest weekly average of the representative effluent data.

**(10)** "WPDES" means Wisconsin pollutant discharge elimination system.

**History:** Cr. Register, January, 2000, No. 529, eff. 2-1-00.

**NR 106.83 Regulation of chloride discharges. (1)** CHLORIDE EFFLUENT LIMITATIONS. The department shall evaluate the need to establish effluent limitations for chloride whenever representative effluent data indicate that the discharge from a point source contains chloride. If the department determines that a water quality-based effluent limitation for chloride is needed, a calculated limitation as defined in s. NR 106.82 (1) shall be included in the permit to meet the applicable water quality standards specified in chs. NR 102 to 105, unless a chloride variance is given pursuant to sub. (2).

**(2)** CHLORIDE VARIANCE. (a) *Findings.* On February 1, 2000, the department finds that:

1. End-of-pipe wastewater treatment technology for chloride is prohibitively expensive;

2. End-of-pipe wastewater treatment technology for chloride produces a concentrated brine that can be as much or more of an environmental liability than the untreated effluent;

3. Appropriate chloride source reduction activities are preferable environmentally to end-of-pipe effluent treatment in most cases; and

4. For some dischargers, attaining the applicable water quality standards specified in chs. NR 102 to 105 may cause substantial and widespread adverse social and economic impacts in the area where the discharger is located.

5. These findings shall be reviewed by the department every 3 years.

(b) *Application.* An existing discharger seeking a chloride variance under this subsection shall submit an application for a chloride variance when it submits its application for permit reissuance. The application shall include the permittee's basis for concluding that the findings in sub. (2) (a) for a chloride variance are applicable to its discharge.

(c) *Department determinations.* The department shall review the application submitted by the permittee. The application shall be approved if the department agrees with the permittee's basis for concluding that the findings under par. (a) for a chloride variance are applicable to its discharge. The department shall obtain U.S. environmental protection agency approval before a variance is included in a permit under this subsection.

(d) *Permit conditions implementing a chloride variance.* The department shall grant a chloride variance to an existing discharger when:

1. The findings in par. (a) supporting a chloride variance apply to the specific discharge; and

2. The permittee and the department agree upon specific permit language imposing an interim limitation, a target value or, where appropriate, a target limitation, and source reduction activities.

**(3)** INTERIM LIMITATIONS, TARGET VALUES AND TARGET LIMITATIONS AND SOURCE REDUCTION ACTIVITIES. (a) If the permittee and the department agree on the inclusion of voluntary source reduction activities and the imposition of an interim limitation and a target value or a target limitation in its permit, those activities and the interim limitation and target value or target limitations shall become permit requirements.

(b) If the permittee and the department cannot agree on voluntary source reduction activities to be included as permit requirements, those activities may not be included in the permit. If the permittee and the department cannot agree on an interim limitation and target value or a target limitation to be included as permit requirements, those limitations may not be included in the permit.

(c) If the permittee and the department cannot agree on voluntary source reduction activities and both an interim limitation and a target value or an interim limitation and a target limitation to be included as permit requirements, the department shall include a calculated limitation as defined in s. NR 106.82 (1) in the permit to meet the applicable water quality standards specified in chs. NR 102 to 105.

**(4)** REAPPLICATION FOR A CHLORIDE VARIANCE. When a permit containing a chloride variance approved by the department under sub. (2) (c) expires, the permittee may reapply for a chloride variance when it submits its application for permit reissuance. The application shall include the permittee's basis for concluding that the findings in sub. (2) (a) are applicable to its discharge.

**(5)** APPLICABILITY OF THE VARIANCE PROCESS IN S. 283.15, STATS. If a calculated limitation is included in the permit, a permittee may apply to the department for a variance from the water quality standard used to derive the calculated limitation, pursuant to s. 283.15, Stats. Where a permittee has been granted a chloride variance and its permit includes an interim limitation, a target value, a target limitation and requirements for chloride source reduction activities, the provisions of s. 283.15, Stats., are not applicable to the interim and target limitations.

**History:** Cr. Register, January, 2000, No. 529, eff. 2-1-00; CR 15-085: am. (2) (c) Register August 2016 No. 728, eff. 9-1-16.

**NR 106.84 Compliance with Wisconsin water quality antidegradation rules when reissuing a permit.** Chapter NR 207 does not apply in those instances in which a reissued permit includes effluent limitations for chloride which represent a lowering of concentration as compared to the interim limitation in the previous permit.

**History:** Cr. Register, January, 2000, No. 529, eff. 2-1-00.

**NR 106.85 Determination of the necessity for water quality-based effluent limitations. (1)** The department shall determine the need for chloride water quality-based effluent limitations for point source discharges whenever the discharges from the point sources contain chloride at concentrations or loadings which do not, as determined by any method in this section, meet the applicable water quality standards specified in chs. NR 102 to 105.

**(2)** When considering the necessity for water quality-based effluent limitations, the department shall consider in-stream biosurvey data and data from ambient toxicity analyses whenever the data are available.

**(3)** When considering the necessity for chloride water quality-based effluent limitations, the department shall compare the

upper 99th percentile of available representative discharge concentrations to the calculated limitations, pursuant to s. NR 106.05 (4).

**History:** Cr. Register, January, 2000, No. 529, eff. 2-1-00.

**NR 106.86 Monitoring.** Notwithstanding any other section in this subchapter, the department shall determine on a case-by-case basis the chloride monitoring frequency to be required in the permit.

**History:** Cr. Register, January, 2000, No. 529, eff. 2-1-00.

**NR 106.87 Establishment of effluent limitations. (1)** CALCULATED LIMITATIONS. If water quality-based effluent limitations for chloride are determined to be necessary, those limitations shall be derived under ss. NR 106.06 and 106.07, and for the purposes of this subchapter, shall be labeled "calculated limitations".

