



BUREAU OF WATER QUALITY PROGRAM GUIDANCE

WASTEWATER POLICY MANAGEMENT TEAM

Wisconsin Department of Natural Resources
101 S. Webster Street, P.O. Box 7921
Madison, WI 53707-7921

Disinfection Requirements for Discharges to Surface Waters

DRAFT: April 29, 2024

EGAD Number: 3400-2024-XX

This document is intended solely as guidance and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

APPROVED:

Adrian Stocks, Director
Bureau of Water Quality

Date

Contributors to this document:

- Laura Dietrich, WQS Variance Coordinator & Permit Drafter
- Andrew Dutcher, P.E., Plan Review Engineer
- Diane Figiel, P.E., WQBEL Engineer
- Kari Fleming, Environmental Toxicologist
- Rachel Fritz, P.E., WQBEL Engineer
- Amy Garbe, P.E., WW Compliance Engineer
- Kristi Minahan, WQS Specialist
- Phillip Spranger, Permit Drafter

Regulations

Federal Regulations:

- Sections 40 CFR 131.10 and 11 require states to develop water quality criteria to protect designated uses and require that criteria be based on federal guidance, federal guidance modified to reflect site-specific criteria, or other scientifically defensible methods.
- Sections 40 CFR 131.4 and 131.11 allow states to adopt their own water quality criteria so long as these criteria are protective of human health, enhance the quality of the water, and serve the purposes of the Clean Water Act.
- Section 40 CFR 122.44(d)(1)(vii) provides that water quality based effluent limits (WQBELs) must be derived from and comply with water quality standards and designated uses.

State Statute:

- Section 281.15, Wis. Stats., mandates that the department promulgate water quality standards, including water quality criteria and designated uses. It recognizes that different use categories and criteria are appropriate for different types of waterbodies, and that the department shall establish criteria which are not more stringent than reasonably necessary to ensure attainment of the designated use for the waterbodies in question.
- Sections 283.31(3) and (4), Wis. Stats., provide that the department may issue a permit upon the condition that the permit contains limitations necessary to assure compliance with any applicable federal law or regulation, state water quality standards, and total maximum daily loads.
- Section 283.55, Wis. Stats., grants the department authority to impose monitoring and reporting requirements.

State Administrative Code:

- Section NR 102.04(5)(a) Wis. Adm. Code, specifies that all surface waters shall be suitable for supporting recreational use and shall meet the criteria specified in sub. (6).
- Section NR 102.04(5)(b) Wis. Adm. Code, states that whenever the department determines, in accordance with the procedures specified in s. NR 210.06(3), Wis. Adm. Code, that wastewater disinfection is not required to protect recreational uses, the criteria specified in par. (a) and in chs. NR 103 and 104, Wis. Adm. Code, do not apply.
- Section NR 102.04(6)(a) Wis. Adm. Code, contains the state's surface water quality criteria for *Escherichia coli* (*E. coli*), to protect humans from illness caused by fecal contamination due to recreational contact with surface water.
- Section NR 210.06(1) Wis. Adm. Code, specifies that disinfection shall be required of publicly and privately owned sewage treatment works when the department determines that the discharge poses a risk to human and animal health. Disinfection shall be required:

