



Supplementary Rules and Regulations for the Disposal of Sanitary Sewage

January 21, 2020

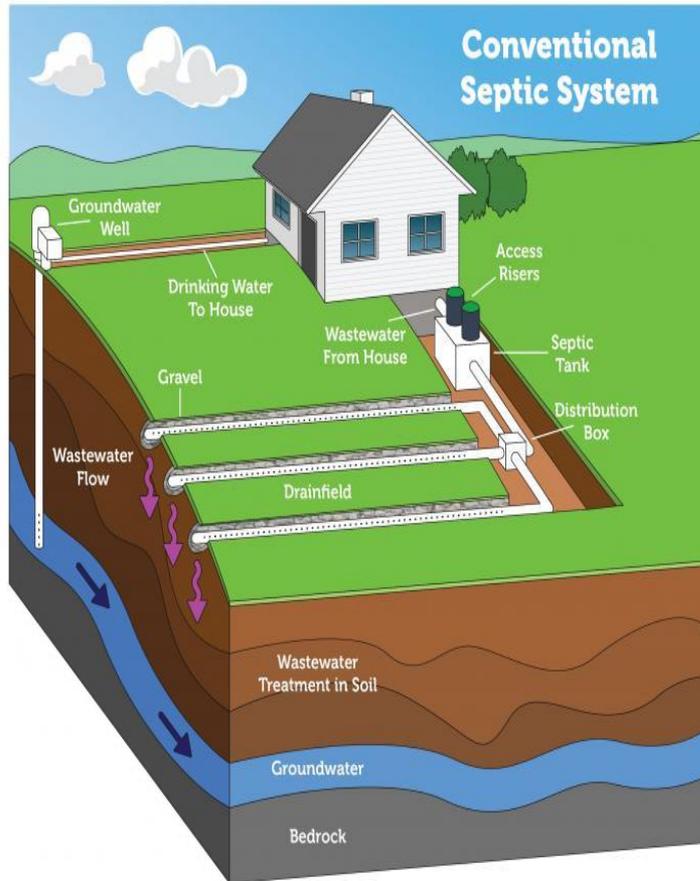
Hingham Board of Health

Elizabeth Eldredge, M.D. - Chair

Peter Bickford

Kirk Shilts, D.C.

Supplementary Rules and Regulations



Please note: Septic systems vary. Diagram is not to scale.

- Supplementary Rules and Regulations bring clarity to Title 5 (310 CMR 15.000)
- Revisions take into account local conditions unique to Hingham
- Current regulations last updated in 1998
- Four significant changes are being proposed



