DRAFT 4/22/26

The statement of scope for this rule, SS 103-24, was approved by the Governor on September 12, 2024, published in Register No. 826A3 on October 21, 2024, and approved by the Natural Resources Board on February 26, 2025. This rule was approved by the Governor on insert date.

ORDER OF THE STATE OF WISCONSIN NATURAL RESOURCES BOARD

REPEALING, RENUMBERING, RENUMBERING AND AMENDING, AMENDING, REPEALING AND RECREATING AND CREATING RULES

The Wisconsin Natural Resources Board proposes an order to **repeal** NR 110.05, 110.07 (3), 110.09 (2) (j) 2m. (title), 3. (title), and 4. (title), 110.15 (5) (f), 110.25 (intro.), and 110.27; to **renumber** NR 110.23 (3); to **renumber and amend** NR 110.03 (1), 110.12, and 110.22 (4) (b) 2.; to **amend** NR 108.02 (13) (c) and (d) and (14), 110.01, 110.03 (4), (4) (Note), (6), (6) (Note), and (27), 110.06 (1), 110.08 (1), (2), and (4), 110.09 (1) (b) 5., 10., and 11., (2) (e) 1. to 4., (f), (j) 1., 2., 3. b., and 4. c., and (p) to (r), (3) (c) and (f) (intro.) and 1. to 5., (4), (7) (title), (intro.), (a), (b) (intro.) and 1. to 6., and (c) 1. and 2., and (8) (title), (a), (b) (Note) and 2. (intro.), and (c) (intro.), 1., and 4., 110.10 (1) (f), (g), and (L) and (2) (a), 110.12 (title), 110.13 (1) (b) 2., (d) 2., and 3., (2) (b), (d) 1. and 2., (i) 1. and 2., and (k) 1., (3) (c), (d), (e), and (g), and (5) (e), (f) (intro.), 1. to 3., and 5., (g), and (h) (intro.), 1., and 3., 110.14 (3) (b) 7., (c) 1., (e), (g) 1., and (j) 1., 3., 4., and 4. (Note), 110.15 (1), (3) (title), (a) 5., (d) 1. (intro.), and (e), (4) (b) 2. and (d), and (5) (e), (j), and (q) 3. (intro.) and 4., 110.16 (1) (a) and (c) and (2) (b) 1., 110.17 (1) and (3) (c) 2., 110.18 (1) (a) 1. and (2) (b), (c) 7., and (d) 2., 110.19 (1) (a) and (b), 110.20 (3) (c), 110.21 (3) (b) and (e), (4) (a), Table 5, and (d) 2., (5) (c) and (d), (6) (a) 1. and (c), and (7) Table 6, (b) 1., and (e), 110.22 (2), (3) (c) 1. and 3., (4) (a) 1., 2., and 3. and (c) 4., (5) (b) 1., and (7) (f) 3., 110.23 (1) (a) 2. and (2) (g) 1., 110.24 (2) (a) 3., (b) 1., and (d) 3. and (4) (b) 1. and 2. and (d) 1., 4., and 5., 110.25 (title), (1), (3), (3m), (4) (a) 3., (c) 1. and 2., and (e) to (g), and (5) (a) (Note), (b) 1. to 3., and (c) (intro.) and 1. a. and b., 110.255 (title), (1) (a) 1., 9., and 10. c., (2) (a) 1., and (3) (a) 2. and 15., 110.26 (2) (e) 1. and 2., (3) (b), (5) (a) 2., (b) 1. a. and b., (c), and (d) 3. and 6., (6) (b) 1. and (c) 2., (7) (c), (8) (c) 1. and 2., (10) (a) and (b) 1., and (11) (a) 1.; to **repeal and recreate** NR 110.15 (5) (c), 110.24 Table 7, and 110.26 (6) (c) 1.; and to **create** NR 108.04 (2) (c) 2. (Note), 110.03 (1g), (1g) (Note), (13d), (20), (20) (Note), (22m), (22m) (Note), (24), (27) (Note), (27w), (27w) (Note), and (29) (Note), 110.08 (4) (Note), 110.09 (1) (b) 12., 12. (Note), and 13., (2) (e) 6., (2) (s), (5) (e), (9), and (10), 110.10 (1m), 110.11 (1m), 110.12 (2), (2) (Note), (3), and (3) (Note), 110.13 (intro.) and (2) (i) 3., 110.14 (intro.) and (3) (c) 6. c. and (j) 1. (Note), 110.15 (intro.), (3) (d) 1. (Note) and 2. (Note), and (5) (q) 7. and 7. (Note), 110.16 (intro.) and (2) (d), 110.17 (intro.) and (3) (e), 110.18 (intro.), 110.19 (intro.), 110.20 (intro.), 110.21 (intro.), Table 5 table notes a to f, and (8) to (10), 110.22 (intro.), (4) (a) 1m., 1m. (Note), and 6. and (b) 2. a. to f., and (8), 110.23 (intro.) and (3) (a) (title) and (b) to (h), 110.24 (intro.), 110.25 (1) (Note), 110.255 (5) to (7), 110.26 (2) (f), (3) (cm), (4) (b) 6., (5) (g), (6) (c) 4. and (f), (7) (c) (Note), (10) (a) (Note), (d) 5. and 5. (Note), and (h), and 110.28 relating to approval requirements for sewerage projects and facilities.

WY-09-24
Approval requirements for sewerage projects and facilities

Analysis Prepared by the Department of Natural Resources

1. Statute Interpreted:

Sections 227.11(2)(a), 281.12, 281.41, 281.58(9), 283.83, 283.85, and 283.93, Stats.

2. Statutory Authority:

Sections 227.11(2)(a), 281.12, 281.41, 281.58(9), 283.83, 283.85, and 283.93, Stats.

3. Explanation of Agency Authority:

Section 227.11(2)(a), Stats., provides that a state agency "may promulgate rules interpreting the provisions of any statute enforced or administered by the agency, if the agency considers it necessary to effectuate the purpose of the statute," subject to certain restrictions.

Section 281.12, Stats., contains general powers and duties for the department concerning waters of the state. In particular, s. 281.12(3), Stats., states that the department "upon request, shall consult with and advise owners who have installed or are about to install systems or plants, as to the most appropriate water source and the best method of providing for its purity, or as to the best method of disposing of wastewater, including operations and maintenance, taking into consideration the future needs of the community for protection of its water supply."

Section 281.41, Stats., contains requirements for department review and approval of sewerage facilities, but this statute also allows certain types of systems to be exempted by rule.

Section 281.58(9), Stats., requires department plan review of projects submitted to the Clean Water Fund Program for financial assistance.

Sections 283.83, 283.85, and 283.93, Stats., contain requirements for the department's continuing planning process, design of publicly owned treatment facilities, and limited exemptions from governmental consideration of environmental impact, respectively.

4. Related Statutes or Rules:

No other related statutes or rules are in progress.

5. Plain Language Analysis:

The Department of Natural Resources (department) is proposing an update of code requirements and procedures for the planning and design of sewerage (sewage/wastewater) systems. The primary goals of revisions to chs. NR 108 and 110, Wis. Adm. Code, are to codify existing regulatory review practices and broadly accepted engineering design standards, remove code requirements that may be conflicting or are no longer applicable, address grammatical or citation errors and inconsistencies, and otherwise improve clarity and ease of use for owners and design engineers of sewerage systems.

6. Summary of, and Comparison with, Existing or Proposed Federal Statutes and Regulations:

States develop their own technical design standards for sewerage systems, as there are no federally equivalent design regulations. The U.S. Environmental Protection Agency (EPA) approves the department's sewerage system plan review program as part of their program delegation agreement with the department in accordance with Title 40, Code of Federal Regulations Section 122.

The section of ch. NR 110 dealing with areawide water quality management plans is in conformance with Title 40, Code of Federal Regulations Section 130.5, which requires a continuing planning process for those plans.

7. If Held, Summary of Comments Received During Preliminary Comment Period and at Public Hearing on the Statement of Scope:

The department held a virtual preliminary public hearing on the statement of scope on December 19, 2024, and two members of the public attended the hearing. No attendees registered in support of or in opposition to the scope statement; rather, the two attendees stated they were attending the hearing for information only. No public testimony was received during the hearing.

The public comment period on the scope statement ended on December 19, 2024. The department received one written comment on the proposed statement of scope. The comments were on behalf of the Municipal Environmental Group (MEG), which represents municipal wastewater facilities, and indicated their support. MEG also requested a seat on the technical advisory committee to inform decision-making during rule drafting.

8. Comparison with Similar Rules in Adjacent States:

Adjacent states (Illinois, Iowa, Michigan, and Minnesota) each have rules for sewerage systems that require state regulatory review and approval of proposed new or modified sewerage systems, and that contain design standards for sewerage systems. These rules are available below:

- Illinois: Illinois Adm. Code, Title 35, Part 370 (Illinois Recommended Standards for Sewage Works).
- Iowa: Iowa Wastewater Facilities Design Standards (IWFDW).
- Michigan: Michigan Adm. Code, Sections R. 299.2901 to 299.2974 (Environmental Quality, Water Resource Division Sewerage Systems – Sewerage Systems).
- Minnesota: Minnesota Administrative Rules, Chapter 7077, Wastewater and Storm Water Treatment Assistance.

The four states surrounding Wisconsin – Illinois, Michigan, Iowa, and Minnesota – are members of the committee that develops the "Ten State Standards for Wastewater Facilities" (see item 9) and each uses those standards as the basis for regulatory requirements for municipal wastewater systems in their respective states. Wisconsin's revisions are in general alignment with the "Ten States Standards for Wastewater Facilities," and are similar to the rules of the

surrounding states.

9. Summary of Factual Data and Analytical Methodologies Used and How Any Related Findings Support the Regulatory Approach Chosen:

The proposed rule updates were informed by two primary sources:

- The recently revised "Ten States Standards for Wastewater Facilities" (formally the "Recommended Standards for Wastewater Facilities: Policies for the Design, Review, and Approval of Plans and Specifications for Wastewater Collection and Treatment Facilities," 2026 Edition, a Report of the Wastewater Committee of the Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers). The Ten States Standards for Wastewater Facilities is a set of technical standards for planning and design of municipal wastewater systems in the Great Lakes region, which includes Iowa, Illinois, Michigan, Minnesota, and Wisconsin. The Ten States Standards are available to view free of charge at: https://www.health.state.mn.us/communities/environment/water/tenstates/index.html.
- Six technical advisory committee meetings, which were comprised of stakeholders from various municipal wastewater systems, consulting engineering firms, and regional planning commissions, were held throughout 2025 to solicit input on code revisions.

10. Analysis and Supporting Documents Used to Determine the Effect on Small Business or in Preparation of an Economic Impact Report:

Not applicable. The rule language is intended to address and clarify engineering design standards for treatment and sewerage systems at publicly-owned wastewater utilities, so it is unlikely to have an effect on small businesses.

11. Effect on Small Business (initial regulatory flexibility analysis):

The department does not expect the proposed rule language to impose additional requirements on small businesses. The rule language is meant to clarify existing requirements and make compliance easier for municipal sewerage systems.

12. Agency Contact Person:

Brett Schmidt, (608) 622-3477, brett.schmidt@wisconsin.gov

13. Place where comments are to be submitted and deadline for submission:

Written comments may be submitted at the public hearings, by regular mail, or email to:

Brett Schmidt, WY/3
Wisconsin Department of Natural Resources
P.O. Box 7921
Madison, WI 53707-7921
(608) 622-3477, brett.schmidt@wisconsin.gov

Comments may be submitted to the department contact person listed above or to DNRAdministrativeRulesComments@wisconsin.gov until the deadline given in the upcoming notice of public hearing. The notice of public hearing and deadline for submitting comments will be published in the Wisconsin Administrative Register and on the department's Hearings and Meetings Calendar.

- Access the Wisconsin Administrative Register (https://docs.legis.wisconsin.gov/code/register).
- Access the department's Hearings and Meetings Calendar (https://dnr.wisconsin.gov/calendar).
- Submit comments through the Wisconsin Administrative Rules Website (https://docs.legis.wisconsin.gov/code/chr/active).

The consent of the Attorney General will be requested for the incorporation by reference of the following standard methods:

- Two ASTM standards, which are listed below and provide minimum requirements for the installation of sanitary sewers of the specified pipe materials.
  - *ASTM C12-24 Standard Practice for Installing Vitrified Clay Pipe Lines*
  - *ASTM D2321-26 Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications*
- Three ASTM standards, which are listed below and describe procedures for testing to demonstrate the integrity of sewer pipes depending on the installed material and the construction procedures.
  - *ASTM C828-23 Standard Test Method for Low-Pressure Air Test of Vitrified Clay Pipe Lines*
  - *ASTM C924-02(2009) Standard Practice for Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method*
  - *ASTM F1417-25 Standard Practice for Installation Acceptance of Plastic Non-pressure Sewer Lines Using Low-Pressure Air*
- Twelve ASTM standards, which are listed below and provide minimum requirements for the manufacture of specific kinds of pipes typically used in construction of wastewater collection systems. These standards identify minimum requirements for materials and quality of work, design, fabrication, and testing of pipe sections.
  - *ASTM C14-20(2025) Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe*
  - *ASTM C76-25 Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe*
  - *ASTM C655-19a(2025) Standard Specification for Reinforced Concrete D-Load Culvert, Storm Drain, and Sewer Pipe*
  - *ASTM C700-18(2022) Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated*
  - *ASTM A746-18(2022) Standard Specification for Ductile Iron Gravity Sewer Pipe*
  - *ASTM D3034-24e1 Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings*
  - *ASTM D2680-20(2025) Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Composite Sewer Piping*
  - *ASTM C443-21 Standard Specification for Joints for Concrete Pipe and Manholes,*

Using Rubber Gaskets
  - *ASTM C425-22 Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings*
  - *ASTM D2241-25a Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)*
  - *ASTM D2996-23 Standard Specification for Filament-Wound "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe*
  - *ASTM D2239-25 Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter*
- Six ASTM standards, which are listed below and describe minimum requirements for soil sampling and testing related to the construction or retrofitting of sewage treatment lagoons.
  - *ASTM D1586/D1586M-18e1 Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils*
  - *ASTM D1587/D1587M-15 Standard Practice for Thin-Walled Tube Sampling of Fine-Grained Soils for Geotechnical Purposes (withdrawn in 2024)*
  - *ASTM D3550/D3550M-17 Standard Practice for Thick Wall, Ring-Lined, Split Barrel, Drive Sampling of Soils*
  - *ASTM D422-63(2007)e2 Standard Test Method for Particle-Size Analysis of Soils*
  - *ASTM D4318-17e1 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils*
  - *ASTM D698-12(2021) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3))*
- Five AWWA standards, which are listed below and provide minimum requirements for the manufacture of specific kinds of pipes typically used in construction of wastewater collection and drinking water distribution systems. These standards identify minimum requirements for materials and quality of work, design, fabrication, and testing of pipe sections.
  - *AWWA C300-22 Reinforced Concrete Pressure Pipe, Steel-Cylinder Type*
  - *AWWA C200-23 Steel Water Pipe, 6 In. (150 mm) and Larger*
  - *AWWA C151/A21.51-23 Ductile-Iron Pipe, Centrifugally Cast*
  - *AWWA C900-22 Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 60 In. (100 mm Through 1,500 mm)*
  - *AWWA C950-25 Fiberglass Pressure Pipe*
- A single ANSI standard, which is listed below:
  - *ANSI/ISEA Z358.1-2014(R020) American National Standard for Emergency Eyewash and Shower Equipment,* which establishes minimum performance and use requirements for eyewash and shower equipment for the emergency treatment of the eyes or body of a person who has been exposed to hazardous materials.
- A single NFPA standard, which is listed below:
  - *NFPA820-24 Standard for Fire Protection in Wastewater Treatment and Collection Facilities*, which provides requirements for protection against fire and explosion hazards specific to wastewater treatment facilities and their associated collection systems.