- (a) From May 1 through September 30 annually to protect recreational uses, or
- (b) Year-round to protect public drinking water supplies.
- (c) The period during which disinfection under pars. (a) and (b) is required may be adjusted in a WPDES permit where necessary to protect human and animal health.
- Section NR 210.06(2) Wis. Adm. Code, specifies effluent limitations necessary during the disinfection period to protect the recreational use and those necessary to protect a public drinking water supply outside of the recreation period.
- Section NR 210.06(3) Wis. Adm. Code, specifies that publicly and privately owned sewage treatment works must provide information that the department will use to determine the need for effluent disinfection with their permit application. The following information shall be used in identifying risks to human and animal health:
 - (a) Proximity of the wastewater outfall to swimming beaches and other waters which have a high level of human contact recreational activities.
 - (b) Proximity of the wastewater outfall to public drinking water supply intakes. At a minimum, whenever a drinking water intake is within a radius of 5 miles of a wastewater outfall in a lake or impoundment or within 20 miles downstream of a wastewater outfall on a flowing surface water, disinfection shall be provided.
 - (c) Proximity of the wastewater outfall to wetlands which support populations of waterfowl subject to disease outbreaks, which may be caused by the discharge of wastewater which has not been disinfected.
 - (d) Quality of the wastewater being discharged.
 - (e) Dilution and mixing characteristics of the wastewater with the receiving water.
 - (f) Bacterial indicator organism levels or sanitary survey results from sampling conducted in the vicinity of the wastewater outfall and near the sites used for recreational purposes.
 - (g) The classification of the receiving water and downstream waters as determined in s. NR 104.02 (1).
 - (h) The detention time of the wastewater treatment system. Except in extenuating circumstances, the discharge of wastewater to surface water from a treatment system with a detention time of 180 days or longer does not pose a risk to human and animal health.
 - (i) Other factors that are necessary to determine if there is a risk posed to human and animal health by the discharge of wastewater that has not been disinfected.

Introduction

The Clean Water Act requires states to adopt water quality standards (WQS) to protect recreation in and on the water. Wisconsin's WQS include a recreation designated use (s. NR 102.04(5)(a), Wis. Adm. Code) and *Escherichia coli* (*E. coli*) water quality criteria (WQC) to protect this use (s. NR 102.04(6)(a), Wis. Adm. Code).

Revisions to Wisconsin's bacteria WQC to protect recreational uses and related implementation procedures took effect May 1, 2020. These revisions changed the bacteria WQC from fecal coliform to *E. coli* in ch. NR 102, Wis. Adm. Code, for protection of recreational uses. These revisions also changed permit requirements for publicly and privately owned sewage treatment works in ch. NR 210, Wis. Adm. Code, and updated analytical methods for bacteria in ch. NR 219, Wis. Adm. Code. Starting on May 1, 2020, fecal coliform WQC are no longer applicable during the recreation season and are replaced with *E. coli* WQC consistent with state law. Implementation of the new *E. coli* WQC is discussed in the ["Implementation of Bacteria Water Quality Standards in Wastewater Permits"](#) guidance document. These updates to the bacteria WQS and related implementation guidance also prompted the department to review its implementation of

disinfection requirements intended to further implement the WQS and protect recreational uses.

Section NR 210.06(1), Wis. Adm. Code, specifies that disinfection shall be required of publicly and privately owned sewage treatment works from May 1 through September 30 to protect recreational uses, or year-round if necessary to protect public drinking water supplies. The Department may adjust the period during which disinfection is required in a WPDES permit where necessary to protect human or animal health. Section NR 102.04(5)(b), Wis. Adm. Code, states that exceptions to the disinfection requirement can be made whenever the Department determines, in accordance with the procedures specified in s. NR 210.06(3), Wis. Adm. Code, that wastewater disinfection is not required to meet water quality criteria and protect the recreational use. This document provides guidance related to how and when disinfection-related decisions should be made by Department staff.

This guidance is not intended to apply to groundwater discharges due to disappearing streams. If these discharges need to meet surface WQC, then this guidance should be considered when determining whether and when disinfection is needed. However, guidance related to the protection of groundwater in these situations is being addressed in another document *(link to be added when GW guidance is complete)*.

Recreational Use Designation

Section NR 102.04 (5)(a), Wis. Adm. Code, specifies that all surface waters shall be suitable for supporting recreational use. Some recreational activities may have more potential for ingestion or immersion than others, but it is important to recognize that Wisconsin's designated use is not tiered for different activities and does not differentiate between recreation types. Activities that should be considered recreational activities are those where people have the potential for full or partial body contact. Examples of these activities include: swimming, diving, water skiing, jet skiing, canoeing, kayaking, tubing, water play by children, or similar activities where immersion or ingestion may occur.