Proposed New Requirements

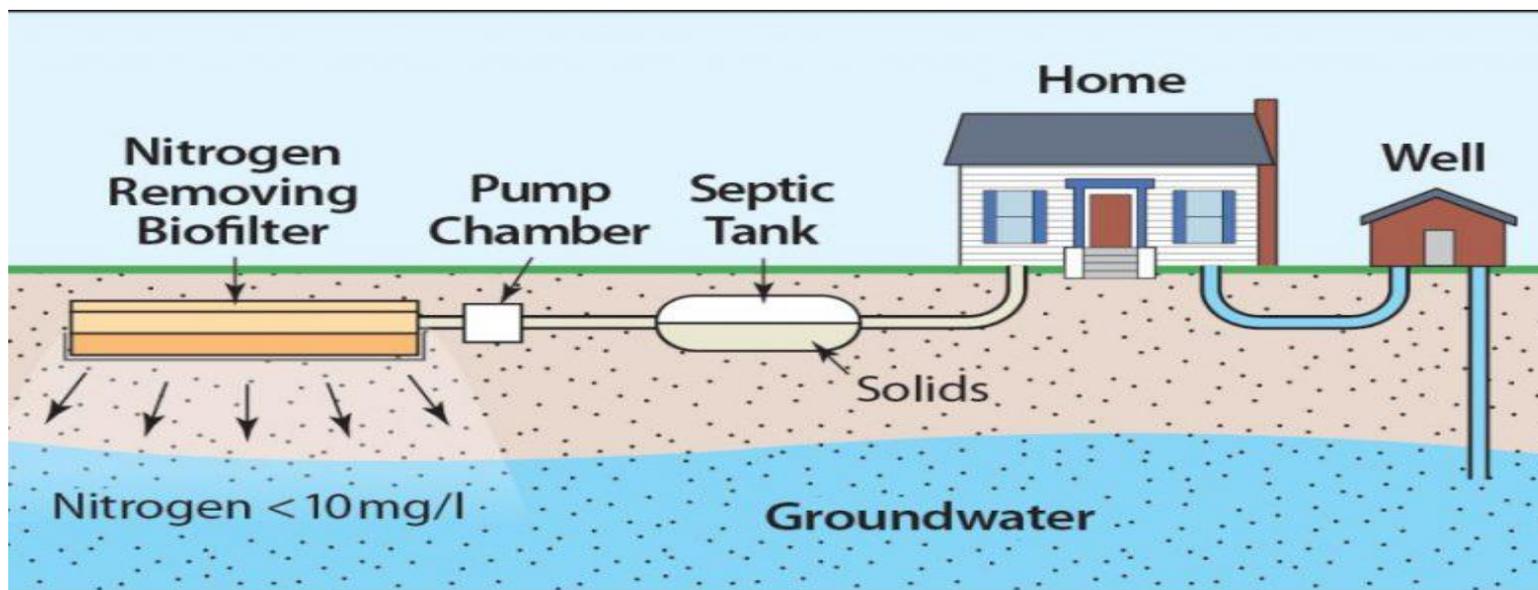
1. A new limit for **discharging nitrogen** on a lot within a Zone II water supply protection area or designated area served by private wells
2. A new **Financial Assurance Mechanism (FAM)** requirement and administrative process for innovative/alternative treatment plant systems
3. A new **lot division requirement** that clearly defines how a parcel of property is divided to ensure the septic system serving the original undivided lot will not be put into non-compliance with septic regulations
4. A new section that clearly defines homeowners understand their septic system via a **Title 5 inspection** when adding an **Accessory Dwelling Unit** (bedroom) to the dwelling, or installation of a **new potable well** for domestic water use, or with **sizeable home renovations on small lots** of 25,000 square feet or less