**(2)** INTERIM LIMITATION. The interim limitation may be expressed as both a daily maximum and a weekly average, calculated in accordance with s. NR 106.82 (4) and (9).

**(3)** TARGET VALUE. The target value may be expressed as both a daily maximum and a weekly average. The department and the permittee shall consider both the implementation and the anticipated effectiveness of appropriate voluntary source reduction activities in order to determine a target value which is reasonably achievable within the term of the permit.

**(4)** TARGET LIMITATION. The target limitation may be expressed as both a daily maximum and a weekly average. The department and the permittee shall consider both the implementation and the anticipated effectiveness of appropriate voluntary source reduction activities in order to determine a target limitation which is reasonably achievable within the term of the permit.

**History:** Cr. Register, January, 2000, No. 529, eff. 2-1-00; CR 15-085: am. (1) Register August 2016 No. 728, eff. 9-1-16.

**NR 106.88 Application of and compliance with chloride effluent limitations in a permit. (1)** CHLORIDE LIMITATIONS IN PERMITS. If chloride water quality-based effluent limitations are deemed to be necessary under s. NR 106.85, the department shall use all of the following procedures to include the calculated limitations in the permit with an appropriate compliance schedule as necessary and appropriate:

(a) Effluent limitations based on an acute criterion shall be expressed in permits as daily maximum limitations, and effluent limitations based on a chronic criterion shall be expressed in permits as weekly average limitations.

(b) Effluent Limitations shall be expressed in a permit consistent with the protocols in s. NR 106.07 (3) to (5).

(c) Mass limitations calculated under s. NR 106.07 (2) and (9) shall be included in the permit in addition to concentration based effluent limitations whenever water quality-based effluent limitations are determined to be necessary.

(d) A compliance schedule for a water quality-based effluent for chloride may be granted in a permit if necessary and appropriate and shall be consistent with the requirements under s. NR 106.117.

**(2)** VARIANCE CONDITIONS. The department may include all of the following conditions in the permit instead of the conditions specified in sub. (1) whenever a chloride variance is granted under s. NR 106.83:

(a) Chloride monitoring.

(b) An interim limitation for chloride that is effective on the date of permit issuance.

(c) Tier 1 source reduction.

(d) A target value or a target limitation with an appropriate compliance schedule, which is effective on the last day of the permit.

(e) If appropriate, either tier 2 or tier 3 source reduction if the department believes that any of the additional conditions in the tier 2 or tier 3 source reduction activities are reasonable and practical within the term of the permit.

**(3)** UNITS FOR TARGET VALUES. Interim limitations, target values, and target limitations established under sub. (2) shall be expressed in the permit as a concentration limitation, in units of mg/L or equivalent units.

**(5)** MONITORING. A determination of compliance with interim, target, and calculated limitations and comparison with target values shall be based upon 24-hour composite samples. The department shall determine on a case-by-case basis the monitoring frequency to be required for these limitations.

**History:** Cr. Register, January, 2000, No. 529, eff. 2-1-00; CR 09-123: am. (3) Register July 2010 No. 655, eff. 8-1-10; CR 15-085: r. and recr. (1) to (3), r. (4), r. and recr. (5), r. (6) Register August 2016 No. 728, eff. 9-1-16.

**NR 106.89 Alternative whole effluent toxicity monitoring and limitations for dischargers of chloride. (1)** GENERAL. In addition to interim, target, and calculated water quality-based effluent limitations and target values for chloride, the department may establish whole effluent toxicity testing requirements and limitations under ss. NR 106.08 and 106.09.

**(2)** FINDINGS. The department finds all of the following:

(a) Acute whole effluent toxicity limitations cannot be attained if the effluent concentration of chloride exceeds 2,500 mg/L.

(b) Chronic whole effluent toxicity limitations cannot be attained if the effluent concentration of chloride exceeds 2 times the calculated chronic water quality-based effluent limitation.

(c) If chloride is the sole source of acute or chronic whole effluent toxicity it is appropriate that chloride limitations be used instead of WET limitations to attain and maintain narrative criteria in s. NR 102.04 (1) (d) and (4) (d).

**(3)** CHLORIDE LIMITS IN LIEU OF ACUTE WET LIMITS. Chloride limitations shall be included in the permit in lieu of acute whole effluent toxicity testing requirements and acute whole effluent toxicity limitations until source reduction actions are completed if any of the following apply:

(a) The permittee can demonstrate to the satisfaction of the department that the effluent concentration of chloride exceeds 2,500 mg/L.

(b) The permittee can demonstrate to the satisfaction of the department that the effluent concentration of chloride is less than 2,500 mg/L, but in excess of the calculated acute water quality-based effluent limitation, and additional data are submitted that demonstrate that chloride is the sole source of acute toxicity.

**(4)** CHLORIDE LIMITS IN LIEU OF CHRONIC WET LIMITS. Chloride limitations shall be included in the permit in lieu of chronic whole effluent toxicity testing requirements and chronic whole effluent toxicity limitations until source reduction actions are completed if either of the following applies:

(a) The permittee can demonstrate to the satisfaction of the department that the effluent concentration of chloride exceeds 2 times the calculated chronic water quality-based effluent limitation.

(b) The permittee can demonstrate to the satisfaction of the department that the effluent concentration of chloride is less than 2 times the calculated chronic water quality-based effluent limitation, but in excess of the calculated chronic water quality-based

effluent limitation, and additional data are submitted which demonstrate that chloride is the sole source of chronic toxicity.