Permittees cannot be exempted from disinfection because no one is thought to be recreating in the waterbody that they discharge into. This would amount to the removal of the recreational use designation. In order to remove a recreational use designation, or to revise it such that it would require less-stringent water quality criteria, a Use Attainability Analysis (UAA) is required by federal law. A UAA involves considering specific factors described in EPA's WQS regulation (40 CFR 131.10(g)) related to physical, chemical, and biological characteristics of the waterbody, as well as economic factors impacting the use's attainability. A recreational use can only be removed or revised to a lower use if the recreational use is neither "existing" nor "attainable". Per EPA's definition of "existing uses", a recreational use is existing if recreation has occurred at any time since 1975. If recreation is not currently or historically existing, the use cannot be removed/revise unless it is also not attainable; i.e., the factors causing the nonattainment are natural or uncontrollable. If the Department determines that a UAA is justifiable, the UAA would have to be approved by DNR and EPA, public hearings would be required, and a rule revision would be needed to revise the use designation. If staff or others feel that a UAA is appropriate, they should consult with DNR's water quality standards staff in the Water Evaluation Section. See EPA's website for more information: <https://www.epa.gov/wqs-tech/use-attainability-analysis-uaa>.

Wastewater Disinfection Considerations

Section NR 210.06(1), Wis. Adm. Code, sets the default time frames which serve as the starting point for disinfection decisions. It states that unless otherwise determined by the Department, facilities shall disinfect May 1 through September 30 annually to support recreational use or year-round to protect public drinking water supplies. Associated effluent limitations are established in s. NR 210.06(2), Wis. Adm. Code.

Section NR 102.04(5), Wis. Adm. Code, says that all surface waters shall be suitable for supporting recreational use and shall meet *E. coli* criteria during the recreation season. Section NR 102.04(5)(b), Wis. Adm. Code, allows the Department to make exceptions when it determines, in accordance with s. NR 210.06(3), Wis. Adm. Code, that wastewater disinfection is not required to protect the recreational use. Section NR 210.06(3), Wis. Adm. Code, tasks the Department with determining the need for disinfection using a site-specific analysis based on potential risk to human or animal health. It sets out the factors that must be considered in determining the necessity to disinfect municipal wastewater or to change the length of the disinfection season.

This guidance contains a bulleted list that includes the factors in s. NR 210.06(3), Wis. Adm. Code, that the permittee is required to identify in their permit application and that the Department must use to determine the need for effluent disinfection. The list is shown in the order provided in administrative code and does not indicate that one factor is more important than another. This information is to be used to identify risks to human and/or animal health. Beneath each factor, a discussion is provided regarding how that information may be used to make disinfection-related decisions for individual permittees. Information related to each factor should be considered collectively, using information that is available and applicable to the facility being evaluated. Decisions related to the need for disinfection should be made by water quality-based effluent limit (WQBEL) calculators, with input from compliance staff and permit drafters, during the permit reissuance process.

It is important that disinfection-related decisions be well documented in WQBEL memos and permit fact sheets. Decisions regarding the need for disinfection should be clearly explained in WQBEL memos, so that others can understand why decisions were made. Permit fact sheets should refer to specific language in the WQBEL memo or include additional explanations of disinfection-related permit decisions, as needed.

(a) Proximity of the wastewater outfall to swimming beaches and other waters which have a high level of human contact recreational activities.

The presence of “human contact recreational activities” in areas potentially impacted by the discharge is an important factor when considering the risk of illness from wastewater that has not been disinfected prior to discharge. Since s. NR 102.04 (5)(a), Wis. Adm. Code, specifies that all surface waters shall be suitable for supporting recreational use, the presence or absence of actual recreational activities in close proximity to the outfall would not be a reason to exempt a facility from disinfection. This factor may be considered to assess the need for an extension of the disinfection season in situations where the Department has information clearly showing that recreational activities are occurring outside of the default season.

In most cases, the Department is not likely to have information on hand regarding the location and timing of most recreational activities and therefore will have to rely on information submitted by the public, local government, permittee, or others as to when recreational activities are occurring. If

information related to areas in which recreational activities are occurring is available, staff must consider this information when making decisions about disinfection requirements, as required by s. NR 210.06(1)(a), Wis. Adm. Code.

If the Department is given information which clearly shows that “a high level of human contact recreational activities” are regularly occurring in close proximity to the outfall in periods of the year outside of the default season, then the disinfection period should be adjusted accordingly. For example, if a map shows that there is a swimming beach just downstream of the outfall and that beach is open before May or after September, then the disinfection season should be set to protect the periods in which that beach is open for business.