RULE TEXT

*[**Note to LRB:** The proposed rule differs from Wisconsin drafting style in the following ways for the reasons described:*

- *Throughout ch. NR 110, metric units are shown followed by U.S. customary units in parentheses. This code revision does the same for consistency.*
- *The code retains the slash in the phrase "infiltration/inflow", as that is the proper engineering terminology for the regulations contained in this code.]*

SECTION 1. NR 108.02 (13) (c) and (d) and (14) are amended to read:

NR 108.02 (13) (c) Any new sewerage system or abandonment of an existing sewerage system in whole or in part.

(d) Any improvements, extensions, or alterations of existing sewerage systems ~~which~~ that may affect the quality or quantity of effluent or the location of any outfall~~;~~, or that are otherwise subject to the design requirements under ch. NR 110.

(14) "Sewerage system" means all structures, including sewage treatment facilities, conduits, and pipelines, by which sewage is collected and disposed of, except plumbing inside and in connection with buildings served, and service pipes, from building to street main.

SECTION 2. NR 108.04 (2) (c) 2. (Note) is created to read:

NR 108.04 (2) (c) 2. **Note:** Pursuant to s. 443.08, Stats., no individual may practice or offer to practice professional engineering in Wisconsin as a principal, officer, employee, or agent of a firm, partnership, or corporation unless all personnel who practice or offer to practice on its behalf as professional engineers are registered in Wisconsin, and the firm, partnership, or corporation has been issued a certificate of authorization.

SECTION 3. NR 110.01 is amended to read:

NR 110.01 Applicability. This chapter is applicable to all new or modified sewerage systems, excluding only industrial waste treatment facilities. This chapter also applies to sewerage systems employing land ~~disposal~~ treatment of sewage effluent, except those systems defined as plumbing within the purview of s. 145.01 (10) (a) 2., Stats.

SECTION 4. NR 110.03 (1) is renumbered (1r) and amended to read:

NR 110.03 (1r) "Approved areawide ~~waste treatment~~ water quality management plan" means a plan or element thereof developed pursuant to Section 208 of the Federal Water Pollution Control Act Amendments of 1972 as amended by the Clean Water Act Amendments of 1977 (33 USC 1251 et seq.) and approved by the state of Wisconsin.

SECTION 5. NR 110.03 (1g) and (1g) (Note) are created to read:

NR 110.03 (1g) "ANSI" means the American National Standards Institute.

Note: Copies of ANSI standards incorporated by reference in this chapter are available at the legislative reference bureau and may be obtained for personal use at https://webstore.ansi.org or from the American National Standards Institute, 1180 6th Ave, 10th floor, New York, NY 10036.

SECTION 6. NR 110.03 (4), (4) (Note), (6), and (6) (Note) are amended to read:

(4) "ASTM" means ~~standards developed by~~ ASTM International, ~~100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959~~ formerly known as American Society for Testing and Materials.

Note: Copies of ASTM standards ~~referenced~~ incorporated by reference in this chapter are available ~~for inspection at the office of the department of natural resources, the secretary of state's office, and~~ at the legislative reference bureau, and may be obtained for personal use at https://store.astm.org or from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

(6) "AWWA" means the American Water Works Association~~, 6666 West Quincy Avenue, Denver, CO 80235~~.

Note: Copies of AWWA standards ~~referenced~~ incorporated by reference in this chapter are available ~~for inspection at the offices of the department of natural resources, the secretary of state's offices, and~~ at the legislative reference bureau, and may be obtained for personal use at https://store.awwa.org or from the American Water Works Association, 6666 West Quincy Avenue, Denver, CO 80235.

SECTION 7. NR 110.03 (13d), (20), (20) (Note), (22m), (22m) (Note), and (24) are created to read:

NR 110.03 (13d) "Facilities plan" means a plan or study that demonstrates the need for a proposed new or improved sewerage system or sewerage system components and that demonstrates, through a systematic evaluation of alternatives, that the selected alternative is the most cost-effective means of meeting the demonstrated need.

(20) "Maintenance project" means a construction or installation project that does not meet the definition of a reviewable project under sub. (27) and will not be financed under ch. NR 162.

Note: Maintenance projects should be accomplished with materials and methods consistent with applicable state requirements for sewerage systems. For sewage collection system projects, if a sewer is being repaired or replaced at the same location, and with the same pipe size and slope, then the project is a maintenance project. For lift station projects, if there is no relocation and if the replacement pumps or equipment being installed are substantially the same in design, size, and function as the existing ones, then it is a maintenance project.

(22m) "NFPA" means the National Fire Protection Association.

Note: Copies of NFPA standards incorporated by reference in this chapter are available at the legislative reference bureau and may be obtained for personal use at https://www.nfpa.org or from the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

(24) “Pilot study” means an investigation or inquiry to evaluate the suitability of potential future installation, construction, or implementation of equipment, systems, or technologies at a sewage treatment facility.

SECTION 8. NR 110.03 (27) is amended to read:

NR 110.03 (27) “Reviewable project" means any construction or installation project for which department approval is required~~, pursuant to~~ under s. 281.41, Stats., including any new sewerage system; abandonment of an existing sewerage system in whole or in part; a new use for an existing sewerage system component, structure, or process; ~~and,~~ any improvements, extensions, or alterations of existing sewerage systems ~~which~~ that may ~~effect~~ affect the quality or quantity of effluent or the location of any outfall, or that are otherwise subject to the design requirements in this chapter.

SECTION 9. NR 110.03 (27) (Note), (27w), (27w) (Note), and (29) (Note) are created to read:

NR 110.03 (27) Note: The department may require any sub-standard component of an existing sewerage system to be brought into compliance with applicable state standards when a future reviewable project is submitted for that component or related components.

(27w) “Septage” means the scum, liquid, sludge, or other waste from a septic tank, soil absorption field, holding tank, privy, or other component of a private on-site wastewater treatment system. “Septage” does not include the waste from a grease interceptor.

Note: This definition is aligned with the definition of septage in s. 281.49(1)(m), Stats.

(29) Note: Other terms for a sewage treatment facility include, but are not limited to, sewage treatment plant, sewage disposal plant, wastewater treatment plant, wastewater treatment facility, water reclamation facility, water recycling facility, and water resource recovery facility.

SECTION 10. NR 110.05 is repealed.

SECTION 11. NR 110.06 (1) is amended to read:

NR 110.06 (1) All construction plans for reviewable projects submitted to the department shall be complete, final, and in conformance with ch. NR 108~~, and~~. Construction plans shall bear a suitable title block which includes the name of the owner, the scale, and the date. The north point shall be shown on each plan. All plans shall be clear and legible. Blueprints will not be accepted. The datum used shall be indicated and shall be related to U.S.G.S. datum.

SECTION 12. NR 110.07 (3) is repealed.

SECTION 13. NR 110.08 (1), (2), and (4) are amended to read:

NR 110.08 (1) APPLICABILITY. A facilities plan shall be prepared for each reviewable project submitted to the department for approval. A facilities plan shall be submitted under the signature and the seal of a professional engineer registered in Wisconsin. A facilities plan may be a new comprehensive facilities plan, an amendment to an approved comprehensive facilities plan, or an abbreviated facilities plan meeting the requirements of s. NR 110.09 (9) or 110.10 (2). The planning period for facilities planning is 20 years. A facilities plan may not be amended outside of its original planning period. Facilities plans for sewage treatment facilities or new sewage collection systems shall be submitted to and approved by the department prior to submittal of the construction plans and specifications. The department may accept construction plans and specifications for review prior to facilities plan approval provided that all substantive issues of the facilities plan review have been resolved.

(2) CONTENT. The facilities plan for municipally owned sewage treatment facilities, sewage collection systems, and interceptors shall contain all of the information required by s. NR 110.09 (1) through ~~(6)~~(9), 110.10 (1), (1m), and (2), or 110.11 (1) and (1m), whichever are applicable. The following facilities planning requirements do not apply to non-municipally owned facilities: s. NR 110.09 (1) (b) 3., 5., and 8., and (2) (b) to (e) and (j) to (m). The level of detail necessary to fulfill the requirements of this subsection may vary depending on the size and complexity of the project.

(4) CONFORMANCE WITH APPROVED AREAWIDE ~~WASTE TREATMENT~~ WATER QUALITY MANAGEMENT PLANS. All approvable sewerage system ~~facility~~ facilities plans must be in conformance with approved areawide ~~waste treatment~~ water quality management plans unless

the department determines that such plans conflict with the department's responsibilities to protect, maintain, and improve the quality and management of the waters of the state, ground and surface, public and private. In the absence of an approved areawide ~~waste treatment~~ water quality management plan, no determination of such conformance is required.

SECTION 14. NR 110.08 (4) (Note) is created to read:

NR 110.08 (4) Note: Private interceptor main sewers must be designed in accordance with applicable approved areawide water quality management plans as required by s. SPS 382.30 (12) (b).

SECTION 15. NR 110.09 (1) (b) 5., 10., and 11. are amended to read:

NR 110.09 (1) (b) 5. For facilities plans for state funded projects under ch. NR 162, parallel cost estimates shall be provided for the facilities necessary to transport ~~and/or~~ and treat the fundable capacity, as well as a cost estimate for the total proposed sewerage system.

10. A brief statement demonstrating that the authorities who will be implementing the plan have the necessary legal, financial, institutional, and managerial resources available to ~~insure~~ ensure the construction, operation, and maintenance of the proposed treatment works.

11. A description of potential opportunities for recreation, open space, and access to bodies of water analyzed in planning the proposed sewerage system and the recommended actions. The ~~facility~~ facilities plan shall also describe measures taken to coordinate with federal, state, and local recreational programs and with recreational elements of applicable approved areawide ~~waste treatment~~ water quality management plans.

SECTION 16. NR 110.09 (1) (b) 12., 12. (Note), and 13. are created to read:

NR 110.09 (1) (b) 12. If a facilities plan proposes a new sewage treatment facility or expanded sewage treatment facility that increases the capacity by at least 20 percent, the facilities plan shall address the need for and include plans for the disposal of septage, including all of the following:

a. The amount of septage produced throughout the septage service area and the expected increase in septage production during the planning period.

b. The capacity for the disposal of septage during the planning period on land within the septage service area, in the sewage treatment facility, and by other available methods.

c. The location of private on-site wastewater treatment systems, as defined in s. 145.01(12), Stats., within the septage service area, and the distances required to haul septage for disposal either on land or in the sewage treatment facility.

d. The potential for contracts with private on-site wastewater treatment system owners, licensed disposers, as defined in s. 281.49 (1) (b), Stats., or municipalities to assure delivery of septage to the sewage treatment facility.

Note: Subdivision 12. is intended to implement the requirements of s. 281.41 (3), Stats.

13. A description of watershed-based practices that could be used to meet applicable water quality-based effluent limitations, which may include water quality trading and watershed adaptive management.

SECTION 17. NR 110.09 (2) (e) 1. to 4. are amended to read:

NR 110.09 (2) (e) 1. Biological or physical-chemical treatment and discharge to receiving waters.

2. Systems employing the reuse of wastewater and recycling of pollutants~~;~~.

3. Land application techniques~~;~~.

4. Systems including revenue generating applications~~; and~~.

SECTION 18. NR 110.09 (2) (e) 6. is created to read:

NR 110.09 (2) (e) 6. Watershed practices such as water quality trading and watershed adaptive management.

SECTION 19. NR 110.09 (2) (f) and (j) 1. and 2. are amended to read:

NR 110.09 (2) (f) All construction of publicly-owned sewerage systems and privately owned domestic sewerage systems discharging to surface waters shall be based upon application of secondary treatment as a minimum. Where application of secondary treatment would not provide for attainment of water quality standards, the facilities plan shall provide for attaining the applicable standards by designing to meet appropriate water quality related effluent limitations. Sewerage systems discharging to the ground water shall comply with the applicable discharge requirements of ch. NR 206. The alternative of treating combined sewer overflows shall also be considered.

(j) 1. ~~'Population projections.'~~ Population projections for facilities planning shall ~~be in conformance with~~ consider those contained in applicable approved areawide ~~waste treatment~~ water quality management plans and rules adopted pursuant to ss. 16.96 and 281.57 (4) (b), Stats. If such projections are not available, the engineer shall project future population growth based on trends in the recent past. Facilities plans shall include a description of the methods used to derive the population projections.

2. ~~'Wastewater flow estimates.'~~ In determining total average flow for the design of sewerage systems, the flows to be considered include the average daily base flows (ADBF) expected from each of the following: residential sources, commercial sources, institutional sources, and industries the system will serve plus allowances for future industries and ~~nonexcessive~~ non-excessive infiltration or inflow.

SECTION 20. NR 110.09 (2) (j) 2m. (title) and 3. (title) are repealed.

SECTION 21. NR 110.09 (2) (j) 3. b. is amended to read:

NR 110.09 (2) (j) 3. b. While many uncertainties accompany forecasting future industrial flows, there is still a need to allow for some unforeseeable future industrial growth. Thus, design capacity of the treatment works may include (in addition to the existing industrial flows and future documented industrial flows) a nominal flow allowance for future nonidentifiable industries or for unplanned industrial expansions, provided that areawide ~~waste treatment~~ water quality management plans, land-use plans and zoning provide for the industrial growth. This additional allowance for future unplanned industrial flow may not normally exceed 5%, or 10% for towns with less than 10,000 population, of the total average design flow of the treatment

works exclusive of the allowance or 25% of the total industrial flow, existing plus documented future, whichever is greater.

SECTION 22. NR 110.09 (2) (j) 4. (title) is repealed.

SECTION 23. NR 110.09 (2) (j) 4. c. and (p) to (r) are amended to read:

NR 110.09 (2) (j) 4. c. A municipality may stage the construction of a sewage treatment ~~plant~~ facility for a shorter period than the maximum allowed under this subdivision. A shorter staging period might be based upon environmental factors (secondary impacts, compliance with other environmental laws, energy conservation, water supply), an objective concerning planned modular construction, the utilization of temporary treatment ~~plants~~ facilities, or attainment of consistency with locally adopted plans including comprehensive and capital improvement plans. However, the staging period may in no case be less than 10 years, because of associated cost penalties and the time necessary to plan and construct later stages.

(p) An assessment of the location of land ~~disposal~~ treatment systems relative to public water supply wells. The location and horizontal separation from the proposed land ~~disposal~~ treatment site and any public water supply well shall be shown. The assessment shall discuss the hydrogeologic conditions of the area, the direction of groundwater movement, the depth of the public well casing, and any other appropriate information. The department will determine whether the separation distance between the land ~~disposal~~ treatment system and the public well is sufficient to protect the public health and quality of the public water supply.

(q) Soil boring logs if the selected treatment alternative includes lagoons or land ~~disposal~~ treatment of effluent. The borings shall supply accurate information about the soil conditions, and groundwater and bedrock elevations at the proposed treatment facility site.

(r) ~~Any facility~~ A facilities plan ~~which~~ that recommends the abandonment of a ~~wastewater treatment, sludge or septage storage lagoon, or land disposal system~~ sewage treatment facility in whole or in part shall include an abandonment plan. ~~An abandonment plan outlining~~ The abandonment plan shall meet all of the following requirements:

1. Outline the proposed method of facility abandonment ~~of the facility shall be submitted~~ as part of the ~~facility~~ facilities plan submitted to the department for approval. ~~This abandonment plan shall provide~~

Note: Abandonment plans can involve reuse, repurposing, restoration, or other approved disposition of the facility or portions thereof to be abandoned.

2. Provide for the removal and proper recycling, treatment, or disposal of any accumulated solid matter, solid or liquid wastes, or wastes in combination with soil. All recycling, treatment, and disposal shall be conducted so as to protect public health and the environment. ~~Unless otherwise directed by the department, all abandonment plans for wastewater treatment, sludge or septage storage lagoons, or high rate land disposal systems shall comply~~

3. Comply with ch. NR 720 for soils that have been contaminated by the contents of the lagoon or system. ~~The abandonment plan shall address~~

4. Address relandscaping necessary to prevent accumulation of standing water or runoff and ~~shall~~ provide for completion of the relandscaping within 2 years of the date on which the structure was last used as it was originally intended.