**(5)** DECISION DOCUMENTATION. The department shall specify the decision to include chloride limitations instead of whole effluent toxicity limitations in the permit fact sheet.

**(6)** REEVALUATION. The department shall reevaluate the need for whole effluent toxicity and chloride monitoring or limitations upon permit reissuance.

**History:** Cr. Register, January, 2000, No. 529, eff. 2-1-00; CR 15-085: r. and recr. Register August 2016 No. 728, eff. 9-1-16; correction in (2) (c) made under s. 35.17, Stats., Register August 2016 No. 728.

**NR 106.90 Source reduction. (1)** INTRODUCTION. A 3-tiered system of source reduction measures is established in ascending order of increasing capital and operating costs.

**(2)** Tier 1 source reduction measures are those voluntary source reduction activities that identify and quantify chloride and softened water sources and usage, educate users and system operators on the need to minimize salt and softened water demands and promote better housekeeping practices that will reduce chloride and softened water consumption, and other activities similar in nature. Tier 1 source reduction measures may include any of the following:

(a) For POTWs:

1. Identify sources of chloride to the sewer system.

2. Educate homeowners on the impact of chloride from residential softeners, discuss options available for increasing softener salt efficiency, and request voluntary reductions.

3. Recommend residential softener tune-ups on a voluntary basis.

4. Request voluntary support from local water softening businesses in the efforts described in subds. 2. and 3.

5. Educate licensed installers and self-installers of softeners on providing optional hard water for outside faucets for residences.

6. Request voluntary reductions in chloride input from industrial and commercial contributors.

7. Where a public water utility has been identified as a significant contributor of chloride to the sewer system, request that the water utility conduct activities listed in par. (b).

(b) For direct-discharging municipal or commercial water softening plants:

1. Identify the users of soft water or the processes using soft water, and the amounts they use.

2. Determine which users or processes can tolerate unsoftened water, and determine their impact on demand.

3. Determine which users can close-loop their once-through cooling system or which processes can be close-looped, and determine their impact on demand.

4. Seek voluntary demand reductions.

(c) For dairies, train plant personnel to be more aware of salt conservation, emphasizing simple, cost effective housekeeping measures. For example, spilled salt can be cleaned up as a solid waste rather than flushed down the floor drain.

(d) For those facilities which process vegetables or meats:

1. Train personnel as described in par. (c) in housekeeping measures.

2. Optimize softener operation to ensure the appropriate regeneration interval and salt dosage are used.

(e) For any other facility not listed in pars. (a) to (d), conduct activities that identify and quantify chloride and softened water sources and usage and educate personnel on appropriate housekeeping practices and the need to minimize salt and softened water demands.

**(3)** Tier 2 source reduction measures are those voluntary source reduction activities that improve and optimize equipment and processes, encourage restricted chloride use by users, eliminate wasteful practices and establish recycling practices where feasible, and other activities similar in nature. Tier 2 source reduction measures may include any of the following:

(a) For POTWs, institute sewer use ordinances that:

1. Require significant industrial and commercial contributors to evaluate their water treatment systems with regard to softened water requirements, with the results of that evaluation being the basis for potential restrictions of chloride inputs.

2. Mandate a DIR and high salt efficiency standard for new residential softeners.

3. Mandate participation in a residential softener tune-up program, which involves qualified periodic servicing to ensure proper control settings and adjustments.

4. Where a public water utility has been identified as a significant contributor of chloride to the sewer system, request that the water utility conduct activities listed in par. (b).

(b) For direct-discharging municipal or commercial water softening plants:

1. Optimize softener operation to ensure the appropriate regeneration interval and salt dosage are used.

2. If the regeneration is manual or timer-initiated, switch to a DIR controller.

3. Evaluate the feasibility of brine reclamation.

(c) For dairies:

1. Improve the handling of salt brines and the handling of cheese into and out of brine systems. Consider capital improvements such as automating the brine system, properly designed drip pans and splash guards.

2. Optimize softener operation to ensure the appropriate regeneration interval and salt dosage are used.

3. If the regeneration is manual or timer-initiated, evaluate the feasibility of switching to a DIR controller.

4. Evaluate the feasibility of softener brine reclamation.

5. Determine which subprocesses can tolerate unsoftened water, and make appropriate changes.

6. Determine whether once-through cooling systems can be close-looped, and make appropriate changes.

7. For plants that condense whey, evaluate the feasibility of using condensate of whey (COW) water for the first rinse for clean-in-place (CIP) systems and for boiler makeup water.

(d) For those facilities which process vegetables:

1. If the regeneration is manual or timer-initiated, evaluate the feasibility of switching to a DIR controller.

2. Evaluate the feasibility of softener brine reclamation.

3. Investigate the feasibility of using a phosphonate additive instead of softening the cooling water.

4. Evaluate the feasibility of reusing once-through cooling water as boiler make-up.

5. Investigate the feasibility of using unsoftened water for container fill.

(e) For those facilities which process meats:

1. If the regeneration is manual or timer-initiated, evaluate the feasibility of switching to a DIR controller.

2. Evaluate the feasibility of softener brine reclamation.

(f) For any other facility not listed in pars. (a) to (e), conduct activities that improve and optimize equipment and processes,

eliminate wasteful practices and establish recycling practices to achieve chloride reductions.

**(4)** Tier 3 source reduction measures are those voluntary source reduction activities that evaluate the feasibility of replacing or upgrading equipment and processes or evaluate the feasibility of using alternative technologies or processes, and other activities similar in nature. Tier 3 source reduction measures may include any of the following:

(a) For POTWs, where residential point-of-use softening is the primary chloride input:

1. Evaluate the requirement for new and replacement softeners to be metered demand type, with a higher, greater than 3350 grains of hardness exchange per pound of salt, efficiency capability.