For the purpose of this evaluation, it is recommended that recreational activities occurring within a radius of 5 miles of a wastewater outfall in a nonflowing waterbody or within 20 miles downstream of an outfall on a flowing surface water be considered in close proximity in most cases. *E. coli* survival rates in surface waters are dependent on water quality parameters such as temperature, UV exposure, and time (for more information, see bibliography at the end of this document). *E. coli* sampling results provided to the Department suggest that *E. coli* can be present 20 miles downstream of an outfall, when domestic sewage that has not been disinfected is discharged into a flowing stream (Friends of Badfish Creek, Project #RP34020, Badfish Creek/Lower Yahara River Microbial Source Tracking, 2/15/2020-12/31/2021).

Temperature, UV exposure, and other receiving water characteristics can vary based on an outfall’s location. If a permittee or other stakeholder wishes to demonstrate that a different distance is appropriate for determining close proximity in a specific case, they should submit the results of recreational use surveys, receiving water sampling studies (showing temperature, UV exposure, *E. coli*, and/or other appropriate parameters), and any other relevant information to the Department to demonstrate that a different distance is appropriate in the discharge area.

If there is information that shows that recreational activities occur within this radius outside of the default recreation season, then the disinfection period should be extended as necessary to protect the recreational use. Since the purpose of the extension would be to protect the recreational use, the discharge would need to meet the *E. coli* effluent limitations in s. NR 210.06(2), Wis. Adm. Code, during the extended recreation season.

As noted in the section related to Use Attainability Analysis, Wis. Adm. Code specifies that all surface waters are designated as recreational use, so permittees cannot be exempted from disinfection because no one is thought to be recreating in the receiving waterbody.

- (b) Proximity of the wastewater outfall to public drinking water supply intakes. At a minimum, whenever a drinking water intake is within a radius of 5 miles of a wastewater outfall in a lake or impoundment or within 20 miles downstream of a wastewater outfall on a flowing surface water, disinfection shall be provided.**

Section NR 210.06(1)(b), Wis. Adm. Code, specifies that disinfection shall be required year-round to protect public drinking water supplies. At a minimum, this is required for discharge locations proximal to drinking water intakes as specified in (b) above. The effluent limitations that are

required to implement bacteria WQC are discussed in the [“Implementation of Bacteria Water Quality Standards in Wastewater Permits”](#) guidance document.

If there is site-specific information that suggests the need for protection of a drinking water supply that is further than 5 or 20 miles away (depending on waterbody type), this information may also justify a requirement for year-round disinfection. For example, site-specific information might include receiving water data showing that the bacteria WQC is exceeded in the area around the drinking water intake and source tracking data that shows that the bacteria are from human waste.

Note: Sections of NR 104, Wis. Adm. Code, list waterbodies for which public water supply standards shall be met. However, Section NR 210.06(3), Wis. Adm. Code, applies only to areas where an outfall is within proximity of a drinking water intake. Therefore, year-round disinfection to protect a drinking water supply should be required only in those areas where a drinking water intake is known to be present and not solely because the waterbody is listed in ch. NR 104, Wis. Adm. Code.

(c) Proximity of the wastewater outfall to wetlands which support populations of waterfowl subject to disease outbreaks, which may be caused by the discharge of wastewater which has not been disinfected.

Disinfection or other mitigation (such as longer detention times or seasonal discharge restrictions) may be necessary if a significant disease risk to wild waterfowl or other wild species associated with stream habitats is identified. For instance, if information suggests that the wastewater discharge contains disease that is easily transmitted to wild animals then the Department could consider requirements to protect wildlife.

(d) Quality of the wastewater being discharged.

If effluent monitoring shows that a facility can meet bacteria limits during the recreation season without disinfection, then disinfection does not have to be required in the permit. In these cases, water quality standards are being attained without disinfection. Factor (h) suggests that treatment facilities with detention times of 180 days or more are expected to meet limits without disinfection and therefore qualify for a disinfection exception. Factor (d) may allow other facilities with holding times less than 180 days to also make such a demonstration through effluent monitoring.

