

## REPORT TO LEGISLATURE

NR 102 and 106, Wis. Adm. Code  
Water quality standards for heat and  
associated procedures for calculation of point source effluent limitations

Board Order No. WT-36-07  
Clearinghouse Rule No. 07-111

### Basis and Purpose of the Proposed Rule

The discharge of wastewater containing pollutants is regulated by the federal Clean Water Act and Wisconsin Statutes with the purpose of preventing adverse impacts to humans, fish, and other aquatic life. For some permitted discharges, the temperature of the effluent discharged to lakes, rivers, and streams may threaten the normal function of aquatic life communities. In particular, thermal pollution may have the following effects:

- a) Redistribution and relocation of organisms by avoidance (primarily fish),
- b) Reduction of dissolved oxygen levels (due to lower gas saturation and increased bacterial decomposition of organic matter),
- c) Increased metabolism in fish and non-fish organisms which makes them more susceptible to effects of low dissolved oxygen, toxic substances, parasites, and disease,
- d) Increased algal and plant growth creating nuisance conditions and reduction in stream flow,
- e) Suppression of gamete production,
- f) Elevated rates of embryonic failure,
- g) Lethality to fish in extreme cases, and
- h) Lethality to non-mobile organisms (e.g., shellfish, aquatic insects, & some plants).

In 1974, Wisconsin developed water quality standards for heat which were approved by USEPA as required in Public Law 92-500, the "Federal Water Pollution Control Act Amendments of 1972." Those standards became effective in 1975 following the normal rule-making process. Subsequently, the Department was sued by several steam-electric power companies on the grounds that the application of the temperature standards set forth in ch. NR 102, Wis. Adm. Code, in Wisconsin Pollution Discharge Elimination System (WPDES) permits were more stringent than federal requirements and, thus, contrary to Section 283.11(2), Stats. Although other provisions in federal and state law assured that aquatic life was protected, the effect of the Wisconsin Supreme Court ruling was to severely limit the Department's ability to regulate the amount of heat discharged from power plants. Additionally, the decision has made regulation of all heated discharges to waters of the State confusing and difficult to implement consistently.

These rules have been under development for nearly 15 years. For a variety of reasons, including concerns by the regulated community about the affect of thermal standards on business operations and by the environmental community about whether the standards were protective of aquatic life, resulted in further delay after hearings on a rule package in 1998. The Department received permission to conduct public hearings on a contemporary rule package and did so in January 2008. An additional public information meeting was held in Madison on January 14, 2009 to inform interested parties of the changes made since the January 2008 public hearings. Most recently, the Department received a letter from USEPA asserting a strong desire for adoption of water quality criteria for temperature in Wisconsin noting that all of the other Region 5 states have had temperature criteria in their water quality standards for at least twenty years. USEPA went on to state that Wisconsin is the only Region 5 state that has not implemented temperature criteria uniformly across the state. Completing this rule package would allow WDNR to implement standards in a manner consistent with the federal Clean Water Act and avoid any further related objections by U.S. EPA to WPDES permits issued to dischargers of heated effluent.

The proposed rules meet U.S. EPA requirements, are responsive to many concerns of the regulated community and, most importantly, provide for the protection and propagation of aquatic life in Wisconsin's surface waters. They will allow for the orderly and consistent application of temperature effluent limitations in WPDES permits.

### Summary of Public Comments

**January 2008 Public Hearings:** Four hearings were held on the rule (Eau Claire, Green Bay, Madison, Waukesha) in January 2008. Forty-three (43) persons attended the hearings and three (3) made oral comment at the hearing. Additionally, the Department received thirty-six (36) written comments on the proposed rule.

Following the public hearings and receipt of all comments, the Department entered into discussions with U.S. EPA concerning provisions of the proposed rules that were incorporated to satisfy U.S. EPA's concerns about consistency with the federal Clean Water Act. Of primary concern to the Department was the U.S. EPA position on the use of "cap limits" – effluent limitations that were to be imposed regardless of whether or not they were needed to protect aquatic life. The "cap limit" requirement generated a significant number of adverse comments by many sectors of the regulated community.