5. Include all of the following requirements related to groundwater monitoring:

a. The ~~department shall require~~ facility shall conduct groundwater monitoring for a minimum of one year at a quarterly frequency after the abandonment of facilities ~~which~~ that have an existing groundwater monitoring system. ~~Groundwater monitoring may be required on a case-by-case basis for~~ For facilities ~~which~~ that do not have existing groundwater monitoring systems, the facility shall conduct groundwater monitoring if required by the department on a case-by-case basis.

b. The facility shall review the monitoring data ~~shall be reviewed~~ with the department after 1 year and the department shall determine whether groundwater monitoring should be continued or not.

c. Any groundwater monitoring wells ~~which~~ that are no longer necessary shall be abandoned in accordance with ch. NR 141 and documentation of well abandonment shall be provided to the department.

SECTION 24. NR 110.09 (2) (s) is created to read:

NR 110.09 (2) (s) An assessment of watershed-based practices such as water quality trading and watershed adaptive management as potential alternatives to meet applicable water quality-based effluent limitations. This assessment shall be an integral part of the analysis of alternatives for cost-effectiveness.

SECTION 25. NR 110.09 (3) (c) and (f) (intro.) and 1. to 5. and (4) are amended to read:

NR 110.09 (3) (c) *Evaluation of alternatives.* This discussion shall include a comparative analysis of feasible options and a systematic development of ~~wastewater sewage~~ treatment alternatives. The alternatives shall be screened with respect to capital and operating costs; significant primary and secondary environmental effects; physical, legal, or institutional constraints; and whether or not they meet regulatory requirements. ~~Special and induced impacts such as development.~~ The reasons for rejecting any alternatives shall be presented in addition to any significant environmental benefits precluded by rejection of an alternative. The analysis should consider all of the following, when relevant to the project:

1. Flow and waste reduction measures, including infiltration/inflow reduction~~;~~.

2. Alternative locations, capacities, and construction phasing of facilities~~;~~.

3. Alternative waste management techniques, including treatment and discharge, wastewater reuse and land application~~;~~.

4. Alternative methods for disposal of sludge and other residual waste, including process options and final disposal options~~;~~.

5. Improving effluent quality through more efficient operation and maintenance~~;~~.

(f) *Documentation.* Sources of information used to describe the existing environment and to assess future environmental impacts should be documented. In addition to the

department, these sources should include regional, state and federal agencies with responsibility or interest in the types of impacts listed in par. (a). In particular, the following agencies should be consulted, as applicable:

1. Local, and regional land use planning agencies and areawide ~~waste treatment~~ water quality management planning agencies for assessments of land use trends and population projections, especially those affecting size, timing, and location of facilities~~;~~.

2. The HUD regional office if a project involves a flood risk area identified under the Flood Disaster Protection Act of 1973 (Pub. L. 93-234)~~;~~.

3. The state coastal zone management agency, if a coastal zone is affected~~;~~.

4. The secretary of the interior or secretary of agriculture, if a wild and scenic river is affected~~;~~.

5. The secretary of the interior or secretary of commerce, if a threatened or endangered species is affected~~;~~.

(4) PUBLIC HEARING. Municipalities shall hold at least one public hearing before a facilities plan is adopted. A municipality shall make a copy of the facilities plan ~~should be~~ available for public review before the hearing and at the hearing, since these hearings provide an opportunity for public comment on the issues associated with the facilities plan. The department may waive the public hearing requirement for a facilities plan if average residential sewer user charges are not anticipated to increase by more than 20 percent based upon the selected alternative.

SECTION 26. NR 110.09 (5) (e) is created to read:

NR 110.09 (5) (e) If infiltration/inflow can be demonstrated to be below threshold levels specified in this paragraph, the department may consider the infiltration/inflow to be non-excessive. The infiltration threshold criterion is whether the dry weather flow (the highest base flow plus infiltration occurring for a seven- to 14-day dry weather period during a year, such as during periods of high groundwater) is less than or equal to 120 gallons per capita per day. The inflow threshold criterion is whether the maximum daily flow during a storm is less than or equal

to 275 gallons per capita per day. The department may consider other guidelines or supplemental information when warranted by specific circumstances.

SECTION 27. NR 110.09 (7) (title), (intro.), (a), (b) (intro.) and 1. to 6., and (c) 1. and 2. are amended to read:

NR 110.09 (7) CONSTRUCTION PLANS AND SPECIFICATIONS FOR SEWAGE TREATMENT ~~PLANT~~ FACILITY PROJECTS. In addition to the requirements of ch. NR 108 and ss. NR 110.06 and 110.07, all of the following requirements shall be adhered to for submission of plans for sewage treatment ~~plants.~~ facilities, as applicable:

(a) *Overall plan.* A plan shall be submitted which shows the sewage treatment ~~plant~~ facility in relation to the remainder of the system. Sufficient topographic features shall be included to indicate its location with respect to streams and the point of discharge of treated effluent.

(b) *Layout.* A general layout plan shall be submitted which includes all of the following:

1. A contour map of the site~~;~~.

2. The size and location of ~~plant~~ the sewage treatment facility structures~~;~~.

3. A schematic flow diagram indicating the various ~~plant~~ sewage treatment facility units~~;~~.

4. Piping details including piping arrangements for bypassing individual units~~;~~.

5. The materials handled and the direction of flow through each pipe~~;~~.

6. The hydraulic profiles for sewage and sludge flows~~;~~.

(c) 1. The location, dimensions, elevations and details of all existing and proposed ~~plant~~ sewage treatment facility units~~;~~.

2. The elevation of high and low water level in the receiving stream~~;~~.

SECTION 28. NR 110.09 (8) (title), (a), (b) (Note) and 2. (intro.), and (c) (intro.), 1., and 4. are amended to read:

NR 110.09 (8) ADDITIONAL ~~FACILITY~~ FACILITIES PLANNING REQUIREMENTS FOR LAND ~~DISPOSAL~~ TREATMENT SYSTEM ALTERNATIVES.

(a) *General requirements.* In addition to the requirements of sub. (1), a report including a soil investigation and a hydrogeologic evaluation shall be submitted as part of the facilities plan for a land ~~disposal~~ treatment discharge alternative. The report shall detail the soil types, characteristics, variability and permeability, topography, groundwater conditions and quality, and other characteristics of the disposal site. Soil boring and test pit logs and soil analyses shall be provided. Wastewater characteristics which may influence the design of the disposal system shall also be discussed. Water supply quality, local groundwater use, and potential impacts of the facility on groundwater quality shall be included.

(b) **Note:** The skills and knowledge required of a hydrogeologist making submittals under this chapter include: the ability to apply hydrogeologic principles and practices to the siting, design and operation of land ~~disposal~~ treatment systems; knowledge of contaminants associated with land ~~disposal~~ treatment of wastewater, their transport mechanisms and fate in the environment; familiarity standards; and proficiency in the design of groundwater monitoring systems for defining the physical and chemical characteristics of groundwater flow. A soil scientist or other environmental scientist who can demonstrate the above skills and knowledge, as reflected in submittals made under this chapter, shall be deemed a “qualified person”.

2. The following site-specific groundwater information may be required as part of the facilities plan for land ~~disposal~~ treatment facilities:

(c) *Soil investigation.* The soil evaluation may be performed in conjunction with the hydrogeological evaluation; however, each evaluation shall be performed by a person who is qualified to perform the evaluation. ~~The~~All of the following site-specific soil information shall be submitted as a part of the facilities plan for land ~~disposal~~ treatment systems~~;~~:

1. Soil borings and sampling performed in accordance with ss. NR 110.24 (3) (d) and 110.24 (4) (d), and test pit analyses. The one boring per acre minimum ~~of~~ under s. NR 110.24 (3) (d) 4. does not apply to spray irrigation, ridge and furrow, or overland flow systems. A soil analysis may be required on a case-by-case basis for land ~~disposal~~ treatment systems. The

USDA soil classification system shall be used for spray irrigation systems, ridge and furrow, and overland flow systems.

4. In-field infiltration rates, ~~(~~measured at the proposed elevation of application~~)~~.

SECTION 29. NR 110.09 (9) and (10) are created to read:

NR 110.09 (9) ABBREVIATED FACILITIES PLANS FOR MINOR MODIFICATIONS TO SEWAGE TREATMENT FACILITIES. A facility may use an abbreviated facilities plan to satisfy the facilities planning requirements for minor modifications to a municipal sewage treatment facility. All of the following requirements apply to the use of an abbreviated facilities plan:

(a) Except as specified under par. (c), the department may allow an abbreviated facilities plan for modifications to an existing municipal sewage treatment facility if all of the following apply:

1. The assumptions of the most recent comprehensive facilities plan or facilities plan amendment still apply.

2. The proposed construction will be at the existing site.

3. The alterations would not change the overall system capacity.

4. The alterations do not involve new systems or processes or a change of outfall location.

5. Construction will have no significant environmental effects.

(b) The abbreviated facilities plan for minor modifications to sewage treatment facilities shall include all of the following components:

1. A brief description of the treatment facilities.

2. A concise problem statement.

3. The relevant background information.

4. A description of any significant environmental issues, including any air permit requirements, encroachments on wetlands or floodplains, cultural resource impacts, and endangered resources.

5. The alternatives considered.

6. A cost-effectiveness analysis.

7. An estimate of the effect of the project on annual charges for a typical residential sewer user.

8. The documentation of the public hearing held, if estimated annual charges for a typical residential sewer user will increase by more than 20 percent as a result of the proposed project.

9. A parallel cost estimate for state funded projects under ch. NR 162.

(c) If the planning assumptions of the most recent comprehensive facilities plan or facilities plan amendment for the municipal sewage treatment facility no longer apply, the facility may not use an abbreviated facilities plan.

(10) PILOT STUDIES. A pilot study may be conducted as needed to help inform wastewater facilities planning and design. A pilot study shall not add new outfalls or be conducted to meet effluent limits.

(a) A facility may not conduct a pilot study prior to department approval to conduct the study. The facility shall submit its proposal to the department no fewer than 30 days prior to implementing the pilot study.

(b) The facility shall provide the results of each pilot study to the department in report format no later than 90 days following data gathering.

(c) A pilot study shall meet all of the following requirements as applicable:

1. It shall be of finite duration not exceeding 1 year.

2. It shall have clearly defined goals and methodologies.

3. It may not involve permanent modifications of treatment facilities.

4. If multiple consecutive pilot studies are conducted, each pilot study shall be individually approved by the department.

(d) A facility may propose a reviewable project to the department based on the results of a pilot study. Pilot study reports shall be included in facilities plans as appropriate.

SECTION 30. NR 110.10 (1) (f), (g), and (L) are amended to read:

NR 110.10 (1) (f) *Population.* ~~Population~~ The annual population growth rate ~~(annual)~~ based on the most recent data for the municipality.

(g) *Sewer service area.* If the sewer project is tributary to a sewage treatment ~~plant~~ facility for which a service area ~~that~~ has been delineated as a part of an approved areawide ~~waste treatment~~ water quality management plan, ~~indicate~~ the location of the sewer shall be indicated on a map of the service area.

(L) *Environmental analysis.* The department may require the submittal of an environmental analysis meeting the requirements of s. NR 110.09 (3) for large or complex sewer projects, for those projects which are proposed to be constructed in environmentally sensitive areas, such as floodplains, waterways, wetlands, or areas with endangered or cultural resources, or for projects which involve significant public controversy.

SECTION 31. NR 110.10 (1m) is created to read:

NR 110.09 (1m) ABBREVIATED FACILITIES PLANS FOR SANITARY SEWER REPLACEMENT OR REHABILITATION. The department may allow an abbreviated facilities plan to satisfy the facilities planning requirements for sewer replacement or rehabilitation. All of the following requirements apply to use of an abbreviated facilities plan for sanitary sewer replacement or rehabilitation:

(a) A facility may submit an abbreviated facilities plan for sanitary sewer replacement or rehabilitation concurrently with construction plans and specifications.

(b) The abbreviated facilities plan for sanitary sewer replacement or rehabilitation shall include all of the following components:

1. A description of the proposed project and demonstration of need for the project, including age and condition of the sewer, inspection reports, flow monitoring, and other information as appropriate.

2. A brief evaluation of potential alternatives to correct the problem, including consideration of both rehabilitation and replacement.

3. The estimated project cost.

4. The expected effect, if any, on annual charges to a typical residential sewer user.

5. The documentation of the public hearing held, if significant environmental impacts may result or if typical annual residential sewer user charges will increase by more than 20 percent as a result of the proposed project.

6. The anticipated environmental impacts to floodplains, waterways, wetlands, endangered resources, cultural resources, or other environmentally sensitive areas.

7. A parallel cost estimate for state funded projects under ch. NR 162.

(c) An abbreviated facilities plan may not be used for new interceptor sewers or replacement sewers that provide capacity for growth in areas outside of an existing sanitary sewer service area as delineated in an approved areawide water quality management plan, if one exists.

SECTION 32. NR 110.10 (2) (a) is amended to read:

NR 110.10 (2) (a) Since the location and length of interceptors will influence growth, interceptor routes and staging of construction shall be planned carefully and shall be consistent with approved areawide ~~waste treatment~~ water quality management plans, growth management plans, and other environmental laws.

SECTION 33. NR 110.11 (1m) is created to read:

NR 110.11 (1m) ABBREVIATED FACILITIES PLANS FOR LIFT STATION PROJECTS. The department may allow an abbreviated facilities plan to satisfy the facilities planning

requirements for lift station projects. All of the following requirements apply to use of an abbreviated facilities plan for lift station projects:

(a) A facility may submit an abbreviated facilities plan concurrently with construction plans and specifications.

(b) The abbreviated facilities plan shall include all of the following components:

1. A description of the proposed project and demonstration of need for the project, including age and condition of the existing lift station if applicable, current and projected flows, and other information as appropriate.

2. A brief evaluation of potential alternatives to correct the problem.

3. The estimated project cost.

4. The expected effect, if any, on annual charges to a typical residential sewer user.

5. The documentation of the public hearing held, if significant environmental impacts may result or if typical annual residential sewer user charges will increase by more than 20 percent as a result of the proposed project.

6. The anticipated environmental impacts to floodplains, waterways, wetlands, endangered resources, cultural resources, or other environmentally sensitive areas.

7. A parallel cost estimate for state funded projects under ch. NR 162.

(c) An abbreviated facilities plan may not be used for lift station projects that provide capacity for growth in areas outside of an existing sanitary sewer service area as delineated in an approved areawide water quality management plan, if one exists.

SECTION 34. NR 110.12 (title) is amended to read:

NR 110.12 Owner, sewage treatment facility, and sewage collection system approval ~~requirements~~ requirements.

SECTION 35. NR 110.12 is renumbered NR 110.12 (1) and amended to read:

NR 110.12 (1) OWNER APPROVAL. If the engineer submitting plans to the department for approval is not an employee of or has not been retained by the owner of the sewerage system for which the plans are submitted, the owner shall provide written acceptance of the final plans ~~by the owner shall be required~~ prior to submission of the plans to the department.

SECTION 36. NR 110.12 (2), (2) (Note), (3), and (3) (Note) are created to read:

NR 110.12 (2) SEWAGE TREATMENT FACILITY APPROVAL. If a sanitary sewer or lift station is to be connected to or flow is ultimately received by a regional sewage treatment facility, the owner of the sewage treatment facility shall provide written acceptance of the final plans for construction of the sanitary sewer, lift station, or other applicable sewerage system infrastructure prior to submission of the plans to the department.

Note: A regional sewage treatment facility is one that receives flows from one or more satellite sewage collection systems.