A facility that discharges low concentrations of bacteria, for instance because their sewage is always diluted with other water that does not contain bacteria (e.g., industrial contributions), may also be able to show that they can meet bacteria limits without disinfection. Dilution from inflow and infiltration does not satisfy this requirement. Staff should consider whether other conditions are present that might allow a permittee to demonstrate that compliance can be achieved without disinfection.

E. coli monitoring should be included in permits in these situations in order to ensure that the recreational use is being protected (WQC are being met) without disinfection. Monitoring should be conducted at a minimum of 1x weekly for one disinfection season in each permit term, to show whether limits can be met without disinfection. Decisions regarding the need for disinfection should be reevaluated if factors such as industrial flow volume or detention times change.

(e) Dilution and mixing characteristics of the wastewater with the receiving water.

Human waste contains a variety of pathogens that can be spread through water and cause a wide range of diseases. Wisconsin's bacteria WQC employ the pathogen indicator concept in which the indicator itself (*E. coli*) does not cause disease, but instead signals the potential for illness caused by the presence of human fecal contamination. As the concentration of *E. coli* goes up, so does the risk of illness in humans caused by pathogens in the wastewater that has not been disinfected.

Since the risk of illness is related to the concentration of *E. coli*, the amount of dilution and mixing available in the receiving water into which the effluent is discharged is an important factor. A receiving water that provides a lot of dilution and rapid mixing at the point where the WQC must be met (where the outfall meets the receiving water or at some downstream location) would create less risk than a situation where there was little dilution or mixing of the effluent in the receiving water. Although *E. coli* and pathogens do not necessarily behave as conservative pollutants since the population can experience growth and/or die-off, dilution contributes to the ability to meet recreational WQC in the receiving water. Situations where the effluent flow (annual average design flow) to receiving water flow ($Q_{7,10}$) ratio is $\geq 1 : 1,000$ should provide enough dilution and rapid mixing so that disinfection would not be necessary to protect the recreational use, therefore disinfection and *E. coli* effluent limits may not be necessary when these conditions exist.

In most cases, the mixing and dilution available at the point where the outfall meets the receiving water should be considered. However, it may be appropriate to consider the available dilution and mixing at a downstream location if the area within the discharge's mixing zone cannot physically or legally be used for recreation. Some examples that might fall into this category would be a discharge into a dam structure (or into a restricted area around a dam) or to a wastewater effluent channel that can be demonstrated to be gaining groundwater under all conditions (such that enough mixing occurs to meet WQC at the end of the channel). See factor (g) for more discussion of effluent channels.

(f) Bacterial indicator organism levels or sanitary survey results from sampling conducted in the vicinity of the wastewater outfall and near the sites used for recreational purposes.

As noted above in the section related to use attainability analysis, Wis. Adm. Code specifies that all surface waters are designated as recreational use, so permittees cannot be exempted from disinfection because no one is thought to be recreating in the receiving waterbody.

Results of sanitary surveys that document the presence of recreational activity may be used to justify the need for a change to the length of the default recreation season (May 1 through September 30). As described above under (a), the presence of recreational activities in close proximity to a wastewater discharge could be reason to extend the recreation season, if activities occur outside of the default season.

(g) The classification of the receiving water and downstream waters as determined in s. NR 104.02(1).

Section NR 210.06(3)(g), Wis. Adm. Code, states that disinfection decisions may be made based on the hydrologic classifications listed in NR 104.02(1), Wis. Adm. Code (**not** on the water quality classifications - i.e., limited forage fish, limited aquatic life - that are defined in s. NR 104.02(3), Wis.

Adm. Code). The following bulleted items are taken directly from s. NR 104.02(1), Wis. Adm. Code, which defines hydrologic classifications for surface waters.

- **Lakes or flowages.** This classification includes bodies of water whose current is more or less stagnant or which lacks a unidirectional current.

Since lakes and flowages have a higher likelihood of providing full contact recreational activities, disinfection should not be exempted based solely on this hydrological classification.