The Department proposed an alternative approach that would achieve the same level of protection as the "cap limits" would have where it was determined to be necessary. As a result of these joint discussions, U.S. EPA agreed to the changes described below in response to the Agency's formal comments.

The primary issues raised and how the proposed rules were modified are as follows:

- **Cap Limitations** – Many comments were received by regulated dischargers that the proposed maximum temperature limitations proposed for various discharge locations were not supported by science, and were overly stringent, especially for smaller dischargers to large waterbodies.

Department Response: The "cap limits" in the proposed rule were removed. In their place, a table describing the ratio of stream flow to effluent flow ( $Q_s:Q_e$ ) has been included to specify the calculation methodologies for discharges to rivers and streams. An additional provision was added to assure aquatic life protection following U.S. EPA mixing zone guidance.

- **Limitations not necessary** – Regulated dischargers commented that there is no evidence of existing harm from heated discharges and, therefore, this rule is not necessary.

Department Response: Scientific literature is widely available that documents the adverse impacts of increased heat loads to aquatic ecosystems. While it is not common for the Department to respond to fish kills related to thermal discharges, there are a few documented cases of this phenomenon in recent years. It is more likely that the introduction of thermal discharges has changed the natural community of fish and other aquatic life that once resided in the mixing zone of a given discharge. Organisms that are less tolerant of elevated temperatures have probably been replaced by those that are more thermally tolerant. It is also likely that reproduction success has been adversely affected such that recruitment of organisms (survival to reproductive age) may be suppressed. Limited resources to monitor stream resources in recent years has not allowed the Department to focus on the collecting data to document the site-specific affects of thermal discharges in Wisconsin waters.

Regardless, U.S. EPA has objected to the issuance of permits where a heat load necessitates an evaluation of reasonable potential to exceed necessary thermal limitations. Because of the ruling of the Wisconsin Supreme Court in 1975, the Department cannot successfully include those effluent limitations when needed. If the proposed rule is not promulgated and approved by U.S. EPA in its oversight of Wisconsin's program, those objections may result in the U.S. EPA having to issue wastewater discharge permits consistent with federal regulations. This in itself is reason enough for the Department to revise the water quality standards.

- Limitations too burdensome – Dischargers commented that the costs to install cooling equipment and associated energy-related impacts were too great and exceeded any benefits of reducing heat in discharges.

Department Response: Many discharges provided no substantive cost data to support a general claim of excessive costs. Several dischargers – both industrial and municipal – suggested capital and operational costs required to install cooling. Many of those values were in response to the requirement for cap limitations and perceived inclusion of all municipal discharges. With the proposed changes made to the draft rules, the Department believes the need for cooling technology will be limited to those operations that have a reasonable potential to cause or contribute to an exceedence of the proposed water quality standards in the receiving water. Lastly, in all cases, the proposed rules provide several provisions that will allow a discharger to seek case-specific relief from limitations – either by providing more site-specific information to be used to calculate effluent limitations or by seeking alternative effluent limitations altogether.

- Discharges from Publicly Owned Treatment Works (POTWs) – The temperature of wastewater discharged from most domestic sewage treatment plants is typically between 50-55°F reflecting the temperature of the groundwater that serves as the water supply. Cooling of effluent to more closely approximate winter river temperatures would require high-cost operation of mechanical chilling equipment. As a result, POTWs have historically been exempt from meeting thermal standards. However, an exemption from meeting standards is not consistent with the Clean Water Act. The draft rule contained a variance for POTWs under certain conditions. Comments were received ranging from those that wanted an outright exemption to others who suggested that there should be no exemption or variance language specific to POTWs.