2. Evaluate the imposition of installation restrictions so that outside hose bibs are on unsoftened water. If restrictions are imposed, new homes and those in real estate transfers should be required to have plumbing restrictions for hard water by-passes, and the requirement should apply to self-installed equipment as well.

(b) For POTWs, where a central water supply softener is the primary chloride input, conduct activities listed in par. (c).

(c) For direct-discharging municipal or commercial water softening plants:

1. Evaluate the feasibility of achieving greater salt efficiencies, greater than 3350 grains of hardness exchange per pound of salt.

2. Evaluate softening alternatives that replace the sodium cycle ion exchange method of softening.

3. Blend softened and unsoftened water to strike a balance between delivered water quality and environmental protection.

(d) For dairies:

1. For plants that make brine salted cheeses, evaluate the feasibility of membrane filtration for reconditioning the brine so that it can be reused.

2. For plants that make brine salted cheeses, evaluate the feasibility of using a no-brine make procedure in which salt is added directly to curd during the manufacturing procedure, thereby reducing salt discharges from spent brines.

(e) For those facilities which process vegetables:

1. Evaluate the feasibility of eliminating brine flotation for quality grading, if applicable.

2. Evaluate the feasibility of installing a closed-loop system for cooling water.

3. Evaluate the feasibility of installing a brine recovery and reuse system for reducing salt waste at the point of supplying flavorings to containers.

(f) For those facilities which process meats:

1. Investigate the feasibility of replacing brine chills with air, water or air-water chills.

2. Reduce drainback through operational and equipment improvements.

3. Investigate the feasibility of chill brine reconditioning and reuse.

4. Evaluate the feasibility of reusing once-through cooling water, or installing a closed-loop cooling water system.

5. Evaluate phosphonate additives instead of softened water.

(g) For any other facility not listed in pars. (a) to (f), evaluate the feasibility of replacing or upgrading equipment and processes, and the use of alternative softening technologies to affect chloride reductions.

**(5)** SOURCE REDUCTION REPORTING. Following the completion of tier 1, 2 or 3 source reduction activities specified in the permit, but no later than 6 months prior to permit expiration, the permittee shall file a written report to the department documenting the current reduction as well as the anticipated future reduction in salt usage and chloride effluent concentrations.

**History:** Cr. Register, January, 2000, No. 529, eff. 2-1-00.

**NR 106.91 Variances for POTWs which accept wastewater from public water systems treating water to meet primary safe drinking water act standards.** Publicly owned treatment works that accept wastewater from a public water system treating water to meet the primary maximum contaminant levels specified in ch. NR 809, if not able to meet the calculated limitation, may apply to the department for a variance from the water quality standard used to derive the limitation following the procedure specified in this subchapter. The department shall seek U.S. environmental protection agency approval before a variance is included in a permit. Upon approval, the permittee may be given an interim limitation, a target value, a target limitation and appropriate source reduction requirements, under s. NR 106.83 in the permit upon permit reissuance or modification. No calculated limitation, interim limitation, target value, target limitation, or source reduction requirement shall interfere with the attainment of the primary maximum contaminant levels specified in ch. NR 809.

**History:** Cr. Register, January, 2000, No. 529, eff. 2-1-00; CR 15-085: am. Register August 2016 No. 728, eff. 9-1-16.

**NR 106.92 Authority of a publicly owned treatment works to regulate chloride discharges.** A publicly owned treatment works has the authority to regulate the discharge of chloride as enumerated in s. NR 211.40.

**History:** Cr. Register, January, 2000, No. 529, eff. 2-1-00.

**NR 106.93 New discharges.** Any point source which has not been authorized under a WPDES permit prior to February 1, 2000, shall be required to meet the calculated limitations. Relocation of an existing discharge which was issued a WPDES permit prior to February 1, 2000, may not be considered a new discharge.

**History:** Cr. Register, January, 2000, No. 529, eff. 2-1-00.

**NR 106.94 Relocation of an existing discharge.** An existing discharge which was issued a WPDES permit prior to February 1, 2000, and which is relocated after February 1, 2000, may be subject to voluntary source reduction activities and both an interim limitation and a target value or an interim limitation and a target limitation pursuant to s. NR 106.83 if the provisions of ch. NR 207 are met. Relocation includes the diversion of a discharge from a land treatment system to a surface water.

**History:** Cr. Register, January, 2000, No. 529, eff. 2-1-00.

**NR 106.95 Multiple discharges.** The provisions of s. NR 106.11 are applicable to multiple discharges of chloride.

**History:** Cr. Register, January, 2000, No. 529, eff. 2-1-00.

**NR 106.96 Analytical methods and laboratory requirements.** The provisions of s. NR 106.14 regarding analytical methods, sample handling and laboratory requirements are applicable to discharges of chloride.

**History:** Cr. Register, January, 2000, No. 529, eff. 2-1-00.

## Subchapter VIII — Permit Requirements for PFOS and PFOA Discharges

**NR 106.97 Purpose.** The purpose of this subchapter is to specify how the department will regulate the discharge of PFOS and PFOA in wastewater to surface waters of the state that are

subject to the PFOS and PFOA standards under s. NR 102.04 (8) (d) 1. pursuant to the permitting program under ch. 283, Stats.

**History:** CR 21-083: cr. Register July 2022 No. 799, eff. 8-1-22.

**NR 106.975 Definitions.** In this subchapter:

**(1)** "Composite sample" has the meaning specified in s. NR 218.04 (11).

**(2)** "Equipment blank" means a sample collected by passing laboratory-verified PFAS-free water over or through field sampling equipment before the collection of field samples to evaluate potential contamination from the equipment used during sampling.