- **Diffused surface waters.** This classification includes any water from rains, intermittent springs or melting snow which flows on the land surface, through ravines, etc., which are usually dry except in times of runoff. This category does not include waters at the land surface in the vicinity of agricultural or wastewater irrigation disposal systems.

Discharges to diffuse surface waters that have very little to no flow most often result in effluent-dominated situations. As noted above, the risk of illness is related to the concentration of *E. coli* and therefore dilution is an important consideration when considering risk to human health. Since little to no dilution is present in these situations, disinfection should not be exempted based solely on this hydrological classification.

- **Wetlands.** This classification includes areas where water is at, near, or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and which have soils indicative of wet conditions.

Wetlands are surface waters of the state, are therefore designated as recreational use and disinfection should not be exempted based solely on this hydrological classification.

- **Wastewater effluent channels.** This classification includes discharge conveyances constructed primarily for the purpose of transporting wastes from a facility to a point of discharge. Drainage ditches (including those established under ch. 88, Stats.) constructed primarily for the purposes of relieving excess waters on agricultural lands shall not be construed as effluent channels. Modifications made to natural watercourses receiving wastewater effluents for the purpose of increasing or enhancing the natural flow characteristics of the stream shall not be classified as effluent channels. NR 102 does not include effluent channels.

Effluent channels are considered to be part of the wastewater treatment system (i.e., essentially an extension of the outfall pipe), therefore *E. coli* WQC and the recreational use (and disinfection requirements) would apply at the end of the effluent channel. In order to be considered an effluent channel, the permittee must be able to provide information that shows that the discharge conveyance was constructed primarily for the purpose of transporting wastewater from the facility. Modifications made to previously existing natural watercourses cannot be considered effluent channels.

In situations where the effluent channel is not contained entirely within a fence around the WWTP property (or another physical structure that prevents public access), it is recommended that signs be posted and maintained at intervals of 100 feet to inform the public that treated (but not disinfected) effluent is being discharged to the effluent channel.

- **Noncontinuous streams.** This classification includes watercourses which have a defined stream channel, but have a natural 7-day Q flow of less than 0.1 cfs and do not exhibit characteristics of being perpetually wet without wastewater discharges.

Discharges to noncontinuous streams with $Q_{7,10}$ values < 0.1 cfs usually result in effluent-dominated situations. As noted above, the risk of illness is related to the concentration of *E. coli* and therefore dilution is an important consideration when considering risk to human health. Since little to no dilution is present in these situations, disinfection should not be exempted based solely on this hydrological classification.

- **Continuous streams.** This classification includes watercourses which have a natural 7-day Q flow of greater than 0.1 cfs or which exhibit characteristics of a perpetually wet environment, are generally capable of supporting a diverse aquatic biota and flow in a defined stream channel.

Continuous streams have a higher likelihood of providing opportunities for full contact recreational activities. Disinfection should not be exempted based solely on this hydrological classification.

- (h) The detention time of the wastewater treatment system. Except in extenuating circumstances, the discharge of wastewater to surface water from a treatment system with a detention time of 180 days or longer does not pose a risk to human and animal health.**

The Department has historically granted disinfection exceptions to facilities that have a detention time of at least 180 days and that have been determined to be able to meet bacteria limits without disinfection. Department staff analyzed existing effluent data in 2016 from facilities that have $\geq 180d$ detention in order to confirm whether or not these exceptions were appropriate. This evaluation showed that effluent limits are being met in these situations without disinfection.

At each permit reissuance, Department staff should evaluate the last permit term's worth of flow data as a rolling 180 day average to determine whether the $\geq 180d$ detention time was provided at all times during the permit term ($Detention\ Time\ [days] = \frac{Total\ Pond\ Volume\ [MG]}{180-d\ average\ flow\ rate\ [mgd]}$). The average of the influent and effluent flow rate values should be used if the metered values differ by more than 5 percent unless one meter is known to be less reliable. If the data shows that the facility provides $\geq 180d$ detention time, then disinfection would not be required. Effluent limits and monitoring are not needed in the permit if $\geq 180d$ detention time is provided.