(3) SEWAGE COLLECTION SYSTEM APPROVAL. If sewage flows generated by one municipality will be discharged into and conveyed through the sewage collection system infrastructure owned by a different municipality, the owner of the downstream sewage collection system through which the sewage flows would be conveyed shall provide written acceptance of the final plans for construction of the sanitary sewers and lift stations that would serve the upstream sewage flow-generating area. The downstream owner's written acceptance of these plans shall be provided before submission of these final plans to the department.

Note: For example, if Owner A proposes plans for construction of a sanitary sewer extension generating sewage flow that would pass through sewers owned by Owner B en route to a regional sewage treatment facility not owned by Owner B, the final plans must be accepted by Owner B prior to submission of the plans to the department.

SECTION 37. NR 110.13 (intro.) is created to read:

NR 110.13 The owner of a sewerage system, an engineer retained by the owner, or the owner's authorized representative shall ensure that the sewerage system meets all of the following design requirements, as applicable:

SECTION 38. NR 110.13 (1) (b) 2., (d) 2. and 3. and (2) (b), (d) 1. and 2., and (i) 1. and 2. are amended to read:

NR 110.13 (1) (b) 2. Interceptors shall be designed in accordance with s. NR 110.10 ~~(2)~~(3) (a).

(d) 2. Sanitary sewers shall be located with a minimum separation distance of ~~15~~ 8 meters (~~50~~ 25 feet) from private water system wells or any other wells subject to ch. NR 812.

3. Horizontal and vertical separation of sewers from public water mains shall comply with the requirements of ~~s. NR 811.67~~ s. NR 811.74. Horizontal and vertical separation of sewer from private water laterals shall comply with the requirements of s. SPS 382.40 (8) (b).

(2) (b) *Depth.* Sewers shall be designed deep enough to prevent freezing and, where economically feasible, to provide gravity basement drainage for sanitary wastes. Insulation shall be provided for sewers that cannot be placed at a depth sufficient to prevent freezing.

(d) 1. Sewers with diameters less than ~~91~~ 60 centimeters (~~36~~ 24 inches) shall be laid with straight alignment between manholes. Straight alignment shall be checked by a laser beam or other methods acceptable to the department.

2. The department may approve curvilinear sewers with diameters of ~~91~~ 60 centimeters (~~36~~ 24 inches) or larger on a case-by-case basis provided compression joints are specified, and ASTM or pipe manufacturers' maximum allowable pipe joint deflection limits are not exceeded. Curvilinear sewers shall be limited to simple curves that start and end at manholes. When curvilinear sewers are proposed, the recommended minimum slopes indicated under s. NR 110.13 (2) (c) shall be increased accordingly to provide a minimum velocity of 60 centimeters per second (2.0 feet per second) when flowing full.

(i) 1. Bedding classes A, B, or C, as described in ~~ASTM C12-09~~ ASTM C12-24, which is incorporated by reference, shall be used for all rigid pipe provided the proper strength pipe is used with the specified bedding to support the anticipated load.

2. Bedding classes I, II, or III, as described in ~~ASTM D2321-09~~ ASTM D2321-26, which is incorporated by reference, shall be used for all flexible pipe provided the proper strength pipe is used with the specified bedding to support the anticipated load.

SECTION 39. NR 110.13 (2) (i) 3. is created to read:

NR 110.13 (2) (i) 3. Contaminated soil shall be removed, properly disposed of according to chs. NR 500 to 520 requirements, and replaced with clean material. Clean clay cut-off walls shall be installed to minimize the movement of contaminants along the trench if required by the department.

SECTION 40. NR 110.13 (2) (k) 1. is amended to read:

NR 110.13 (2) (k) 1. Groundwater infiltration into sanitary sewer systems shall be minimized. Tests for infiltration shall be specified in the construction specifications. This may include appropriate water or low pressure air testing. The leakage outward or inward (exfiltration or infiltration) may not exceed 0.19 cubic meters per centimeter pipe diameter per kilometer per day (200 gallons per inch of pipe diameter per mile per day) for any section of the system. An exfiltration or infiltration test shall be performed with a minimum positive head of 60 centimeters (2 feet). The air test, if used, shall, at a minimum, conform to the test procedure described in ~~ASTM C828-06~~ ASTM C828-23 for clay pipe, ASTM C924-02 (2009) for concrete pipe, or ~~ASTM F1417-92 (2005)~~ ASTM F1417-25 for plastic pipe; these standards are incorporated by reference. The testing methods selected should take into consideration the range in groundwater elevations projected and ~~the situation during the test~~ other pertinent site conditions that may affect test results.

SECTION 41. NR 110.13 (3) (c), (d), (e), and (g) and (5) (e), (f) (intro.), 1. to 3., and 5., (g), and (h) (intro.), 1. and 3. are amended to read:

NR 110.13 (3) (c) *Drop pipe.* An outside drop pipe shall be provided for a sewer entering a manhole where the invert elevation of the entering sewer is 60 centimeters (2 feet) or more above the spring line of the outgoing sewer. The entire drop connection shall be encased in the concrete. Inside drop connection may be approved on a case-by-case basis. Inside drop connections shall be secured to the interior wall of the manhole and shall provide access for cleaning.

(d) *Diameter.* The minimum diameter of manholes shall be ~~1.1~~ 1.2 meters (~~42~~ 48 inches). A larger diameter is required for manholes with inside drops and may be necessary for manholes with large diameter sewers or multiple pipes connecting at the manhole. A minimum access diameter of 61 centimeters (24 inches) shall be provided.

(e) *Construction.* Manholes shall be constructed of precast concrete, monolithic concrete, ~~brick or block,~~ or other approved materials. Fiberglass manholes may be approved on a case-by-case basis. Fiberglass manholes may be approved for use in high traffic areas provided the top section of the manhole is not made of fiberglass.

(g) *Water tightness.* Solid watertight manhole covers shall be used wherever the manhole tops may be flooded by street runoff or high water. ~~Where groundwater conditions are unfavorable, manholes of brick or block shall be waterproofed on the exterior with plastic coatings supplemented by a bituminous waterproof coating or other approved coatings.~~ Inlet and outlet pipes shall be joined to the manhole with a gasketed flexible watertight connection or any watertight connection arrangement that allows differential settlement of the pipe and manhole wall to take place.

(5) (e) *Nonpressure pipe.* All nonpressure sewer pipe shall have sufficient strength to withstand the loads ~~which~~ that will exist. ~~The~~ Nonpressure pipe shall meet the following ~~are~~ minimum standards ~~for nonpressure pipe~~, which are incorporated by reference:

1. Concrete pipe shall meet the requirements of ~~ASTM C14-07~~ ASTM C14-20(2025), ~~C76-10~~ C76-25, or ~~C655-09;~~ C655-19a (2025).

2. Vitrified clay pipe shall meet the requirements of ~~ASTM C700-09;~~ ASTM C700-18(2022).

3. Steel pipe shall meet the requirements of ~~AWWA C200-05;~~ AWWA C200-23.

4. Ductile iron pipe and fittings shall meet the requirements of ~~ASTM A746-09;~~ ASTM A746-18(2022).

5. Polyvinyl chloride sewer pipe shall meet the requirements of ~~D3034-08 or ASTM F679-08~~ ASTM D3034-24e1.

6. ABS composite sewer pipe shall meet the requirements of ~~ASTM D2680-01(2009);~~ ASTM D2680-20 (2025).

(f) *Joints for nonpressure pipe.* The method of making joints and the materials used shall be included in the specifications and meet the minimum standards in subds. 1. to 5, which are incorporated by reference. Sewer joints shall be designed to minimize infiltration and to prevent the entrance of roots. Joint material shall be of such a composition as not to be adversely affected by the sewage.

1. Rubber gasket joints for concrete sewer pipe shall meet ~~ASTM C443-05ae1~~ ASTM C443-21.

2. Resilient joints for vitrified clay sewer pipe shall meet ~~ASTM C425-04 (2009)~~ ASTM C425-22.

3. Steel pipe joints shall meet the requirements of ~~AWWA C200-05~~ AWWA C200-23.

5. ABS composite sewer pipe shall be joined by solvent weld joints or by type OR mechanical–seal joints meeting the requirements of ~~ASTM D2680-01 (2009)~~ ASTM D2680-20 (2025).

(g) *Pressure sewer pipe and joints.* All pressure sewer pipe 10 centimeters (4 inches) or larger shall meet the following minimum requirements, which are incorporated by reference:

1. Ductile iron pipe and joints shall meet the requirements of ~~AWWA C151~~ AWWA C151/A21.51-23, which is incorporated by reference.

2. Steel pipe and joints shall meet the requirements of ~~AWWA C200-05~~ AWWA C200-23, which is incorporated by reference.

3. Concrete pipe and joints shall meet the requirements of ~~AWWA C300-04~~ AWWA C300-22, which is incorporated by reference.

4. Polyvinyl chloride pipe and joints shall meet the requirements of ~~AWWA C900-07~~ AWWA C900-22 (minimum class 150) or ~~ASTM D2241-09~~ ASTM D2241-25a (minimum class 250). Solvent weld joints may not be used.

5. Fiberglass reinforced–polyvinyl chloride composite pipe and joints shall meet the requirements of ~~AWWA C950-07~~ AWWA C950-25 (minimum class 250). Eight and 10–inch pipe shall have minimum category 3 stiffness as defined in ~~ASTM D2996-01 (2007) e1~~ ASTM D2996-23. Four and 6–inch pipe shall have a minimum category 2 stiffness as defined in ~~ASTM D2996-01 (2007)~~ ASTM D2996-23.

(h) *Small diameter pressure sewer pipe and joints.* All pipe and joints 8 centimeters (3 inches) in diameter or smaller to be used in grinder pumps shall meet the following minimum requirements, which are incorporated by reference:

1. Polyethylene pipe and joints which meet the requirements of ~~ASTM D2239-03~~ ASTM D2239-25 (minimum class 160), may be approved on a case–by–case basis depending on the expected system pressure relative to the pipe working strength. Solvent weld, butt fusion, or elastomeric joints will be acceptable.

3. Polyvinyl chloride pipe and joints shall meet the requirements of ~~ASTM D2241-09~~ ASTM D2241-25a (minimum class 160). Solvent weld or elastomeric joints will be acceptable.

SECTION 42. NR 110.14 (intro.) is created to read:

NR 110.14 The owner of a sewage lift station, an engineer retained by the owner, or the owner's authorized representative shall ensure that the sewage lift station meets all of the following design requirements, as applicable:

SECTION 43. NR 110.14 (3) (b) 7. and (c) 1. are amended to read:

NR 110.14 (3) (b) 7. All wet wells shall be designed based on fill time and minimum pump cycle time. With any combination of influent flows and pumping rate, the minimum pump cycle time shall be greater than or equal to 5 minutes. The pump manufacturer's duty cycle recommendations shall be utilized in selecting the minimum cycle time. The total fill time between pump on and off elevations in the wet well, at average design flow, may not exceed 30 minutes ~~to prevent septicity.~~, unless the facility is designed to provide flow equalization. When the anticipated initial flow tributary to the pumping station is less than the design average flow, provisions shall be made to prevent initial flows from exceeding the indicated fill time. When the

wet well is designed for flow equalization as part of a sewage treatment facility, provisions shall be made to prevent septicity.

(c) 1. All covered wet wells shall be vented to the atmosphere using an inverted “j" tube or other means. Adequate ventilation shall also be provided for all dry wells. Where the dry well is below the ground surface, permanent mechanical ventilation shall be provided. Ventilation systems shall also meet the requirements of NFPA 820-24, which is incorporated by reference.

SECTION 44. NR 110.14 (3) (c) 6. c. is created to read:

NR 110.14 (3) (c) 6. c. Mechanical ventilation for dry wells shall also be provided by both supply and exhaust fans, as required in NFPA820-24, except for covered process facilities that are not routinely entered by personnel or for small aboveground buildings and structures, including domes and covers, with a floor or surface of 9.3 square meters (100 square feet) or less that are physically separated from other buildings or structures and do not present a fire hazard to other buildings or structures.

SECTION 45. NR 110.14 (3) (e), (g) 1., and (j) 1. are amended to read:

NR 110.14 (3) (e) *Electrical equipment*. Electrical systems and components including motors, lights, cables, conduits, switchboxes, and control circuits~~, which~~ that will be located in wet wells~~,~~ or in enclosed or partially enclosed spaces where hazardous concentrations of flammable gases or vapors may be present~~,~~ shall comply with the NEC requirements for Class 1, ~~Group D,~~ Division 1, Group D locations. In addition, equipment located in the wet well shall be suitable for use under corrosive conditions. Each flexible cable shall be provided with a watertight seal and separate strain relief. A fused disconnect switch or equivalent circuit breaker located above ground shall be provided for the main power feed for all lift stations. When the equipment is exposed to weather, it shall meet the requirements of weatherproof equipment. Lift station control panels located outdoors shall be provided with a 110-volt power receptacle inside the control panel to facilitate maintenance. Ground fault circuit interruption protection shall be provided for all outdoor outlets.

(g) 1. All pumps~~, except grinder and effluent pumps,~~ handling raw wastewater shall be capable of passing spheres of at least 7.6 centimeters (3 inches) in diameter, and pump suction and discharge piping shall be at least 10 centimeters (4 inches) in diameter. ~~The department may allow the use of pumps with a lesser solids handling ability provided the pump is protected by a comminutor, a mechanically cleaned bar screen, or other suitable equipment.~~ The department may allow an exception to the requirement for passing solid spheres of at least 7.6 centimeters (3 inches) in diameter may be made on a case-by-case basis when the design includes protection from clogging or damage, such as grinder pumps.

(j) 1. At the design pumping rate, a cleansing velocity of at least 61 centimeters per second (2 feet per second) shall be maintained. The minimum force main diameter for raw wastewater shall be 10 centimeters (4 inches) or greater, except for specialized applications where adequate cleansing velocities cannot be achieved and shall be reviewed by the department on a case-by-case basis.

SECTION 46. NR 110.14 (3) (j) 1. (Note) is created to read:

NR 110.14 (3) (j) 1. Note: A maximum velocity of 240 centimeters per second (8 feet per second) is recommended to avoid high head loss and protect valves.

SECTION 47. NR 110.14 (3) (j) 3., 4., and 4. (Note) are amended to read:

NR 110.14 (3) (j) 3. When a force main enters the gravity sewer manhole, it shall discharge at a point not more than ~~60~~ 30 centimeters (~~2 feet~~1 foot) above the spring line of the receiving sewer. The receiving manhole shall have corrosion protection.

4. Friction losses through force mains shall be based on the ~~Hazen and Williams~~ Hazen-Williams formula or other acceptable method. The roughness coefficient “C" value used for design shall be noted on the design report.

Note: When the ~~Hazen and Williams~~ Hazen-Williams formula is used, ~~the department recommends~~ a “C" value ~~between~~ of 100 ~~and 125~~ shall be used for ~~all pipe except plastic pipe~~ design of force mains where unlined iron or steel pipe is used. ~~A “C" value between 120 and 140 is recommended for plastic pipe.~~ For other smooth pipe materials such as PVC, polyethylene, or lined ductile iron, a higher “C” value, not to exceed 120, may be allowed for

design. A range of “C” values should be considered, as the “C” value may change over the service life of a force main installation. When initially installed, force mains may have a significantly higher “C" value than they do as they age. ~~The lower “C" value (higher coefficient of friction) should be considered when calculating the head at design conditions. The higher “C" value should be considered when calculating the minimum head in the pump operating range power requirements.~~ The effect of the higher “C” value should be considered when calculating maximum power requirements and duty cycle time, to prevent damage to the motor. The effects of higher discharge rates on selected pumps and downstream facilities should also be considered.