**(3)** "Grab sample" has the meaning specified in s. NR 218.04 (10).

**(4)** "Major municipal discharger" means a treatment works or system that has a major municipal discharge as defined in s. NR 200.02 (7).

**(5)** "Minor municipal discharger" means a treatment works or system that has a minor municipal discharge as defined in s. NR 200.02 (8).

**(6)** "Municipal discharger" means all publicly operated treatment works and privately owned domestic sewage treatment works subject to the requirements under ch. NR 210.

**(7)** "New discharger" means any building, structure, facility, or installation from which there is or may be a discharge of pollutants, that is not a new source, and that did not commence the discharge of pollutants at a particular site prior to August 1, 2022, and which has never received a finally effective WPDES permit for discharges at that site.

**(8)** "New source" has the meaning specified in s. NR 106.117.

**(9)** "PFAS" means a perfluoroalkyl or polyfluoroalkyl substance that contains a straight or branching chain of carbon atoms in which one or more of the carbon atoms have fluorine atoms attached at all bonding sites not occupied by another carbon atom and the fluorinated part of the molecule can be expressed as $C_nF_{2n+1}$.

**(10)** "Perfluorooctanoic acid" or "PFOA" has the meaning specified in s. NR 102.03 (4e).

**(11)** "Perfluorooctane sulfonate" or "PFOS" has the meaning specified in s. NR 102.03 (4m).

**(12)** "Primary industry" has the meaning specified in s. NR 200.02 (15).

**(13)** "Secondary industry" has the meaning specified in s. NR 200.02 (17).

**(14)** "Source reduction activities" means structural or nonstructural measures, practices, techniques, activities, or devices employed to reduce or eliminate the transfer of PFOS and PFOA from sources into surface waters of the state.

**(15)** "Treatment works" has the meaning specified in s. 283.01 (18), Stats.

**(16)** "WPDES permit" means the Wisconsin pollutant discharge elimination system permit issued by the department under ch. 283, Stats., for the discharge of pollutants.

**History:** CR 21-083: cr. Register July 2022 No. 799, eff. 8-1-22.

**NR 106.98 Determination of the necessity for reducing PFOS and PFOA in discharges. (1)** GENERAL. This section establishes the procedures for determining when a permitted discharge has the reasonable potential to cause or contribute to an exceedance of the PFOS or PFOA standards under s. NR 102.04 (8) (d) 1.

**(2)** DATA GENERATION. At the first reissuance of a WPDES permit after August 1, 2022, the department shall require in the reissued permit that the permittee monitor and report PFOS and PFOA at the frequencies and locations specified under this subsection, for up to 2 years, except if a waiver has been granted or reduced frequency is approved under sub. (3). All samples shall be collected and analyzed consistent with the requirements under ch. NR 219 and s. NR 106.995. The following sample frequencies apply to each category of permitted dischargers:

(a) For a major municipal discharger with an average flow rate greater than or equal to 5 million gallons per day, the permittee shall, at a minimum, sample its effluent on a monthly basis. Influent monitoring will be determined on a case-by-case basis and shall be conducted at a frequency specified in the permit.

(b) For a major municipal discharger with an average flow rate greater than or equal to one million gallons per day but less than 5 million gallons per day, the permittee shall, at a minimum, sample its effluent once every 2 months. Influent monitoring will be determined on a case-by-case basis and shall be conducted at a frequency specified in the permit.

(c) For all other municipal dischargers, the permittee may only be required to sample for PFOS or PFOA if the department determines that PFOS or PFOA may be present in the discharge. In making this determination, the department shall consider the presence of potential PFOS or PFOA industrial wastes to the treatment works, the presence of nearby PFOS or PFOA remediation sites, and the presence of other potential sources of PFOS or PFOA that may contribute to any part of the minor municipal discharger. If the department determines that PFOA or PFOS may be present in the discharge, the department shall require that the permittee sample its influent and effluent at a frequency specified in the permit.

(d) For a primary or secondary industrial discharger, if the department determines that the permittee's effluent may contain PFOS or PFOA, the department shall require that the permittee sample its effluent at least monthly.

(e) The department may require PFOS or PFOA monitoring for other discharges not included in one of the categories specified under pars. (a) to (d) if the department has a reasonable expectation that the discharge contains PFOS or PFOA at levels that will likely cause or contribute to an exceedance of the criteria under s. NR 102.04 (8) (d) 1.

**Note:** The department has authority to sample the effluent from permitted facilities under s. 283.55, Stats.

**Note:** The department has authority under s. NR 205.066 (1) to specify monitoring frequency for PFOS and PFOA in WPDES permits at its discretion on a case-by-case basis after 24 months.

**(3)** REDUCED SAMPLE FREQUENCY AND WAIVER. (a) The department may reduce monitoring frequency to once every 3 months for dischargers described under sub. (2) (a), (b) or (d) on a case-by-case basis, but only after at least 12 representative results have been generated.

(b) The department may waive the requirement to conduct PFOS or PFOA sampling for a discharger under sub. (2) if the department determines that it is unlikely that the permittee's effluent will contain PFOS or PFOA at levels above the criteria in s. NR 102.04 (8) (d) 1. Any approved waivers shall be reviewed at each permit reissuance to determine whether any changes were made at the permitted facility or when the department becomes aware of new information that may result in new or increased discharges of PFOS or PFOA, in which case monitoring may be required.