As discussed in (d) above, if a facility has a detention time $< 180d$, but effluent data is provided that shows the equivalent of disinfection is maintained through operation of WWTP processes without addition of chemical disinfectants or UV light, then a disinfection exception may be appropriate. (The equivalent of disinfection means that effluent *E. coli* does not exceed a monthly geometric mean of 126 counts/100 mL and no more than 10% of samples in a calendar month exceed 410 counts/100 mL.) Effluent monitoring should be included in the permit to ensure that the recreational use is being protected without disinfection in these cases. Monitoring should be conducted at a minimum of 1x weekly for one disinfection season in each permit term, to show whether limits can be met without disinfection.

- (i) **Other factors that are necessary to determine if there is a risk posed to human and animal health by the discharge of wastewater that has not been disinfected.**

There may be other site-specific information not described in this guidance that could be considered when making decisions regarding when disinfection is needed to protect the recreational use. For example, the use of wastewater for certain industrial or irrigation purposes (e.g., food processing, composting, golf courses, food crops, etc.) might cause a need for disinfection or for an extended disinfection period, if necessary to protect the recreational use.

Section NR 210.06(3), Wis. Adm. Code, states that the permittee must identify the information needed to make decisions about disinfection requirements in their permit application, so that the Department can consider it when making decisions during the permit reissuance process. If permittees believe that there is site-specific information that the Department should consider when making disinfection-related decisions, they should submit that information with their permit application.

Compliance Schedules

Permittees with existing discharges that are required to disinfect for the first time may be given a compliance schedule that allows time for the permittee to comply with new limitations. Schedules may allow time to investigate options for meeting their limits but must require them to come into compliance with those limits as soon as possible (s. NR 106.117(3), Wis. Adm. Code), and may not be longer than 5 years. Such action items included would be development of a Facility Plan (s. NR 110.08, Wis. Adm. Code), plans and specifications (ss. NR 110.06 & 110.07, Wis. Adm. Code), and construction. Final action items and due dates will be site specific; however, guidance and example compliance schedule language is described in the guidance titled, "[Implementation of Bacteria Water Quality Standards in Wastewater Permits](#)".

Clean Water Fund Loans & Principal Forgiveness

The Clean Water Fund Program (CWFP) provides financial assistance to municipalities for wastewater infrastructure projects. Projects for compliance with a municipality's WPDES permit are eligible for the program. Information about the CWFP including eligibility, how to apply, deadlines, and other information can be found online at: <https://dnr.wisconsin.gov/aid/EIF.html>.

Principal Forgiveness (PF) is an additional subsidy to assist municipalities that would experience significant hardship raising the revenue needed for infrastructure projects. PF is used to reduce the size of a loan, thus reducing annual principal and interest payments. Additional information about PF can be found online at: <https://dnr.wisconsin.gov/aid/documents/EIF/Guide/PF.html>.

The Bipartisan Infrastructure Law (BIL), also known as the Infrastructure Investment and Jobs Act (IIJA) of 2021, will provide over \$700 million in *additional* funding during the next five years through the Wisconsin Department of Natural Resources (DNR) Environmental Loans programs (Clean Water Fund and Safe Drinking Water Loan Programs). Additional information about BIL can be found online at: <https://dnr.wisconsin.gov/topic/aid/BilFunding.html>.

Bibliography

Blaustein et al., *Escherichia coli Survival in Waters: Temperature Dependence*, 2013, *Water Research* 47, 569-578.

Boehm, et al., *Can We Swim Yet? Systematic Review, Meta-Analysis, and Risk Assessment of Aging Sewage in Surface Waters*, *Environmental Science & Technology*, 2018, 52, 9634-9645.

Chahal, et al., *Pathogen and Particle Associations in Wastewater: Significance and Implications for Treatment and Disinfection Processes*, 2016, *Advances in Applied Microbiology*, Volume 97.

Murphy, et al. *Persistence of Pathogens in Sewage and Other Water Types*, 2017, Global Water Pathogen Project. (M. Yates (eds) Part 4 Management of Risk from Excreta and Wastewater), Michigan State University, E. Lansing, MI, UNESCO.

Naidoo, et al., *Treated Wastewater Effluent as a Source of Microbial Pollution of Surface Water Resources*, *International Journal of Environmental Research and Public Health*, 2014, 11, 249-270.

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