SECTION 48. NR 110.15 (intro.) is created to read:

NR 110.15 The owner of a sewage treatment facility, an engineer retained by the owner, or the owner’s authorized representative shall ensure that the sewage treatment facility meets all of the following design requirements, as applicable:

SECTION 49. NR 110.15 (1) is amended to read:

NR 110.15 (1) DESIGN REPORT. ~~A design report shall be submitted~~ The municipality or engineer retained by the municipality shall submit a design report with plans and specifications for all sewage treatment facilities. This report shall summarize the design hydraulic loading, design biochemical oxygen demand (BOD), suspended solids and other appropriate pollutant loading, the sizing of treatment units, pump capacities, design calculations for major treatment units, and explain any deviations from the preliminary facilities planning design information which is required by s. NR 110.09 (1) (b).

SECTION 50. NR 110.15 (3) (title), (a) 5., and (d) 1. (intro.) are amended to read:

NR 110.15 (3) ~~PLANT~~ SEWAGE TREATMENT FACILITY LOCATION.

(a) 5. Location of a land ~~disposal~~ treatment system in a floodplain ~~will~~may be evaluated by the department on a case-by-case basis.

(d) 1. In order to minimize any potential odor, noise, and nuisances caused by sewage treatment facilities, and to enhance ~~plant~~ sewage treatment facility security and reliability, sewage treatment facilities shall be isolated from commercial establishments and from buildings occupied or intended for residential use, and from land which is actively being developed for commercial or residential use. The following separation distances shall be maintained:

SECTION 51. NR 110.15 (3) (d) 1. (Note) and 2. (Note) are created to read:

NR 110.15 (3) (d) 1. **Note:** Separation distance is measured from a residential or commercial structure to the edge of a treatment process or process building. These distances do not apply to property lines or non-process buildings such as administration buildings, garages, or labs.

2. **Note:** Reasonable attempts may include mailing multiple written notices or other contact attempts with each affected property owner.

SECTION 52. NR 110.15 (3) (e) and (4) (b) 2. and (d) are amended to read:

NR 110.15 (3) (e) *Protection of water supply wells*. ~~Wastewater~~Municipal sewage treatment facility units, lagoons, or storage structures shall adhere to the applicable minimum separation distances between water supply wells or any other well subject to chs. NR 811 and 812. ~~be located with a minimum separation distance of 1,000 feet from a community water system well, and 100 feet from a private water system well or any other well subject to ch. NR 812. Wastewater treatment plant effluent pipes shall be located with a minimum separation distance of 50 feet from a private water system well or any other well subject to ch. NR 812.~~

(4) (b) 2. When actual operating data is not available, the design loading shall be based on a contribution of 0.08 kilograms (0.17 pounds) of biochemical oxygen demand per capita per day and 0.09 kilograms (0.20 pounds) of suspended solids per capita per day, unless information is submitted to justify alternate designs. If nitrification is required, 0.016 kilograms (0.036 pounds) total Kjeldahl nitrogen per capita per day may be used. When garbage grinders are used in areas tributary to a sewage treatment facility, the design basis shall be increased to 0.10 kilograms (0.22 pounds) of biochemical oxygen demand per capita per day, and ~~0.22~~ 0.11

kilograms (0.25 pounds) of suspended solids per capita per day. If nitrification is required, 0.021 kilograms (0.046 pounds) total Kjeldahl nitrogen per capita per day may be used.

(d) *Sludge storage.* Adequate sludge storage shall be provided as indicated in ss. NR 110.09 (2) (h) 5~~, and~~., 110.26 (10), and 204.10.

SECTION 53. NR 110.15 (5) (c) is repealed and recreated to read:

NR 110.15 (5) (c) *Flow measurement.* 1. All flow measurement equipment shall be sized to function effectively over the full range of flows expected and shall be protected against freezing. Equipment shall be provided to enable the facility to measure and record all of the following flows, as applicable:

a. Sewage treatment facility influent or effluent flow, when expected to be equivalent.

b. Sewage treatment facility influent and effluent flows, when both are required by the department. If influent flow is significantly different from effluent flow, both shall be measured. This applies to installations such as lagoons, sequencing batch reactors, and facilities with excess flow storage or flow equalization.

c. Other flows required to be monitored under the provisions of the discharge permit.

d. Other flows required for process unit operational control or monitoring.

2. Methods for measuring flow shall be provided as indicated under s. NR 218.05.

SECTION 54. NR 110.15 (5) (e) is amended to read:

NR 110.15 (5) (e) *New processes, methods and equipment.* The department encourages the development of new process, methods, or equipment for the treatment of sewage. However, where new processes, methods, or equipment are proposed and where limited data is available which demonstrates the performance of the equipment, the department may require written certification that the use or design of the equipment is in accordance with the manufacturer's guidelines. ~~Furthermore, the department may require the posting of a performance bond by the manufacturer.~~

SECTION 55. NR 110.15 (5) (f) is repealed.

SECTION 56. NR 110.15 (5) (j) and (q) 3. (intro.) and 4. are amended to read:

NR 110.15 (5) (j) *Valve identification.* All process valves shall be identified in the plans and specifications and labeled during construction.

(q) 3. The department recommends that all of the following safety ~~measure~~ measures be considered in the design of ~~wastewater~~ sewage treatment facilities:

4. The safety and health rules set forth in ch. SPS 332, and appropriate federal and local safety codes shall be adhered to in the operation of ~~wastewater~~ sewage treatment ~~plants~~ facilities.

SECTION 57. NR 110.15 (5) (q) 7. and 7. (Note) are created to read:

NR 110.15 (5) (q) 7. Ventilation systems meeting the requirements of NFPA820-24, which is incorporated by reference, shall be provided for all enclosed wastewater pumping and process-related areas.

Note: NFPA820-24 does not establish criteria applicable to spaces devoted to administrative areas, laboratories, or other ancillary spaces.

SECTION 58. NR 110.16 (intro.) is created to read:

NR 110.16 The owner of a sewage treatment facility that includes a screening device, an engineer retained by the owner, or the owner's authorized representative shall ensure that the screening device meet all of the following design requirements, as applicable:

SECTION 59. NR 110.16 (1) (a) and (c) and (2) (b) 1. are amended to read:

NR 110.16 (1) (a) *Applicability.* All ~~wastewater~~ sewage treatment ~~plants shall be provided with~~ facilities shall have protection for pumps and other equipment by installing coarse screens, bar racks, mechanically cleaned bar racks or comminutors.

(c) *Ventilation.* Screening areas shall be ventilated. Fresh air shall be introduced continuously at a rate of 12 air changes per hour, or intermittently at a rate of 30 air changes per hour. Ventilation systems shall also meet the requirements of NFPA 820-24, which is incorporated by reference, including that mechanical ventilation shall be provided by both supply and exhaust fans except for covered spaces not routinely entered by personnel and small aboveground buildings and structures, including domes and covers, with a floor or surface of 9.3 square meters (100 square feet) or less that are physically separated from other buildings or structures and do not present a fire hazard to other buildings or structures.

(2) (b) 1. Maximum ~~clean~~ clear spacing between bars may not exceed 5 centimeters (2 inches).

SECTION 60. NR 110.16 (2) (d) is created to read:

NR 110.16 (2) (d) *Fine Screens.* 1. Clear spacing between bars may be greater than 0.16 centimeters (0.06 inches) and less than 0.6 centimeters (0.25 inches). Fine screens shall not be considered equivalent to primary sedimentation although may be used in lieu of primary sedimentation where subsequent treatment units are designed on the basis of anticipated screen performance. Selection of screen capacity shall consider flow restriction due to retained solids, gummy materials, frequency of cleaning, and extent of cleaning. Additional provisions for removal of floatable oils and greases shall be considered.

2. A minimum of two fine screens shall be installed, each unit being capable of independently operating. The facility shall have the ability to treat the design peak instantaneous flow with one unit out of service. The department may approve installations where one fine screen is installed with a supplemental bar screen on a case-by-case basis.

3. Fine screens shall be protected from large debris that may cause damage, protected from freezing, and be located to facilitate maintenance.

SECTION 61. NR 110.17 (intro.) is created to read:

NR 110.17 The owner of a sewage treatment facility that includes a grit removal facility, an engineer retained by the owner, or the owner's authorized representative shall ensure that the grit removal facility meets all of the following design requirements, as applicable:

SECTION 62. NR 110.17 (1) and (3) (c) 2. are amended to read:

NR 110.17 (1) APPLICABILITY. Grit removal facilities are recommended for all sewage ~~plants~~ treatment facilities and are required for ~~plants~~ facilities receiving sewage from combined sewers or from sewer systems receiving substantial amounts of grit.

(3) (c) 2. The detention time at the maximum design flow rate ~~should not exceed 3~~ shall be in the range of 3 to 5 minutes.

SECTION 63. NR 110.17 (3) (e) is created to read:

NR 110.17 (3) (e) *Vortex grit removal.* For vortex grit removal systems, vortex flow pattern shall meet all of the following conditions:

1. Detention time at average design flow rate shall be between 20 and 30 seconds.

2. Grit may be removed by a grit slurry or air-lift pump.

3. If more than two units are installed, flow splitting may be required to prevent settling of grit upstream of grit chambers.

SECTION 64. NR 110.18 (intro.) is created to read:

NR 110.18 The owner of a sewage treatment facility that includes a settling tank, an engineer retained by the owner, or the owner's authorized representative shall ensure that the settling tank meets all of the following design requirements, as applicable:

SECTION 65. NR 110.18 (1) (a) 1., (2) (b), (c) 7., (d) 2. are amended to read:

NR 110.18 (1) (a) 1. Multiple settling tanks shall be provided at all sewage treatment ~~plants~~ facilities with an average design flow ~~which~~ that exceeds 1,890 cubic meters per day (0.5 million gallons per day).

(2) (b) *Tank features.* 1. The side water depth of mechanically cleaned settling tanks shall be ~~as shallow as practical but not less than 2.1~~ at least 3 meters (~~7 feet~~ 10 feet). Final clarifiers for activated sludge may not be less than ~~3~~3.7 meters (~~10 feet~~ 12 feet) in depth. Final clarifier for fixed film treatment systems may not be less than ~~2.1~~3 meters (~~7 feet~~ 10 feet).

(c) 7. Suitable mechanical sludge and scum collection equipment shall be ~~provided~~ installed in all settling tanks. ~~Provisions for separate scum washing shall be made for treatment facilities which do not have primary settling facilities.~~

(d) 2. For sewage treatment ~~plants~~ facilities with an average design flow greater than 3,785 cubic meters per day (one million gallons per day), the department may approve an overflow rate of 188 cubic meters per meter per day (15,000 gallons per foot per day).

SECTION 66. NR 110.19 (intro.) is created to read:

NR 110.19 The owner of a sewage treatment facility that uses a trickling filter, an engineer retained by the owner, or the owner's authorized representative shall ensure that the trickling filter meet all of the following design requirements, as applicable:

SECTION 67. NR 110.19 (1) (a) and (b) are amended to read:

NR 110.19 (1) (a) *Surface water discharge.* New trickling filters shall be used in conjunction with other treatment units which, in combination, will produce an acceptable level of treatment as defined in s. NR 110.15 (2) (a). Existing trickling filters may be used as a treatment unit in ~~plant~~ sewage treatment facility expansion if the effluent quality requirements of s. NR 110.15 (2) (a) are met.

(b) *Land ~~disposal~~ treatment.* Trickling filter treatment systems are an acceptable means of treatment prior to land ~~disposal~~ treatment of effluent.

SECTION 68. NR 110.20 (intro.) is created to read:

NR 110.20 The owner of a sewage treatment facility that uses rotating biological contactors, an engineer retained by the owner, or the owner's authorized representative shall ensure that the rotating biological contactors meet all of the following design requirements, as applicable:

SECTION 69. NR 110.20 (3) (c) is amended to read:

NR 110.20 (3) (c) *Equalization.* ~~Equalization~~ The design shall consider providing equalization facilities ~~shall be provided ahead of~~ that precede rotating biological contactors if the ratio of maximum hourly design flow to average design flow exceeds 2.5:1.

SECTION 70. NR 110.21 (intro.) is created to read:

NR 110.21 The owner of a sewage treatment facility that uses an activated sludge process, an engineer retained by the owner, or the owner's authorized representative shall ensure that the activated sludge process meets all of the following design requirements, as applicable:

SECTION 71. NR 110.21 (3) (b) and (e) and (4) (a) are amended to read:

NR 110.21 (3) (b) *Winter protection.* Activated sludge processes and aeration equipment ~~which~~ that are subject to freezing or icing shall be designed to minimize the degree of freezing and icing to ensure continuity of operation and performance. Insulation of the tanks shall be considered where necessary to protect against freezing or adverse process impacts due to heat loss.

(e) *Equalization.* Equalization chambers shall be ~~provided~~ considered when large daily fluctuations of influent flow or organic loading are expected to occur.

(4) (a) *Process design.* The size of aeration units for any particular adaptation of the activated sludge process shall be determined by pilot ~~plant~~ studies, or calculations based mainly

on solids retention time, food to microorganism (F/M) ratio and mixed liquor suspended solids (MLSS) levels. Other factors such as size of sewage treatment ~~plant~~ facility, diurnal load variations and degree of treatment required shall also be considered. In addition, temperature, pH bicarbonate hardness, and reactor dissolved oxygen shall be considered when designing for nitrification. The calculations used to determine the aeration capacity shall be included in the design report required by s. NR 110.15 (1). Designs based on mixed liquor suspended solids levels greater than 5,000 milligrams per liter will not be approved unless adequate data is submitted showing the aeration and settling systems are capable of supporting such levels.

SECTION 72. NR 110.21 Table 5 is amended to read:

Table 5

Process	**Solids Retention Time Days**	**F/M Ratio mg BOD $_5$/d/mg MLVSS[d]**	**Volumetric Loading[e] kg BOD /m^3/d (lbs. BOD /1000 ft^3/d)**	**MLSS[f] mg/1**
Conventional Plug Flow	3 - 15	0.2 - 0.5	0.6 (40)	1,000 - 3,000
Step Aeration or Complete Mix	3 - 10	0.2 - 0.5	0.6 (40)	1,000 - 3,500
~~Complete Mix~~		~~0.2 - 0.6~~	~~0.8 (50)~~	~~3,000 - 5,000~~
Single-Stage Nitrification	>10	0.1 - 0.2	0.3 (20)	2,000 - 5,000
Contact-Stabilization	5 - 10	0.2 - 0.6	0.8[a] (50)	1,000 - 3,000[b] 4,000 - 10,000[c]
Extended Aeration	>15	0.05 - 0.15	0.25 (15)	3,000 - 5,000
Sequencing Batch Reactor	15 - 30	0.05 - 0.1	0.25 (15)	2,000 - 5,000

~~footnotes:~~ ~~a) total aeration capacity~~

~~b) contact tank~~

~~c) reaeration tank~~

SECTION 73. NR 110.21 Table 5 table notes a to f are created to read:

[a] Total aeration capacity

[b] Contact tank

[c] Reaeration tank

[d] MLVSS is the mixed liquor volatile suspended solids content in the aeration tank.

[e] Organic volumetric loadings are based on the influent organic load to the aeration tank at design average BOD5.

[f] MLSS is the mixed liquor suspended solids content in the aeration tank.

SECTION 74. NR 110.21 (4) (d) 2., (5) (c) and (d), and (6) (a) 1. and (c) are amended to read:

NR 110.21 (4) (d) 2. Liquid depths in aeration tanks may not be less than 3 meters (10 feet). The department may allow liquid depths to exceed 9~~5~~ meters (~~16~~30 feet) on a case-by-case basis.

(5) (c) *Air supply to meet oxygen demands.* 1. The design of the aerator system to provide the oxygen requirements calculated in accordance with par. (b) shall be done using standard design equations for diffused and mechanical aeration systems. Calculations shall incorporate such factors as tank depth, alpha factor of the waste, beta factor of the waste, certified aerator oxygen transfer efficiency, minimum aeration tank dissolved oxygen concentration, critical wastewater temperature and altitude of the ~~wastewater~~ sewage treatment facility.