**(4)** DETERMINATION OF THE NEED FOR A PFOS AND PFOA MINIMIZATION PLAN. The department shall require creation and implementation of a PFOS and PFOA minimization plan that meets the requirements under s. NR 106.99 as a condition of a

WPDES permit whenever the department determines that the discharge from the permitted facility contains PFOS or PFOA at concentrations that have reasonable potential to cause or contribute to an exceedance of the PFOS or PFOA standard in s. NR 102.04 (8) (d) 1. When determining whether a permitted discharge has the reasonable potential to cause or contribute to an exceedance of the PFOS or PFOA standard in s. NR 102.04 (8) (d) 1., the department shall use the methods in this subsection to make the determination and shall use representative data that meet the sampling and analysis requirements under ch. NR 219 and s. NR 106.995. When making a reasonable potential determination for a permitted discharge of PFOS or PFOA under this subsection, the department shall consider whether the intake provisions in s. NR 106.06 (6) (b) apply to the discharge. When calculating a water quality based effluent limitation for PFOS in the reasonable potential determination, the department shall apply the requirements in s. NR 106.06 (1) and (6) in the calculation and shall use the applicable PFOS criterion in s. NR 102.04 (8) (d) 1. A mixing zone under s. NR 106.06 (2) may not be included in the limit calculation for a discharge of PFOS. When calculating a water quality based effluent limitation for PFOA in the reasonable potential determination, the department shall apply the requirements in s. NR 106.06 (1) and (4) to (11) in the calculation and shall use the applicable PFOA criterion in s. NR 102.04 (8) (d) 1. If any one of the following methods indicate that there is reasonable potential for an exceedance of either the PFOS or PFOA standard, a PFOS and PFOA minimization plan shall be required in the permit:

(a) If at least 11 daily discharge concentrations of the substance are greater than the limit of detection, a PFOS and PFOA minimization plan is required for a permitted facility if the upper 99th percentile of the 30-day average discharge concentrations for PFOS or PFOA exceeds the applicable water quality based effluent limitation calculated under this subsection. To calculate upper 99th percentile values of the daily discharge concentrations, one of the following shall be used:

1. If a log normal probability distribution is determined to be appropriate, the upper 99th percentile of the 30-day average discharge concentrations may be calculated using the equation under s. NR 106.05 (5) (a).

2. If a probability distribution other than log normal is determined to be more appropriate and alternate methods are available, those methods may be used to calculate the upper 99th percentile.

(b) If fewer than 11 daily discharge concentrations of the substance are greater than the limit of detection, a PFOS and PFOA minimization plan is required for a permitted facility if the arithmetic average discharge concentration exceeds one-fifth of the applicable water quality based effluent limitation calculated under this subsection. The arithmetic average discharge concentration shall be calculated using all available representative discharge data, applying the following principles:

1. If, in the judgment of the department, the analytical methods used to test for the substance represent acceptable methods, all values reported as less than the limit of detection shall be set equal to zero for calculation of the average concentration.

2. If, in the judgment of the department, the analytical methods used to test for the substance do not represent the best acceptable methods, all values reported as less than the limit of detection shall be discarded from the data.

**History:** CR 21-083: cr. Register July 2022 No. 799, eff. 8-1-22.

**NR 106.985 PFOS and PFOA minimization plans, permit implementation procedures schedule. (1)** GENERAL. If the department determines a permittee has reasonable potential to cause or contribute to an exceedance of the PFOS or PFOA standard in s. NR 102.04 (8) (d) 1. based on the reasonable potential procedures and data collected under s. NR 106.98, the department shall notify the permittee in writing that a PFOS and PFOA minimization plan that satisfies the requirements in s. NR 106.99 is required.

**Note:** The department intends to make the reasonable potential determination during the term of the first reissued permit under s. NR 106.98 (2) as soon as the effluent sampling is completed. If the department determines that a permittee has reasonable potential to cause or contribute to an exceedance of the PFOS or PFOA standard, the department will modify the permit pursuant to the public notice and public participation procedures under ch. 283, Stats., and ch. NR 203 to incorporate the PFOS and PFOA minimization plan and other related terms and conditions, including annual progress reporting requirements and a schedule of compliance to meet applicable water quality based effluent limitations into the permit.

**(2)** SCHEDULES. The following timeline applies to a permittee that receives written notification that a PFOS and PFOA minimization plan is required under sub. (1):

(a) The permittee shall submit an initial PFOS and PFOA minimization plan that contains applicable goals and actions listed in s. NR 106.99 for department review and approval no later than 90 days after written notification under sub. (1) was sent from the department. The department may approve, conditionally approve, or reject the plan. The department shall provide a written response to the permittee within 120 days of receiving the plan and, if the initial plan is rejected, the response shall explain the reasons for the rejection. The permittee shall submit a revised plan that addresses all deficiencies and concerns within 30 days of department notification.

(b) As soon as possible after department approval of the PFOS and PFOA minimization plan, the department shall modify or revoke and reissue the permit in accordance with the public notice and public participation procedures required under ch. 283, Stats., and ch. NR 203 to include the PFOS and PFOA minimization plan and other related terms and conditions, including annual progress reporting requirements and a schedule of compliance to meet applicable water quality based effluent limitations. After the permit has been modified or revoked and reissued the permittee shall implement actions identified in the approved plan and report annually to the department on the progress of the PFOS and PFOA minimization plan. The annual PFOS and PFOA minimization plan report shall include all of the following:

1. An analysis of trends in total effluent concentrations based on sampling, and for municipal dischargers an analysis of how influent and effluent concentrations vary with time and with significant loading of PFOS and PFOA.

2. A summary of activities that have been implemented during the previous year and description of which, if any, activities from the approved PFOS and PFOA minimization plan were not pursued and why.

3. An assessment of whether each implemented PFOS and PFOA minimization action appears to be effective or ineffective at reducing pollutant discharge concentrations and identification of actions planned for the upcoming year.