Department Response: This portion of the rule has been substantially modified from what was proposed following discussions with U.S. EPA. Although the final rule will typically not result in the establishment of temperature effluent limitations for POTWs, an individual evaluation will be made at permit issuance by Department staff as to whether heat dissipation occurs in receiving waters such that aquatic life is protected.

- Site-specific and alternative limitations – Comments were received suggesting that the burdens associated with demonstrations required for site-specific and alternative effluent limitations were too great and that there was not certainty in the outcome of the process.

Department Response: This process proposed is authorized in both the §316(a) Clean Water Act as well as s. 283.17, Wisconsin Statutes. The permitting process, including the legal and public review procedures available, assure the decisions are in conformance with state and federal law.

- Mixing zones – Comments were received suggesting that the dilution provided for mixing zones was insufficient while others suggested that the dilution available should be even less based on site-specific concerns.

Department Response: The values established are similar to values used to calculate water quality-based effluent limitations for other pollutants as described in other sections of Chapter NR 106. Provisions are made to either expand or reduce mixing zone size based on site-specific conditions.

- General Permit – Many comments suggested that “cap limitations” are unnecessary and that monitoring requirements are excessive, given the low risk of potential harm.

Department Response: The “cap limitations” have been removed as applied to general permits and the determination of limitations is referenced to procedures which are similar to other individual permits. The proposed rule authorizes the Department to establish limitations at the time general permit coverage is granted for each facility. Monitoring requirements are not

changed, but submittal of data is optional and Department staff may allow the facility to make the data available when requested.

- Rules not adequately protective of aquatic life – Comments received suggested that the proposed water quality criteria are not sufficiently stringent to protect aquatic life.

Department Response: The temperature criteria were derived using the best information and science available and are a significant advancement beyond criteria used in other states and by U.S. EPA. The Department believes the methods to calculate and establish limitations in permits are and will be protective of aquatic life and will result in increased consistency and certainty in the permitting process.

**January 2009 Public Information Meeting:** A public information meeting was held in Madison on January 14, 2009 to inform interested parties of the proposed changes made to the draft rule package in response to comments that had been received during the January 2008 public comment period. Approximately 30 non-WDNR staff attended the meeting in which a summary of the changes made was presented with an opportunity for questions afterward. In addition, feedback from interested parties was solicited on the draft rule package reflecting the changes. Written feedback was received by 12 different groups representing municipal, industrial, and environmental advocacy interests.

Some of the issues raised and how the proposed rules were modified are as follows:

- Representatives of the municipal POTW sector were concerned about the proposed change in rule language affecting their facilities on two accounts: 1) they were not aware of the shift in regulatory strategy away from the “categorical variance” and felt they had not been given time to assess the impact of the change; and 2) they believed the language was too nebulous and would raise the risk of inconsistency on how the provisions were implemented by Department staff.

Department Response: Staff worked closely with representatives of the POTW community to clarify the mechanism by which “dissipative cooling” would be assumed. Revisions to the proposed rule language included clarification on how the rule would be applied to existing dischargers versus new or those re-locating an outfall structure to a previously unimpacted water body or segment.

- Questions were raised about how the calculation of limitations for inland lake discharges did not account for dilution and instead relied only on dissipation of heat to the atmosphere.

Department Response: No change in the mixing zone formula was proposed in response to comments received because of the site-specific nature of each case. Instead, clarifications were made to s. NR 106.58 about how the results of site-specific modeling of mixing would be used in lieu of the formula based limitations in s. NR 106.55.

- Representatives of the environmental advocacy community suggested that the proposed water quality criteria in Chapter NR 102 were not protective of aquatic life.

Department Response: No changes were made to the water quality criteria as recommended by the commenters. The Department believes the criteria proposed are adequately protective of fish and aquatic life based on the literature available at the time they were developed and in recognition of the non-conservative nature of heat versus other pollutants like persistent toxic substances. The rules do provide the Department with the authority to impose more stringent effluent limitations than necessary if there are compelling reasons to do so. This would include cases where there is reason to believe the water quality criteria may not be protective of a particular fish assemblage.