(d) *Mixing requirements.* The following minimum requirements shall be met to ~~insure~~ ensure adequate mixing of mixed liquor suspended solids.

(6) (a) 1. Multiple blowers shall be ~~provided~~ installed. The blowers shall be sized to meet the maximum air demand with the largest blower out of service. ~~The design shall also~~

~~provide for~~ The blowers shall be able to deliver a varying ~~the~~ volume of air ~~delivered~~ in proportion to the air demand of the ~~plant~~ sewage treatment facility.

(c) *Pure oxygen.* Where pure oxygen is proposed, the facility shall submit to the department supporting data from pilot ~~plant installations~~ studies or full-scale installations similar to the one proposed ~~shall be submitted~~ to justify the aerator loading rate and the amount and type of aeration capacity and equipment proposed.

SECTION 75. NR 110.21 (7) Table 6 is amended to read:

Table 6

	Minimum	Maximum
Conventional Plug Flow	15	75
Step aeration or Complete Mix	20	75
Contact stabilization	50	150
Extended aeration	50	200
~~Complete mix~~	~~20~~	~~75~~

SECTION 76. NR 110.21 (7) (b) 1. and (e) are amended to read:

NR 110.21 (7) (b) 1. If motor driven return sludge pumps are used, the ~~maximum~~ design return sludge capacity shall be met with the largest pump out of service. A positive head shall be provided on pump suctions. Pumps shall also have at least 7.6 centimeter (3-inch) suction and discharge openings.

(e) *Waste sludge pumps.* ~~Variable speed or multiple constant speed waste sludge~~Waste sludge pumps shall be ~~provided~~ installed. The maximum sludge pumping rate shall be at least ~~200%~~ 200 percent of the anticipated volumetric sludge production rate. Devices for measuring waste activated sludge flow rates shall be ~~provided~~ installed.

SECTION 77. NR 110.21 (8) to (10) are created to read:

(8) BIOLOGICAL NUTRIENT REMOVAL. (a) *General.* The department may approve biological nutrient removal processes on a case-by-case basis. The biological nutrient removal process shall meet all of the following requirements:

1. The process design shall be based on wastewater composition, type of biological nutrient removal treatment process, peak wastewater flow rates, actual nutrient loading relative to the plant design capacity excluding recycle flows, effluent permit requirements, presence of biological inhibitors or toxic constituents, initial low flow conditions, anticipated treatment efficiency, side stream recycle flows, internal recycle flows, chemical usage, process control and maintenance requirements, optimum operation for water quality protection, and other relevant factors. If appropriate, an external carbon source may be included in the organic loadings used for sewage treatment facility design.

2. The process design shall provide for flexibility in operation and if feasible, provide for operation in various biological nutrient removal modes.

(b) *Enhanced biological phosphorus removal.* A facility may use an enhanced biological phosphorus removal (EBPR) process if the design meets all of the following requirements:

1. A sufficient quantity of readily biodegradable organic matter is available in an anaerobic environment to promote the proliferation of phosphorus-accumulating organisms, which is indicated by the release of ortho-phosphate in the anaerobic zone of the EBPR process. The amount of readily biodegradable organic matter may be increased by fermentation of wastewater, sludge, or a fermentable supplemental carbon source, or by the addition of supplemental volatile fatty acids such as acetic acid.

2. The volume in the anaerobic zone shall be large enough to accommodate EBPR without switching off mechanical mixers. The design anaerobic mass fraction, which is the amount of sludge subjected to anaerobic conditions relative to the total mass of sludge in all of the biological nutrient removal reactor zones, shall not be less than 12 percent. Timers or variable frequency drives for mechanical mixers shall be installed for all sewage treatment facilities to allow for process optimization. Baffling may be used to maintain zone integrity and prevent any short-circuiting or back-mixing.

3. The dissolved oxygen and nitrate in upstream and recycle flows to the anaerobic contact tank shall be excluded to create anaerobic conditions.

4. The intermittent mixing in the mainstream anaerobic zone for settling and fermentation of MLSS or the alternative of a side-stream anaerobic fermentation tank for RAS may be provided where the readily biodegradable organic content in the influent wastewater is low.

5. The EBPR process sludge containing the excess accumulated phosphorous may be wasted, or the excess phosphorus may be removed and recovered from the waste sludge by a side-stream sludge treatment process. Chemical treatment may be needed as a back-up system or for effluent polishing to achieve very low effluent phosphorus levels.

(c) *Biological nitrogen removal.*

1. Nitrification may be achieved with a single-stage nitrification process that combine carbon oxidation and nitrification or with a separate-stage nitrification process. In addition to the permissible loadings specified under s. NR 110.21 (4) (b), temperature, alkalinity, pH, and dissolved oxygen shall be considered in nitrification process design.

2. For sewage treatment facilities subject to high wet weather flows, flexibility in design and operation to periodically aerate additional zones shall be provided as necessary to ensure that nitrification is consistently achieved and maintained. The facility may operate these zones in multiple modes such as anaerobic, anoxic, or aerobic conditions, depending on the operational strategy.

3. The facility shall provide a soluble, biodegradable organic carbon source to drive the denitrification process. The carbon requirements may be provided by influent wastewater, sludge fermentation, or an external source such as methanol, ethanol, acetate, or glycerin. For biological nitrogen removal processes that have both a pre-anoxic zone before the nitrification zone and a post-anoxic zone, denitrification in the post-anoxic zone is driven by either carbon from endogenous activity or an external carbon source that may be added to accelerate the denitrification rate in that zone.

4. An aerobic zone may follow the post-anoxic zone.

5. The anoxic zone of a biological nitrogen removal process may be divided into two or more cells, one of which can be equipped with both mixers and aerators designed to operate independently, to allow for operation in either anoxic or oxic mode as necessary.

6. The facility shall provide flexibility in operation to prevent fouling of aeration devices during extended periods of anoxic operation. Baffling may be provided to maintain zone integrity and prevent any short-circuiting and back-mixing.

(d) *Combined biological nitrogen and phosphorus removal.* Combinations of anaerobic, anoxic, and aerobic zones or compartments shall be designed to accomplish biological nitrogen and phosphorus removal, if applicable.

(e) *Monitoring.* The facility may provide monitoring equipment to routinely measure ortho-phosphate, nitrate, nitrite, dissolved oxygen, ammonia, and oxidation-reduction potential in all zones at appropriate locations.

(9) SEQUENCING BATCH REACTORS. (a) *General.* Sequencing batch reactors are a fill-and-draw mode of the activated sludge process and may be approved by the department on a case-by-case basis. The design of sequencing batch reactor systems may be based on experience at other sequencing batch reactor facilities. The facility shall provide continuity and reliability of treatment equal to the continuous flow-through modes of the activated sludge process. The design shall meet applicable effluent permit limits.

(b) *Design basis*. Design of sequencing batch reactor treatment equipment, reactors, and appurtenances shall meet all of the following requirements:

1. At least 2 tanks shall be installed.

2. The decantable volume and decanter capacity of the sequencing batch reactor system with the largest tank out of service shall be sized to pass at least 75 percent of the design maximum daily flow without changing cycle times.

3. MLSS and MLVSS concentrations and aeration tank organic volumetric loading as listed in s. NR 110.21 (4) (b) shall be calculated at the low-water level.

4. In the design of decanter weirs and approach velocities, the facility shall evaluate the instantaneous delivery of flow and system reliability when any single aeration tank unit is out of service.

5. Solids-excluding decanters shall be installed.

6. Scum removal shall be installed. An adequate zone of separation between the sludge blanket and the decanter shall be maintained throughout the decant phase.

7. Decanters that draw the treated effluent from near the water surface throughout the decant phase may be installed.

8. Solids management to accommodate tank dewatering shall be provided.

9. Aeration shall be provided in accordance with s. NR 110.21 (5) and (6).

10. Mechanical mixing independent of aeration shall be provided for all systems where EBPR or biological nitrogen removal is required. The mixing equipment shall be sized to thoroughly mix the entire tank from a settled condition within 5 minutes without aeration.

11. Continuous turbidity metering to separately monitor the effluent quality from each tank may be installed.

12. A fail-safe timer control shall be installed to ensure adequate settling between the react and decant phase.

13. A programmable logic controller shall be installed. Multiple programmable logic controllers may be installed to ensure rapid process recovery and minimize the deterioration of effluent quality from the failure of a single controller. An uninterruptible power supply with electrical surge protection shall be installed for each programmable logic controller to retain program memory throughout a power loss. A hard-wired back-up for manual override shall be provided in addition to automatic process control. Both automatic and manual controls shall allow independent operation of each tank.

(10) MEMBRANE BIOREACTORS. (a) *General.* The department may approve membrane bioreactors on a case-by-case basis. An immersed or non-immersed membrane system may be used.

(b) *Anoxic Tanks.* An anoxic zone may precede the membrane tank to promote either pre-anoxic denitrification or both pre-anoxic and post-anoxic denitrification, and to recover alkalinity that can help offset alkalinity consumption in the aerobic nitrification zone of the membrane bioreactor process.

(c) *Pretreatment.* 1. The facility shall provide pretreatment of wastewater by either micro-screening or fine screening upstream of any membrane bioreactor process that utilizes an immersed membrane system to prevent buildup of non-biodegradable matter in the membrane modules or integrated aeration devices. Fine screens shall consist of perforated openings of 3 millimeters (1/8 inch) or less for membrane bioreactors with flat-plate membrane systems and 2 millimeters (1/12 inch) or less for membrane bioreactors with hollow fibers.

2. Upstream grit removal shall be installed to protect membranes from abrasive components of raw wastewater and maintain membrane system integrity.

3. Upstream removal of fats, oils, and grease may be provided to prevent membrane surface fouling.

(d) *Sizing and number of units.* 1. Membrane bioreactor design shall be sufficient to permeate the design peak hourly flow through the membrane system, to prevent bypassing. Two or more membrane units shall be installed. Design flux shall be calculated based on the total membrane filtration surface area that is available when the largest membrane unit is out of service.

2. The facility shall consider elevated MLSS concentration and long solids retention times in sizing the aeration tanks.

3. When calculating aeration capacity, the facility shall consider the typical elevated MLSS concentration associated with membrane bioreactor process design and operation, as well as requirements for air scouring for immersed membrane systems.

4. Each membrane unit shall have a monitoring system in place to alert staff of membrane system failure.

(e) *Cleaning.* The facility shall provide appropriate cleaning methods.

SECTION 78. NR 110.22 (intro.) is created to read:

NR 110.22 The owner of a sewage treatment facility that uses physical or chemical treatment, an engineer retained by the owner, or the owner's authorized representative shall ensure that the physical or chemical treatment process meets all of the following design requirements, as applicable:

SECTION 79. NR 110.22 (2), (3) (c) 1. and 3., and (4) (a) 1. are amended to read:

NR 110.22 (2) DESIGN REPORT. ~~A design report shall be submitted~~ The municipality or engineer retained by the municipality shall submit a design report in accordance with s. NR ~~110.05~~ 110.15 (1). The report shall detail any lab testing, pilot ~~plant~~ studies or operating experience used to design the physical-chemical process.

(3) (c) 1. Addition of lime, or the salts of aluminum, ~~or~~ iron, or rare earth chlorides may be used for the chemical precipitation of soluble phosphorus.

3. Chemicals shall be mixed rapidly and thoroughly with the wastewater flow stream. Where separate mixing basins are provided, they shall be equipped with mixing devices. The detention time shall be at least 30 seconds and shall be based on the design peak hourly flow rate.

(4) (a) 1. Eye-wash fountains and safety showers using potable water shall be provided in the laboratory and on each floor level or work location where hazardous or corrosive chemicals are stored, mixed or slaked, pumped, metered, or unloaded. These fountains and showers shall be less than 7.6 meters (25 feet) from points of exposure to hazardous or corrosive chemicals and shall be fully ~~usable~~ operable during all weather conditions.

SECTION 80. NR 110.22 (4) (a) 1m. and 1m. (Note) are created to read:

NR 110.22 (4) (a) 1m. The department may approve portable eye-wash fountains and safety showers or drench hoses meeting ANSI/ISEA Z358.1-2014 (R2020), which is incorporated by reference, on a case-by-case basis provided the facility does not have potable water on site. The facility shall visually check self-contained fluids weekly in portable safety units to determine if flushing fluid needs to be changed or supplemented. The facility shall conduct its inspection in accordance with manufacturer's instructions.

Note: ISEA is the International Safety Equipment Association. ANSI/ISEA Z358.1-2014 (R2020) is available on websites of either ASTM (https://www.astm.org/) or ISEA (https://safetyequipment.org/), and at the office of the legislative reference bureau.

SECTION 81. NR 110.22 (4) (a) 2. and 3. are amended to read:

NR 110.22 (4) (a) 2. Eye-wash fountains shall be supplied with water ~~with a~~ of moderate temperature ~~not exceeding 38°C (100°F)~~ within 15 to 38 degrees Celsius (60 to 100 degrees Fahrenheit). This supply shall be separate from the hot water supply and be able to provide 15 to 30 minutes of continuous irrigation of the eyes.

3. Safety showers shall be capable of discharging ~~1.9 to 3.2~~ at least 1.3 liters per second (~~30 to 50~~20 gallons per minute) of water ~~with a~~ at moderate temperature not exceeding ~~38°C (100°F) temperature~~ 38 degrees Celsius (100 degrees Fahrenheit), and at pressures of ~~1.41 to 3.52 kilograms force per square centimeter~~ 205 to 345 kilopascals (~~20~~30 to 50 pounds per square inch).

SECTION 82. NR 110.22 (4) (a) 6. is created to read:

NR 110.22 (4) (a) 6. The department may require venting and ventilation on a case-by-case basis.

SECTION 83. NR 110.22 (4) (b) 2. is renumbered 2. (intro.) and amended to read:

NR 110.22 (4) (b) 2. ~~Chemical storage areas shall be enclosed by dikes or curbs which will~~ The facility shall provide secondary containment for areas that store hazardous or corrosive chemicals and that can contain at least 100 percent of the stored volume in case of a spill, until it can be either safely transferred to another storage area or released to the wastewater at a

controlled rate which will not damage the treatment facilities, inhibit the treatment processes, or contribute to stream pollution. Liquid polymer shall be similarly contained. Secondary containment shall meet all of the following criteria, as applicable:

SECTION 84. NR 110.22 (4) (b) 2. a. to f. are created to read:

NR 110.22 (4) (b) 2. a. A secondary containment structure shall be designed for the sole intention of chemical containment and shall be curbs or berms, a double-walled tank, a chemical containment pallet, or another approvable structure. Valves on discharge lines shall be located adjacent to the storage tank and within the secondary containment structure.

b. A secondary containment structure shall be constructed with materials that are impermeable to and compatible with the substance being stored.

c. A secondary containment structure shall implement leak detection. For secondary containment structures where visual leak detection is impractical, such as a double walled tank, continuous interstitial monitoring shall be provided.

d. A secondary containment structure shall be designed to allow removal of any spilled or leaked chemical in a timely manner.

e. A secondary containment structure shall be designed with auxiliary facilities within the containment area, including pumps and controls, that are located above the highest anticipated liquid level.

f. A secondary containment structure shall be designed with curb or berm containment areas that are sloped to a sump area and may not contain floor drains.

SECTION 85. NR 110.22 (4) (c) 4., (5) (b) 1., and (7) (f) 3. are amended to read:

NR 110.22 (4) (c) 4. Exposed pipes containing hazardous chemicals may not be located above shoulder level except where continuous drip collection trays and coupling guards, or piping providing secondary containment, will eliminate the spraying or dripping of these chemicals onto workers.

(5) (b) 1. Selection of type, size, and depth of filter media shall depend on the filtration rate, the type of treatment provided prior to filtration, filter configuration, available hydraulic head, and the desired effluent quality. All granular media shall have a uniformity coefficient of 1.7 or less.