4. Identification of barriers that have limited the plan's effectiveness and adjustments to the plan that will be implemented during the next year to help address these barriers.

(c) A permittee may be allowed up to a maximum period of 85 months from the date the permit was modified or revoked and reissued to include the initial PFOS and PFOA minimization plan to implement PFOS and PFOA source reduction activities. After the initial PFOS and PFOA minimization plan is incorporated into the permit under par. (b), prior to each subsequent permit reissuance within the maximum 85 month period, the department shall evaluate whether levels of PFOS or PFOA in the effluent still have the reasonable potential to cause or contribute to an exceedance of the standard pursuant to s. NR 106.98 (4). If the de-

partment determines that levels of PFOS or PFOA in the effluent no longer have the reasonable potential to cause or contribute to an exceedance of the standard, the department may remove future PFOS and PFOA minimization plan requirements and future scheduled actions. However, the department shall include terms and conditions in the permit in accordance with the requirements in sub. (3). If the department determines that levels of PFOS or PFOA in the effluent still have the reasonable potential to cause or contribute to an exceedance of the PFOS or PFOA standard and there are feasible effective PFOS or PFOA source reduction activities that the permittee can still implement, the department may include the PFOS and PFOA minimization plan with source reduction activities in the reissued permit as a condition of the schedule. The department may require submittal of an updated PFOS and PFOA minimization plan as part of the reissuance application, or the permittee may choose to submit a revised PFOS and PFOA minimization plan. All revised PFOS and PFOA minimization plans are subject to department review and approval. If, however, the department or the permittee determine that there are no more feasible effective PFOS or PFOA source reduction activities that a permittee can implement, then the source reduction activities have been completed and par. (d) applies.

(d) After the actions in pars. (a) to (c) have been completed, all of the following requirements apply:

1. For PFOS, after a permittee has completed all feasible PFOS source reduction activities within the maximum allowable period of 85 months, if the department determines levels of PFOS in the permitted discharge still have the reasonable potential, as determined using the procedures in s. NR 106.98 (4), to cause or contribute to an exceedance of the PFOS standard in s. NR 102.04 (8) (d) 1., the permittee shall be required to achieve compliance with a water quality-based effluent limitation that is calculated using the procedure in s. NR 106.98 (4). The limit shall be expressed as a monthly average and in accordance with the requirements in s. NR 106.07 unless impracticable.

2. For PFOA, after a permittee has completed all feasible PFOA source reduction activities within the maximum allowable period of 85 months, if the department determines levels of PFOA in the discharge still have the reasonable potential, as determined under the procedures in s. NR 106.98 (4), to cause or contribute to an exceedance of the PFOA standard in s. NR 102.04 (8) (d) 1., a water quality-based effluent limitation for PFOA shall be included in the permit. The limitation shall be calculated using the calculation procedures in s. NR 106.98 (4). The PFOA limitation shall be expressed as a monthly average and in accordance with the requirements in s. NR 106.07 unless impracticable.

3. The department may provide additional time in the compliance schedule consistent with the requirements under s. NR 106.117 to achieve compliance with the water quality-based effluent limitations as soon as reasonably possible.

4. The department shall require continued monitoring of PFOS and PFOA with the water quality-based effluent limitation at a frequency specified in the permit and may require continued monitoring in the permit even if a water quality-based effluent limit for PFOS or PFOA is not required in the permit under this subsection.

**(3)** MAINTENANCE OF PFOS AND PFOA EFFLUENT QUALITY. If implementation of the PFOS and PFOA minimization plan reduces or eliminates the discharge of PFOS and PFOA to a level where the permitted discharge no longer has the reasonable potential to cause or contribute to an exceedance of the PFOS or PFOA standards under s. NR 102.04 (8) (d) 1., the permittee shall maintain effluent quality below the standards. The department may require continued monitoring of PFOS and PFOA and may include requirements in a permit to ensure maintenance of effluent quality.

**History:** CR 21-083: cr. Register July 2022 No. 799, eff. 8-1-22.

**NR 106.99 PFOS and PFOA minimization plans. (1)** GENERAL. A PFOS and PFOA minimization plan shall include similar types of goals and actions that are required for pollutant minimization programs under s. NR 106.04 (5). The plan shall be implemented in a manner that reduces PFOS and PFOA concentrations to the maximum extent practicable and shall include all of the following:

(a) Identification of specific PFOS and PFOA source reduction activities to be undertaken and a relative timeline to implement those activities.

(b) A list of PFOS and PFOA source reduction activities that have been implemented prior to submission of the plan, if any, and a description of how effective those activities were in reducing potential and actual PFOS or PFOA discharges, concentrations, or sources.

(c) An explanation of how implementation of the PFOS and PFOA minimization plan will be documented, including measures such as the number of contacts of various types made, programs implemented, and other activities.

(d) Steps to measure the effectiveness of the PFOS and PFOA minimization plan elements in reducing potential and actual PFOS and PFOA discharges. Where the permittee regularly monitors influent, effluent, sludge, or biosolids for PFOS and PFOA, measures shall include any changes in PFOS and PFOA concentrations over comparable historic data. When practicable, other measures or estimates of PFOS and PFOA reductions from programs such as PFOS and PFOA recycling, collection, or safe disposal may also be included.

**(2)** MUNICIPAL DISCHARGER PLANS. In addition to the actions under sub. (1), for permitted municipal dischargers, a PFOS and PFOA minimization plan shall consist of all of the following elements:

(a) *Source identification.* The permittee shall establish an inventory of treatment system users to identify dischargers to the municipal treatment system that may be significant sources of PFOS or PFOA.