- Representatives of the environmental advocacy community suggested that the eligibility criteria for dischargers of non-contact cooling water for a General Permit were not restrictive enough.

Department Response: Some of the eligibility criteria that were eliminated were related to the “cap limits” that were removed following the January 2008 public hearings. Accordingly, they are not included in the current rule package. Two provisions related to additives and public hazards due to unsafe ice conditions were reinstated in the proposed rule.

- Representatives of the pulp & paper industry questioned the use of daily maximum effluent flow values being used to establish sub-lethal limitations that were ultimately expressed in a WPDES permit as a weekly average limitation.

Department Response: Revisions were made to modify the effluent flow used to establish sub-lethal effluent limitations.

In May 2009, the Natural Resources Board adopted the proposed revisions, but was advised that U.S. EPA had contacted the Department immediately prior to the board meeting to express concern over certain provisions. U.S. EPA maintains final approval authority over state water quality standards. In response, the Department prepared revised rule language to account for those concerns. Following reconciliation of the concerns of U.S. EPA, the Department consulted representatives of both affected regulated entities (municipal sewerage treatment facilities) and environmental organizations. The proposed revisions were presented at an open meeting on September 2, 2009. In response to the comments at the public meeting as well as written feedback, the Department made additional modification to the proposal language. U.S. EPA has reviewed the changes and is in support of them. The Natural Resources Board adopted these modifications at the January 2010 Board meeting. The revisions provide clarity and specificity on the process and data needs for a POTW to request consideration of dissipative cooling. This consideration will be made using site-specific data compiled by the POTW and submitted at the time of permit application. The revisions also clearly articulate the responsibility of the Department to solicit formal comments from the public any time the Department has determined that effluent limits are unnecessary due to either dissipative cooling or because conditions have not changed from a previous permit.

#### Modifications Made

Modifications made by the Department are detailed in the response to comments above.

#### Appearances at the Public Hearing

##### **January 15, 2008 – Eau Claire**

In support – none  
In opposition – none

As interest may appear:

Michael Peters, Dairyland Power Cooperative, 3200 East Ave. S., La Crosse, WI 54602-0817

##### **January 17, 2008 – Waukesha**

In support – none  
In opposition – none

As interest may appear:

Don Bodoh, Kracor, Inc., 10414 W. Calumet Rd., Milwaukee, WI, 53224

Dana Ferguson, Alliant Energy, 4902 N. Biltmore Ln, Madison, WI 53718

Eric Klapperich, N93 W25288 Crestwood Dr., Sussex, WI 53142

Henry Probst, Precorp Enterprises, 10200 Innovation Dr., Ste. 500, Milwaukee, WI 53226

Mary Recktenwalt, Symbiont, 6737 W. Washington St., West Allis, WI 53214

### **January 25, 2008 – Madison**

In support – none

In opposition – none

As interest may appear:

Pete Jackson, US EPA, 77 W. Jackson Blvd., Chicago, IL 60604

Sean Ramach, US EPA, 77 W. Jackson Blvd., Chicago, IL 60604

Abigail Potts, Municipal Environmental Group and Wastewater Division, 1 N. Pinckney St., Ste. 200, Madison, 53703

Dana Ferguson, Alliant Energy, 4902 N. Biltmore Ln., Madison, WI 53718

Kyle Boudreaux, Point Beach – FPL Energy, 700 Universe Blvd., Juno Beach, FL, 33408

Nick George, Midwest Food Processors Association, 4600 American Pkwy, Ste. 110, Madison, WI 53718

Kathleen Standen, We Energies, 22 E. Mifflin St., Ste. 850, Madison, WI 53703

Jonathan Lefers, Montgomery Assoc., 2820 Walton Commons W., Ste. 135, Madison, WI 53718

Anna Wildeman, 1 S. Pinckney St., Ste. 700 Madison, WI, 53703

Robert C. Wendt, Applied Science, Inc., 2902 Perry St., Madison, WI 53713

Jeff Steven, Madison Metropolitan Sewerage District, 1610 Moorland Rd., Madison, WI 53713