(7) (f) 3. Buried sand filters shall be dosed by pumps or siphons. The dosing volume shall be equal to or greater than 90% of the volume of the distribution piping. The dosing system and distribution piping shall be sized to handle the average daily design flow.

SECTION 86. NR 110.22 (8) is created to read:

NR 110.22 (8) ALTERNATIVE FILTRATION. (a) *General.* The department shall evaluate alternative tertiary filtration technologies such as disc, cloth, or other membrane filtration on a case-by-case basis.

(b) *Design.* The municipality or its authorized engineer shall base its design on pilot studies or operating experience. The filtration technologies shall be sized to meet appropriate limits. These technologies shall be installed in accordance with manufacturer recommendations.

SECTION 87. NR 110.23 (intro.) is created to read:

NR 110.23 The owner of a sewage treatment facility that is required to disinfect, an engineer retained by the owner, or the owner's authorized representative shall ensure that the disinfection process meets all of the following design requirements, as applicable:

SECTION 88. NR 110.23 (1) (a) 2., (2) (g) 1. are amended to read:

NR 110.23 (1) (a) 2. Where a disinfection process other than chlorine is proposed, the sewage treatment facility shall submit supporting data from pilot ~~plant installations~~ studies or similar full-scale installations ~~shall be submitted~~ as a basis for the design of the system in accordance with s. NR 110.15 (1).

(2) (g) 1. Respiratory air-pack protection equipment~~,~~ meeting the requirements of the national institute for occupational safety and health shall be available where chlorine gas is

handled, and shall be stored at a convenient location. The equipment may not be stored inside any room in which chlorine is used and stored. The equipment shall use compressed air or oxygen, have at least a 30-minute capacity, and be compatible with the units used by the fire department having jurisdiction over the ~~plant~~ sewage treatment facility.

SECTION 89. NR 110.23 (3) is renumbered (3) (a).

***[Note to LRB:** The title for s. NR 110.23 (3), ULTRAVIOLET DISINFECTION., remains the title for sub. (3).]*

SECTION 90. NR 110.23 (3) (a) (title) and (b) to (h) are created to read:

NR 110.23 (3) (a) *General*.

(b) *Lamps.* UV disinfection system lamp types should be either low pressure-low intensity, low pressure-high intensity, or medium pressure-high intensity. The facility shall provide a mechanical or manual method for cleaning the tubes that contain the lamps and a proper means of disposal of spent UV lamps.

(c) *Design and hydraulics*. For open channel designs, modular UV disinfection units that can be removed from the flow are required. The facility shall install at least two independent banks in series, including control and electrical components, in each channel for disinfection reliability and to ensure uninterrupted service during tube cleaning or other required maintenance. The hydraulic properties of the system shall be designed to simulate plug flow conditions without short-circuiting under the full operational flow range. Water level control shall be provided to achieve the necessary exposure and ensure the lamps are submerged at all times.

(d) *Transmittance*. UV disinfection should be applied to a high-quality final effluent having at least 65 percent UV transmittance at 254 nanometers wavelength, and BOD_5 and TSS concentrations no greater than 30 mg/L. Final effluent with UV transmittance less than 65 percent or concentrations of BOD_5 or TSS greater than 30 mg/L may be approved with adequate justification and if adequate UV dose delivery will be provided.

(e) *Dosage*. The UV dosage shall be based on the design peak hourly flow. A design UV dosage of not less than 30 $(mW \cdot s)/cm^2$ should be used after adjustments for maximum tube fouling, lamp output reduction over time, and other energy absorption losses. Variability of the influent wastewater, for instance due to seasonal effects or industrial inputs, should also be considered in determining dosage.

(f) *Safety*. Measures to protect operator safety shall be considered, to prevent issues such as electrical hazards and exposure to UV radiation.

(g) *Alarm system*. An alarm system shall be provided that will separately indicate lamp failure, low UV intensity, any other cause of UV disinfection unit failure, and water levels that fall below the top of lamps.

(h) *Electrical controls*. A programmable logic controller or equivalent shall be used for UV disinfection system control. Multiple controllers should be provided as necessary to ensure rapid recovery and minimize the deterioration of effluent quality from the failure of a single controller. An uninterruptable power supply with electrical surge protection shall be provided for each controller to retain program memory throughout a power loss, including data such as the process control program, last known set-points, and measured process or equipment status. A hard-wired back-up for manual override shall be provided in addition to automatic process control. Both automatic and manual controls shall allow independent operation of each UV bank.

SECTION 91. NR 110.24 (intro.) is created to read:

NR 110.24 The owner of a sewage treatment facility that contains lagoons, an engineer retained by the owner, or the owner's authorized representative shall ensure that the lagoons meet all of the following design requirements, as applicable:

SECTION 92. NR 110.24 (2) (a) 3., (b) 1., (d) 3. and (4) (b) 1. and 2., (d) 1., 4., and 5. are amended to read:

NR 110.24 (2) (a) 3. In addition to the treatment volume calculated ~~in~~ under subd. 1. or 2., quiescent settling zone or cell shall be provided for aerated lagoon systems. Minimum

settling time shall be 6 days for a surface water discharge, and 3 days for a land ~~disposal~~ treatment discharge.

(b) 1. Stabilization ponds may be used to treat domestic wastewater. Combined domestic and industrial wastewater may be treated in stabilization ponds only if the treatability of the industrial wastewater is demonstrated through a pilot ~~testing~~ study.

(d) 3. Soil sampling shall be performed in accordance with ~~ASTM D1586-08a~~ ASTM D1586-18e1 or ASTM D1587-08, which are incorporated by reference.

(4) (b) 1. Loss of water from ~~wastewater~~ sewage treatment or storage lagoons may not exceed 10 cubic meters per water surface hectare (1,000 gallons per acre) per day and loss of water from sludge storage or treatment lagoons or other sludge handling facilities may not exceed 5 cubic meters per sludge surface hectare (500 gallons per acre) per day.

2. In circumstances where soil or groundwater characteristics, groundwater quality, or waste characteristics warrant, the department may require exfiltration rates less than 10 cubic meters per water surface hectare (1,000 gallons per acre) per day for ~~wastewater~~ sewage treatment or storage lagoons.

(d) 1. Core samples taken to determine soil texture, grain size distribution or permeability shall be taken in accordance with ~~ASTM D1586-08a~~ ASTM D1586-18e1, ASTM D1587-08, or ASTM 3550-01 (2007), which are incorporated by reference.

4. Plasticity index shall be determined in accordance with ~~ASTM D4318-10~~ ASTM D4318-17e1, which is incorporated by reference.

5. Standard procter densities shall be determined in accordance with ~~ASTM D698-07 e1~~ ASTM D698-12 (2021), which is incorporated by reference.

SECTION 93. NR 110.24 Table 7 is repealed and recreated to read:

*[**Note to LRB:** Only the title, headers, and borders for Table 7 are changing, to provide greater clarity.]*

Table 7

Minimum liner thickness in centimeters (inches), given lagoon water depth and liner coefficient of permeability

	Lagoon Water Depth, meters (feet)			
Liner Coefficient of Permeability cm/sec (ft/day)	**1.8 (6)**	**3 (10)**	**3.8 (12)**	**4.6 (15)**
1×10^{-7} (2.83×10^{-4})	22 cm (9 in)	33 cm (13 in)	40 cm (16 in)	48 cm (19 in)
5×10^{-8} (1.42×10^{-4})	14 (6)	19 (8)	23 (8)	27 (11)
1×10^{-8} (2.83×10^{-5})	10 (4)	10 (4)	10 (4)	10 (4)
5×10^{-9} (1.42×10^{-5})	10 (4)	10 (4)	10 (4)	10 (4)
1×10^{-9} (2.83×10^{-6})	10 (4)	10 (4)	10 (4)	10 (4)

SECTION 94. NR 110.25 (title) is amended to read:

NR 110.25 General conditions required for all land ~~disposal~~ treatment systems.

SECTION 95. NR 110.25 (intro.) is repealed.

SECTION 96. NR 110.25 (1) is amended to read:

NR 110.25 (1) APPLICABILITY. Land ~~disposal~~ treatment systems shall be reviewed and approved on a case-by-case basis. The requirements of this section apply to municipally-owned or privately-owned domestic sewage treatment facilities which meet the definition of land treatment systems in s. NR 206.03.

SECTION 97. NR 110.25 (1) (Note) is created to read:

NR 110.25 (1) Note: Section NR 206.03 (16) defines 'land disposal system'. For the purposes of the applicability of these requirements, a 'land disposal system' and a 'land treatment system' are interchangeable terms.

SECTION 98. NR 110.25 (3), (3m), (4) (a) 3., (c) 1. and 2., and (e) to (g), and (5) (a) (Note), (b) 1. to 3., and (c) (intro.), 1. a. and b. are amended to read:

NR 110.25 (3) TREATMENT PRIOR TO DISPOSAL. All discharges to land ~~disposal~~ treatment systems shall receive biological, chemical, physical, or a combination of treatments necessary to meet effluent standards ~~in~~ under ch. NR 206 and groundwater quality standards ~~in~~ under ch. NR 140, as approved by the department. Industrial waste discharges tributary to the municipal system shall be in compliance with applicable pretreatment standards under s. NR 211.30.

(3m) MANAGEMENT PLAN. (a) A management plan shall be submitted to the department with plans and specifications for all land ~~disposal~~ treatment facilities.

(4) (a) 3. Multiple wastewater application areas shall be provided to allow load and rest cycles. The discharge shall be alternately distributed to individual cells of the disposal system in a manner to allow sufficient resting periods to maintain the absorptive capacity of the soil, and to allow soil conditions to become unsaturated and aerobic between loadings. This requirement does not apply to a subsurface soil absorption system or mound system.

(c) 1. Land ~~disposal~~ treatment systems shall be separated from private water supply wells by a minimum horizontal distance of 76 meters (250 feet). This requirement does not apply to a small subsurface soil absorption system or mound system. A small subsurface soil absorption system or mound system shall meet the separation distance requirements in ch. NR 812.

2. The minimum horizontal separation distance between a land ~~disposal~~ treatment system and public water supply wells shall be determined during facilities planning in accordance with s. NR 110.09 (2) (p). In all cases the department recommends that a minimum horizontal separation of 305 meters (1,000 feet) be maintained.

(e) *Storage lagoons.* Storage lagoons shall be provided for all land ~~disposal~~ treatment systems ~~which~~ that are adversely affected by winter conditions or wet weather. Storage lagoons shall be constructed in accordance with s. NR 110.24 (3) and (4). This requirement does not apply to a subsurface soil absorption system or mound system.

(f) *Load and rest cycles.* Load and rest cycles for each system shall be determined based on hydrogeologic and other relevant site conditions such as soil permeability, texture, cation-exchange capacity, topography, depth to groundwater and bedrock and the wastewater characteristics. This requirement does not apply to a subsurface soil absorption system or mound system.

(g) *Construction precautions.* 1. All precautions shall be taken during construction of a land ~~disposal~~ treatment system to minimize compaction of absorption areas and to prevent reduction in soil infiltration rate. Project specifications shall detail the specific precautions to take, which may include ~~no heavy equipment use and~~ erosion control on berms and limitations concerning the heavy equipment use.

2. Erosion control measures shall be practiced during the construction of the land ~~disposal~~ treatment system to avoid erosion of soil into a surface water and into or from the land ~~disposal~~ treatment system.

(5) (a) **Note:** The skills and knowledge required of a hydrogeologist making submittals under this chapter include: the ability to apply hydrogeologic principles and practices to the siting, design, and operation of land ~~disposal~~ treatment systems; knowledge of contaminants associated with land ~~disposal~~ treatment of wastewater, their transport mechanisms and fate in the environment; familiarity with environmental monitoring practices, sampling techniques, and groundwater standards; and proficiency in the design of groundwater monitoring systems for defining the physical and chemical characteristics of groundwater flow. A soil scientist or other environmental scientist who can demonstrate the above skills and knowledge, as reflected in submittals made under this chapter, shall be deemed a “qualified person".

(b) 1. A minimum of 3 monitoring wells per land ~~disposal~~ treatment system shall be installed to monitor groundwater quality in accordance with s. NR 206.10 (2), to determine flow directions and ~~for a~~ flow rate ~~determination~~. At a minimum, one well will be upgradient and one well downgradient of the land ~~disposal~~ treatment system.

2. One or more upgradient monitoring wells shall be installed at locations and depths sufficient to yield groundwater samples that are representative of background water quality near the facility. Selection of well locations should take into account past and present land uses

which might affect groundwater quality. The upgradient well should be located so it will not be affected by the land ~~disposal~~ treatment system. Any upgradient wells should be located at the most distant point ~~of~~ upgradient of the application area, and not closer ~~that~~ than 75 feet from the application area. If the well is located beyond the property boundary, an easement for access shall be obtained prior to installation of the well.

3. Downgradient wells shall be located so as to intercept any groundwater impacted by the land ~~disposal~~ treatment system, considering the vertical and horizontal gradients of flow. The wells shall be no closer than 30 feet for rapid infiltration systems, and at a minimum, one well shall be located between the application area and the design management zone (DMZ) or property boundary. It is recommended that one well be located at or beyond the DMZ or property boundary. If the well is located beyond the property boundary, an easement for access shall be obtained prior to installation of a well.

(c) *Monitoring well construction.* All groundwater monitoring wells shall be constructed in accordance with ch. NR 141 and ~~this section.~~ all of the following:

1. a. For piezometers, inlet screens shall ~~have a length of at least 2.5 feet but~~ not be more than 5 feet in length unless otherwise approved by the department.

b. For water table observation wells, inlet screens shall not exceed ~~10~~ 15 feet in length.

SECTION 99. NR 110.255 (title), (1) (a) 1., 9., and 10. c., (2) (a) 1., and (3) (a) 2. and 15. are amended to read:

NR 110.255 Conditions required for specific types of land ~~disposal~~ treatment systems.

(1) (a) 1. New absorption pond systems shall consist of a minimum of 3 individual absorption ponds of approximately equal size. Absorption pond systems consisting of ~~1 or 2 individual~~ fewer than 3 ponds may be approved by the department on a case-by-case basis if it is demonstrated that the system has effluent storage capabilities or other provisions to ensure the operation of the system in accordance with the load and rest cycles determined under s. NR 110.25 (4) (f).

9. The bottom of the absorption pond may not be closer ~~that~~ than 5 feet to the highest anticipated groundwater elevation.

10. c. Soil pH may not be less ~~that~~ than 6.5.

(2) (a) 1. All spray irrigation systems shall be designed with a ~~wastewater~~ distribution system capable of loading and resting various portions of the site to optimize ~~wastewater~~ sewage treatment within the soil and crop growth.

(3) (a) 2. A ridge and furrow system may not be constructed on a site at which less ~~that~~ than 50% of the soil particles pass a ~~no.~~ number 200 sieve. Coarser textured soils may be approved on a case-by-case basis depending on system design and wastewater strength. Suitable soils shall extend at least 3 feet below the base grade of the furrow bottoms.

15. The ridges shall be seeded with perennial grasses which are suited to wet soil conditions. A nurse crop shall be used to seed new or modified systems. In addition, the grass cover shall be established to at least a 2-inch length before the system is used for ~~wastewater~~ sewage treatment.

SECTION 100. NR 110.255 (5) to (7) are created to read:

NR 110.255 (5) CONSTRUCTED WETLANDS. The department may approve constructed wetlands as a land treatment system provided the design is consistent with published engineering design guidance.

Note: Acceptable engineering design guidance for constructed wetlands includes U.S. Environmental Protection Agency, “Manual: Constructed Wetlands Treatment of Municipal Wastewater,” EPA/625/R-99/010; and U.S. Department of Agriculture, Natural Resource Conservation Service, National Engineering Handbook, Part 637, Chapter 3, Constructed Wetlands.