**Note:** The following types of users are examples of users that have the potential to be significant sources of PFOS or PFOA: (a) Metal finishers that are using, or have used, PFAS-containing wetting agents, demisters, defoamers, or surfactants in their plating tanks; (b) Landfills that have accepted waste from metal finishers using hexavalent chromium or other industries associated with PFAS use, including tanneries, fabric or leather treaters, or paper manufacturers; (c) Contaminated sites discharging wastewater potentially containing PFAS, including those associated with firefighting foam, certain metal finishing wastes, or water- or stain-repellent treatment chemicals, (d) Centralized waste treatment facilities that accept any of the above wastewaters; and (e) Any other industrial users that use or have used PFAS products or raw materials.

(b) *Source monitoring.* Once sources have been identified under par. (a), the permittee shall develop a monitoring plan to sample all probable sources of PFOS and PFOA, the sampling protocol that will be followed, and the timeline for completion. The monitoring plan shall include a schedule to conduct all sampling of identified probable sources of PFOS and PFOA within the first 24 months from the date the permit was modified or revoked and reissued to include the initial PFOS and PFOA minimization plan. Any plan developed for collecting PFOS and PFOA samples from the permittee's sewer system users may be independently implemented by the permittee, jointly by the permittee and others, or by another governmental unit.

(c) *Perform source monitoring.* The permittee shall provide sample results from each probable source identified in the monitoring plan for PFOS and PFOA, using grab samples, and follow-

ing recommended sampling protocols to prevent cross-contamination.

**Note:** Permittees may refer to the Michigan Department of Environmental Quality's "Wastewater PFAS Sampling Guidance" for recommended sampling protocols and cross-contamination prevention measures. This document may be found through searching the Michigan Department of Environment, Great Lakes, and Energy website.

(d) *Actions to reduce or eliminate PFOS and PFOA in permitted discharges.* The plan shall identify PFOS and PFOA source reduction activities and measures to eliminate, reduce, or control sources to the maximum extent practicable.

**Note:** An example of an action to eliminate, reduce, or control PFAS in permitted discharges is to update sewer use ordinances.

(e) *Education and outreach.* The plan shall include activities to educate the general public, industrial and commercial sewer system users, or other professionals about the ways to reduce the use of PFAS-containing products, proper disposal of PFAS-containing products, and other mitigation efforts.

(f) *Other activities.* The plan may include activities that the department, in consultation with the permittee, determines to be appropriate for the individual permittee's circumstances.

**(3)** PRIMARY AND SECONDARY INDUSTRY PLANS. In addition to the provisions under s. NR 106.99 (1), for primary and secondary industries, a PFOS and PFOA minimization plan shall consist of an evaluation of all of the following elements:

(a) Source identification and inventory.

(b) Improvement of operational controls or maintenance.

(c) Substitution of raw materials or chemical additives with low or zero PFOS, PFOA, and PFOS and PFOA precursor alternatives.

(d) Institution of alternative processes.

(e) Clean-up of historical contamination.

(f) Other activities that the department, in consultation with the permittee, determines to be appropriate for the individual permittee's circumstances.

**(4)** REVIEWING AND APPROVING A PFOS AND PFOA MINIMIZATION PLAN. In reviewing the appropriate elements for a PFOS and PFOA minimization plan for municipal dischargers or primary and secondary industrial dischargers, the department shall consider all of the following:

(a) The type and size of discharger.

(b) The operations that generate the wastewater.

(c) The concentrations of PFOS and PFOA in the effluent, influent, and biosolids or sludge, if applicable and available.

(d) The costs of potential PFOS and PFOA minimization plan elements.

(e) The environmental costs and benefits of the PFOS and PFOA minimization plan elements.

(f) The characteristics of the community in which the discharger is located, if applicable.

(g) The opportunities for material or product substitution.

(h) The opportunities available for support from or cooperation with other organizations.

(i) The actions the discharger has taken in the past to reduce PFOS or PFOA use or discharges.

(j) Any other relevant information.

**(5)** REVISIONS TO PLANS. Any revision to previously approved plans requires department approval.

**History:** CR 21-083: cr. Register July 2022 No. 799, eff. 8-1-22.

**NR 106.995 Sampling and laboratory analysis requirements. (1)** The permittee shall collect samples in accordance with the requirements in the permit. The department may require either grab or composite samples as a permit condition. If the permittee uses a composite sampler, an equipment blank is required.

**Note:** If the permittee uses a composite sampler, it is recommended the permittee contact their department compliance representative prior to sample collection for additional sampling information.

**(2)** The laboratory performing the analyses on any samples shall be certified for the applicable PFAS compounds in the aqueous matrix by the Wisconsin Laboratory Certification Program established under s. 299.11, Stats., in accordance with s. NR 149.41.

**Note:** If the EPA Office of Water publishes a 1600 series isotope dilution method for the analysis of PFAS in wastewater, the department recommends use of the EPA method.

**(3)** The department may reject any sample results if results are produced by a laboratory that is not in compliance with certification requirements under ch. NR 149.

**History:** CR 21-083: cr. Register July 2022 No. 799, eff. 8-1-22.

**NR 106.996 New dischargers or new sources.** If the department determines that a new source or new discharger may have the reasonable potential to cause or contribute to an exceedance of the PFOS or PFOA standard under s. NR 102.04 (8) (d) 1., the permittee shall install pollution control measures to achieve the standard prior to discharge, and water quality-based effluent limitations for PFOS or PFOA or both that are calculated using the procedure in ss. NR 106.07 (2) and 106.98 (4) and ch. NR 207 shall be included in the permit.

**History:** CR 21-083: cr. Register July 2022 No. 799, eff. 8-1-22; correction made under s. 35.17, Stats., Register July 2022 No. 799.