Tom Fitzwilliams, MSA Professional Services, Inc., 1230 South Blvd., Baraboo, WI 53913

Michael Ricciardi, Madison Gas & Electric, P.O. Box 1231, Madison, WI 53701

Brad Kopetsky, 918 E. Dayton, St. Apt. 3, Madison, WI 53703

Rassa Ahmadi, 544 W. Main #307, Madison, WI 53703

Betsy Lawton, Midwest Environmental Advocates, 551 W. Main St., Madison, WI 53703

### **January 28, 2008 – Green Bay**

In support

Victoria Harris, UW Green Bay Sea Grant Institute, MAC 212, 2420 Nicolet Dr., Green Bay, WI 54311

In opposition

Ed Wilusz, Wisconsin Paper Council, 250 N. Green Bay Rd., Neenah, WI 54956

Steve Lewens, Wausau Paper, Brokaw Mill, 202 2<sup>nd</sup> St., Brokaw, WI 54417

Cara Kurtenbach, Wausau Paper, 100 Paper Pl., Mosinee, WI 54455

Kevin Fabez, Wausau Paper Speciality Products, LLC, 1100 Grand Ave, Schofield, WI 54476

As interest may appear:

Mike Sipple, Trega Foods, 2701 Freedom Rd., Little Chute, WI 54140

Jerry Donaldson, Wausau Paper, 4073 Pine Ln, Rhinelander, WI 54501

Charles Detiege, Besse Forest Product Group, 938 Rains Dr., Gladstone, MI, 49837

John Kennedy, Green Bay Metropolitan Sewerage District, P.O. Box 19015, Green Bay, WI 54307

Matt Johnson, Procter & Gamble Paper Products Company, 501 Eastman Ave., Green Bay, WI, 54302

Randy Oswald, Wisconsin Public Service Corporation, P.O. Box 19002, Green Bay, WI 54307-9002

Mark Maurer, Wisconsin Public Service Corporation, 2501 Morrison Ave., Rothschild, WI

Tom Emond, Wausau Paper, 515 W. Davenport, Rhinelander, WI 54501

Theodore Maloney, Dominion Energy Kewaunee, Inc., N490 Highway 42, Kewaunee, WI 54216

Jud White, 5000 Dominion Blvd., Glen Allen, VA 23060

Mark Metcalf, Integrys Business Support, LLC, 700 N. Adams St., Green Bay, WI 54307

Sean Ramach, US EPA, 77 W. Jackson Blvd., Chicago, IL 60604

David Pfeifer, US EPA, 77 W. Jackson Blvd., Chicago, IL 60604

Patrick Flowers, Xcel Energy, 414 Nicollett Mall (MQ-8A), Minneapolis, MN, 55401

Pete Jackson, US EPA, 77 W. Jackson Blvd., Chicago, IL 60604

Ken Graves, Georgia Pacific, 1919 S. Broadway, Green Bay, WI 54304

Jacqueline K. Powell, Georgia Pacific, 1919 S. Broadway, Green Bay, WI 54304

Melissa Mrotek, Georgia Pacific, 1919 S. Broadway, Green Bay, WI 54304

### Changes to Rule Analysis and Fiscal Estimate

The rule analysis was amended to reflect the modifications made to the rule.

Modifications were made to the Assumptions section of the Fiscal Estimate to reflect modifications made to the rule. No change in fiscal impact.

### Response to Legislative Council Rules Clearinghouse Report

The proposed rule has been significantly revised since Clearinghouse review based upon public comments. The Department considered all Clearinghouse comments and to the extent they applied to the revised rule, revisions were made.

### Final Regulatory Flexibility Analysis

The proposed rules will not have a significant economic impact on a substantial number of small businesses. The facilities affected by the proposed rules are large industrial facilities and municipal wastewater facilities.