(6) SUBSURFACE SOIL ABSORPTION SYSTEMS. Subsurface soil absorption systems reviewed by the department in accordance with the requirements of this chapter shall be designed in accordance with the applicable requirements of s. NR 206.07 and ch. SPS 383.

(7) ALTERNATIVE LAND TREATMENT SYSTEMS. The department may approve an alternative land treatment system on a case-by-case basis.

SECTION 101. NR 110.26 (2) (e) 1. and 2. are amended to read:

NR 110.26 (2) (e) 1. The construction of sludge storage facilities shall be required to improve sludge handling capabilities, provide flexibility in operations, and to avoid environmental or public health hazards due to improper disposal techniques. This requirement applies when sewage sludge is mixed with other wastes including septage and industrial wastes.

2. Construction of these facilities will depend upon sewage treatment ~~plant~~ facility capabilities, land availability, surface and groundwater protection, health factors, municipal sludge management capabilities, and other environmental factors.

SECTION 102. NR 110.26 (2) (f) is created to read:

NR 110.26 (2) (f) *Odor.* Odor control shall be evaluated during design of sludge handling, storage, and disposal facilities.

SECTION 103. NR 110.26 (3) (b) is amended to read:

NR 110.26 (3) (b) *Ventilation.* All enclosures ~~which~~ that are connected with sludge digestors, or ~~which~~ that contain sludge or gas piping or equipment shall be provided with forced ventilation in accordance with s. NR 110.14 (3) ~~(b)~~ (c) 4. and 5. The piping gallery for digesters may not be connected to other passages unless a tightly fitting self-closing door is provided at connecting passageways. Ventilation systems shall also meet the requirements of NFPA 820-24, including that mechanical ventilation shall be provided by both supply and exhaust fans except for covered spaces not routinely entered by personnel and small aboveground buildings and structures, including domes and covers, with a floor or surface of 9.3 square meters (100 square feet) or less that are physically separated from other buildings or structures and do not present a fire hazard to other buildings or structures.

SECTION 104. NR 110.26 (3) (cm) and (4) (b) 6. are created to read:

NR 110.26 (3) (cm) *Fire protection.* Sludge facilities shall meet the fire protection and explosion hazard requirements of NFPA820-24.

(4) (b) 6. The department may approve alternative piping, including sizing and material, a case-by-case basis. All supporting use of alternative piping shall be included in the design report.

SECTION 105. NR 110.26 (5) (a) 2., (b) 1. a. and b., (c), and (d) 3. and 6. are amended to read:

NR 110.26 (5) (a) 2. ~~Multiple~~ At least one sludge ~~inlets~~inlet and ~~draw-offs~~ one draw-off shall be provided. Multiple recirculation suction and discharge points to facilitate flexible operations and effective mixing of the digester contents shall be provided unless adequate mixing facilities are provided within the digester. One sludge inlet shall discharge above the liquid level and be located at approximately the center of the tank to assist in scum breakup. Raw sludge inlet discharge points shall be so located as to minimize short circuiting to the supernatant draw-off. Sludge withdrawal for disposal shall be from the bottom of the tank. The pipe shall be interconnected with the recirculation piping to increase flexibility in mixing tank contents.

(b) 1. a. A minimum detention time of 15 days at design flows, when a temperature of 35 degrees Celsius (95 degrees Fahrenheit) or higher is maintained, shall be provided~~;~~.

b. Completely mixed digestion systems shall provide for intimate and effective mixing to prevent stratification and to assure homogeneity of digester content. The maximum system loading shall be ~~1.28~~ 1.6 kilograms per cubic meter per day (~~80~~ 100 pounds of volatile solids per 1,000 cubic feet of volume per day) in the digester~~;~~.

(c) *Temperature.* Heating equipment shall have the ability to maintain digestion temperature in the range of ~~33° to 38°C~~ 29 to 38 degrees Celsius ~~(90° to 100°F~~) (85 to 100 degrees Fahrenheit) where optimum mesophilic digestion is required, or 50 to 60 degrees Celsius (122 to 140 degrees Fahrenheit) for optimum thermophilic digestion.

(d) 3. The diameter of gas piping shall be based on the volume of gas which will be generated and shall be 100 mm (4 inches) or greater in diameter. Gas piping shall slope to condensate traps. The use of float-controlled condensate traps is prohibited.

6. Waste gas burners shall be readily accessible and shall be located at least 7.6 meters (25 feet) away from any ~~plant~~ sewage treatment facility structure if placed at ground level. Waste gas burners may be located on the roof of the control building if sufficiently removed from the tank. All waste gas burners shall be equipped with automatic ignition, such as a pilot light or a device using a photoelectric cell sensor. Consideration should be given to the use of natural or propane gas to insure reliability of the pilot light. If the waste gas burner is in a remote location, the department may approve the discharge of gas to the atmosphere through a return-bend screened vent terminating at least 3 meters (10 feet) above the walking surface, provided the assembly incorporates a flame trap.

SECTION 106. NR 110.26 (5) (g) is created to read:

NR 110.26 (5) (g) *Alternative anaerobic digestion.* The department may approve alternative anaerobic digestion systems on a case-by-case basis.

SECTION 107. NR 110.26 (6) (b) 1. is amended to read:

NR 110.26 (6) (b) 1. Aeration systems shall be capable of maintaining a ~~minimum~~ digester dissolved oxygen concentration ~~milligram~~between one and two milligrams per liter.

SECTION 108. NR 110.26 (6) (c) 1. is repealed and recreated to read:

NR 110.26 (6) (c) 1. Aerobic digesters shall be provided with mixing equipment that can maintain solids in suspension and ensure complete mixing of the digester contents.

SECTION 109. NR 110.26 (6) (c) 2. is amended to read:

NR 110.26 (6) (c) 2. Diffused aeration systems shall be capable of delivering a minimum air flow rate of 30 cubic meters per minute per 1,000 cubic meters (30 cubic feet per minute per 1,000 cubic feet) of active digester volume with the largest blower out of service.

SECTION 110. NR 110.26 (6) (c) 4. and (f) are created to read:

NR 110.26 (6) (c) 4. The department may approve submersible mixing equipment as an alternative or supplemental method for mixing on a case-by-case basis.

(f) *Alternative aerobic digestion.* The department may approve alternative aerobic digestion systems on a case-by-case basis.

SECTION 111. NR 110.26 (7) (c) is amended to read:

NR 110.26 (7) (c) *Other methods.* Other methods or operating conditions may be acceptable for sludge stabilization, pathogen control, and vector attraction reduction if pathogens and volatile solids are reduced to an extent equivalent to anaerobic digestion.

SECTION 112. NR 110.26 (7) (c) (Note) is created to read:

NR 110.26 (7) (c) **Note:** Design considerations for sludge stabilization processes including pathogen control and vector reduction are contained in ch. NR 204.

SECTION 113. NR 110.26 (8) (c) 1. and 2. and (10) (a) are amended to read:

NR 110.26 (8) (c) 1. 'General.' Provision shall be made to maintain sufficient continuity of service so that sludge may be dewatered without accumulation beyond storage capacity. Design calculations or a pilot ~~plant data~~ study shall be submitted to justify the basis of design and equipment.

2. ~~The capacity of vacuum filters, centrifuges, filter presses, belt filters or other mechanical dewatering facilities~~ Mechanical dewatering equipment, such as vacuum filters, centrifuges, filter presses, rotary presses, screw presses, belt filters, or combinations thereof, shall be sufficient to dewater the sludge produced ~~with the largest unit out of service~~.

(10) (a) *General.* Sludge storage shall be provided by facilities in accordance with ch. NR 204. A detailed description of the ~~wastewater~~ sewage treatment process and design data shall accompany the plans for the proposed storage facility. Sludge storage facilities shall be designated and operated to maintain compliance with the groundwater quality standards in ch. NR 140. In the event a sludge storage facility is temporary, it shall be abandoned in such a manner so as to prevent safety, environmental and aesthetic problems from occurring. The

department shall be notified in writing if the storage facility is to be abandoned and how abandonment will be accomplished.

SECTION 114. NR 110.26 (10) (a) (Note) is created to read:

NR 110.26 (10) (a) **Note:** Section NR 113.12 details the septage-only storage requirements for implementing a ch. NR 110 plan and specification submittal for department review.

SECTION 115. NR 110.26 (10) (b) 1. is amended to read:

NR 110.26 (10) (b) 1. Except if a lesser separation distance is approved by the department on a case-by-case basis provided the sludge is adequately dried and stored offsite, sludge storage facilities may not be located within the following distances of a water supply well~~.~~:

a. ~~1000~~1,000 feet from a community public water supply well~~;~~.

b. 250 feet from a private water supply well~~;~~.

SECTION 116. NR 110.26 (10) (d) 5. and 5. (Note) and (h) are created to read:

NR 110.26 (10) (d) 5. Above ground sludge storage facilities shall be equipped with a high-water alarm.

Note: The department considers the installation of a high-water alarm to be a modification and is a reviewable project under s. NR 110.03 (27).

(h) *Temporary storage.* The department may approve temporary sludge storage on a case-by-case basis. Temporary storage is intended for no more than 180 days of use.

SECTION 117. NR 110.26 (11) (a) 1. is amended to read:

NR 110.26 (11) (a) 1. Liquid sludge shall be transported in an enclosed watertight unit from sewage treatment ~~plant~~ facility to disposal site.

SECTION 118. NR 110.27 is repealed.

SECTION 119. NR 110.28 is created to read:

NR 110.28 Septage receiving at sewage treatment facilities. A sewage treatment facility that accepts septage shall provide adequate facilities for the receiving and treatment of septage, and shall meet all of the following requirements:

Note: This section is intended to help implement s. 281.49, Stats.

(1) REQUIREMENT TO RECEIVE AND TREAT SEPTAGE. (a) Except as allowed under par. (b), a sewage treatment facility that receives septage shall receive and treat septage from November 15 to April 15. The sewage treatment facility may, but is not required to, also receive and treat septage at other times during the year.

Note: Section 281.49 (2), Stats., contains the statutory requirement for septage acceptance and treatment.

(b) A sewage treatment facility is not required to receive and treat septage if it would cause the sewage treatment facility to exceed its operating design capacity or to violate any applicable effluent limitations or standards, water quality standards, or any other legally applicable requirements; or if the septage is not compatible with the sewage treatment facility.

Note: See s. 281.49 (3), Stats., for the full exceptions to the requirement to receive and treat septage.

(c) Written justification from the sewage treatment facility should be provided to the department and the septage business if the sewage treatment facility chooses not to receive septage. This requirement may not apply to specific types of sewage treatment systems such as a recirculating sand filter.

(2) GENERAL CONSIDERATIONS. Septage is normally considered treatable at sewage treatment facilities but could constitute shock loading or have other adverse impacts on treatment processes and effluent quality. A sewage treatment facility shall consider all of the following factors prior to receiving septage at a sewage treatment facility:

(a) The treatment facility capacity relative to the amount and rate of septage to be received.

(b) The unused treatment facility capacity available to treat septage flows and loadings.

(c) The sensitivity of the treatment process to daily fluctuations in loadings that may result from the addition of septage.

(d) The septage loadings of BOD, ammonia nitrogen, or phosphorus that may cause process upset, odor nuisance, aeration tank or aerated digester foaming, or pass-through to the effluent.

(e) The point of introduction of septage into the treatment process. Pathogen control and vector attraction reduction considerations shall be considered with alternative points of feed to the sewage treatment process. Feasible alternative points of feed to the treatment units shall be evaluated including feed to the sludge processing units, provided the treatment unit function will not be adversely affected.

(f) The ability to control feed rates of septage to the treatment process during off-peak loading periods.

(g) The volume and concentrations of bacterial growth inhibitors in septage from portable restrooms and recreational dump station holding tanks.

Note: A portable restroom is defined in s. NR 113.03 (41).

(h) The sewage treatment facility's permitted effluent limits.

(3) FACILITIES PLANNING FOR RECEIVING SEPTAGE.

(a) Prior to receiving septage at a sewage treatment facility, a sewage treatment facility shall make an adequate evaluation of the existing facility for the anticipated septage loading.

(b) Facilities plans should include anticipated septage loading when addressing sewage treatment facilities sizing and process selection. A sewage treatment facility shall include the following factors, as applicable, in facilities plans that consider septage receiving stations:

1. A determination that the addition of septage to the sewage treatment facility shall not result in the sewage treatment facility exceeding its rated design capacity or its permitted effluent limitations.

2. A consideration of the sewage treatment facility design capacity relative to the septage loading.

Note: In general, the smaller the sewage treatment facility design capacity relative to the septage loading, the more susceptible the sewage treatment facility will be to upset and potential violation of permitted discharge effluent limits.

3. The allocation of sewage treatment facility waste load capacity originally planned for future growth.

4. For sewage treatment facilities proposed to be expanded or upgraded, the sensitivity of the treatment process to receiving septage and the impact on discharge parameter limits should be jointly considered. The evaluation should consider potential impacts to the sewage treatment facility's nitrification process, if applicable.

5. An evaluation of available sewage treatment facility operating personnel and the staffing requirements necessary when septage is to be received. Sewage treatment facility staff shall have a means of recording when septage is received and unloaded to record the date, time, volume, waste description, and hauler name. Added laboratory work associated with receiving septage for treatment shall be included in the staffing and laboratory facilities evaluation.

6. The area for constructing septage receiving facilities that are to be off-line from the raw wastewater from the sewer system. Other sewage treatment facility activity and traffic flow should be considered when locating the septage receiving facility and the septage hauler unloading area.

7. The impact of the septage handling and treatment on the sewage treatment facility sludge handling and processing units and ultimate sludge disposal procedures.

(4) SEPTAGE RECEIVING STATIONS. A sewage treatment facility shall provide for the following elements in the design of septage receiving stations at a sewage treatment facility:

(a) A hard-surface haul-truck unloading ramp sloped to a drain to allow ready cleaning of any spillage and washing of the haul-truck's connector hoses and fittings. The ramp drainage shall be tributary to the sewage treatment facilities and shall exclude excessive stormwater. If using a trench drain, the drain shall be screened to prevent debris from clogging piping and tankage.

(b) A flexible hose fitted with easy-connect coupling to provide for direct connection from the haul-truck outlet to the septage receiving tank or sewage treatment facility to minimize spillage and help control odors. Gravity drainage during truck unloading is recommended to prevent potential hose failure.

(c) Washdown water with ample pressure, hose, and spray nozzle for convenient cleaning of the septage receiving facility and haul-trucks. Washdown water shall meet the following requirements, as applicable:

1. The use of treated effluent may be considered for this purpose. If treated effluent is used, the treated effluent shall be disinfected and the septage receiving station shall have an appropriate warning sign.

2. If a potable water source is used, it shall be protected with appropriate backflow prevention and cross-connection control devices.

3. Washdown water equipment shall be freeze protected.

(d) An adequate off-line septage receiving tank designed to provide complete draining and cleaning by means of a sloped bottom equipped with a drain sump. The design shall ensure adequate mixing for testing, uniformity of septage strength, chemical addition if necessary, and odor control. The design shall provide a means to collect a representative sample of any truckload of waste accepted for discharge to prevent or stop any disposal that is likely to cause adverse impacts to the sewage treatment facility.

(e) Screening, grit, and grease removal of the septage as appropriate to protect the treatment units.

(f) The design shall consider other types of hauled waste that may be received at the septage receiving station.

SECTION 120. EFFECTIVE DATE. This rule takes effect on the first day of the month following publication in the Wisconsin Administrative Register as provided in s. 227.22 (2) (intro.), Stats. OR This rule shall take effect on [DATE].

SECTION 121. BOARD ADOPTION. This rule was approved and adopted by the State of Wisconsin Natural Resources Board on [DATE].

Dated at Madison, Wisconsin _____

State of Wisconsin

Department of Natural Resources

BY _____

Steven Little, Deputy Secretary

For Karen Hyun, Ph.D., Secretary