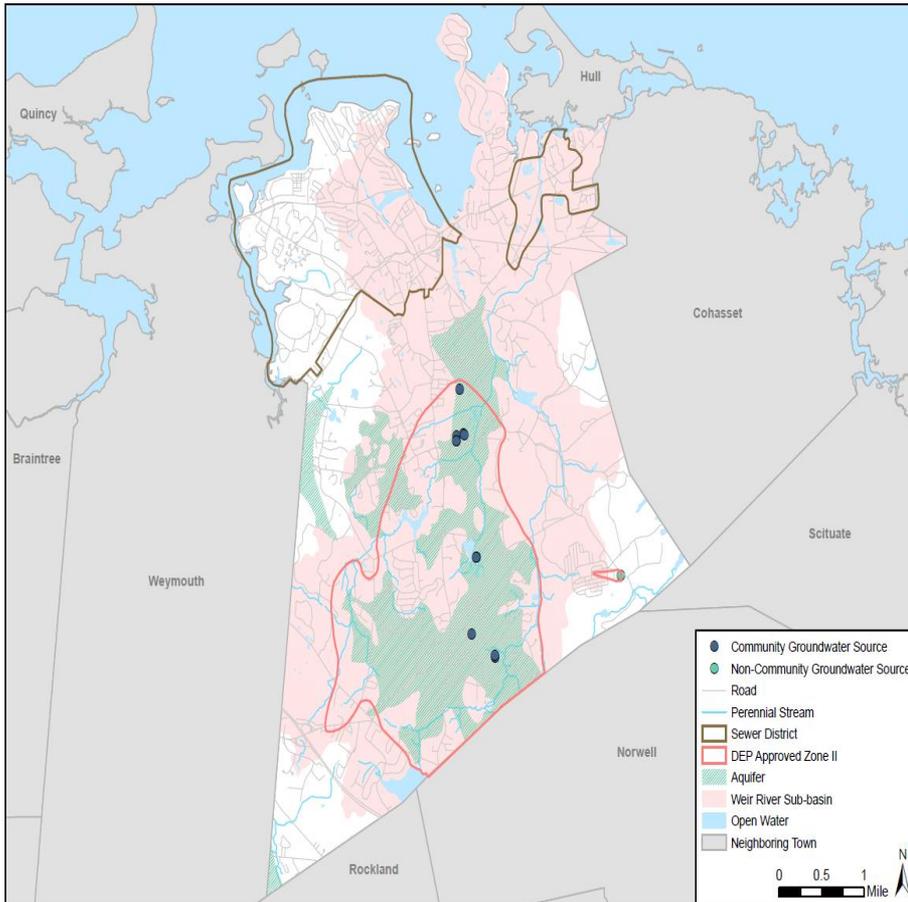
Nitrogen Load Requirement in Zone II

A defined limit on nitrogen load for properties within a Zone II water supply protection area or area served by private wells.

Nitrogen load is determined by impervious areas (roof + pavement), lawn areas (fertilizer), rainfall (recharge), as well as the number of bedrooms (septic).



Zone II Water Supply Protection Area



Weir River Watershed is our drinking water aquifer (*pink region*)

Zone II is the area of an aquifer which contributes groundwater to water supply wells under severe pumping and recharge conditions

Hingham's Zone II is located in central and southern Hingham, which encompasses nearly 1/3 of the town (*red circle*)

The two Hingham sewer districts encompass about 1/3 of the town (*brown circles*)

Aqueous Nitrogen



Nitrogen increases the growth of algae and decreases the levels of oxygen in water.

Nitrogen is not totally removed in the groundwater by chemical reactions; concentrations can only be lowered by dilution or limiting the nitrogen introduced to the ground.



Aqueous Nitrogen

- **Nitrogen** cannot be filtered from drinking water.
- Excessive **nitrogen** in drinking water (baby formula mixes) can cause “Blue Baby Syndrome”.
- **Nitrogen** builds up in groundwater over time; diluted by rain.
- Septic systems are the leading cause of introduced **nitrogen** to the environment.
- Ways to reduce **nitrogen** loading on your property:
 - Use Innovative/Alternative septic system technology
 - Reduce impervious areas (hardscapes)
 - Reduce fertilizer application (lawns)

Nitrogen Loading Calculation



Lot's Nitrogen Load (mg/liters) =

Nitrogen Concentration(mg): **# Bedrooms** (fecal septic/person)
+ Impervious area (roof area + paved area) **+ Added fertilizer**
(lawn area)

Wastewater & Recharge Volumes (l): **# Bedrooms** (septic flows)
+ Impervious runoff (roof + paving) **+ Rainwater recharge**
(natural area)

** Note: Title 5 defines 2-persons per bedroom*



Nitrogen Load Calculation

Examples:

Bedrooms = **Three (3)**

Lot Size = 1 Acre (43,560 sq. ft.)

Lawn Area = 14,000 sq. ft. (*Av. Lawn area per acre*)

Impervious area = (3,100 sq. ft. roof + 600 sq. ft. paving) = 3,700 sq. ft.
(*Av. property in Hingham*)

Natural Area = 39,860 sq. ft. (Lot minus impervious area)

* Annual Rainfall Hingham = 48.0 inches/year

* Lawn Fertilization Rate = 3.00 lbs./1,000 sq. ft./year

* Nitrogen concentration in wastewater = 35.0 mg/l

* Nitrogen from Pavement runoff = 1.50 mg/l

* Nitrogen from Roof runoff = 0.75 mg/l

Nitrogen Load (mg/l) = 7.35

Bedrooms = **Five (5)**

Nitrogen Load (mg/l) = 10.01

Proposed Regulatory Nitrogen Load Limit (mg/l) = 10.00

Financial Assurance Mechanisms (FAM)

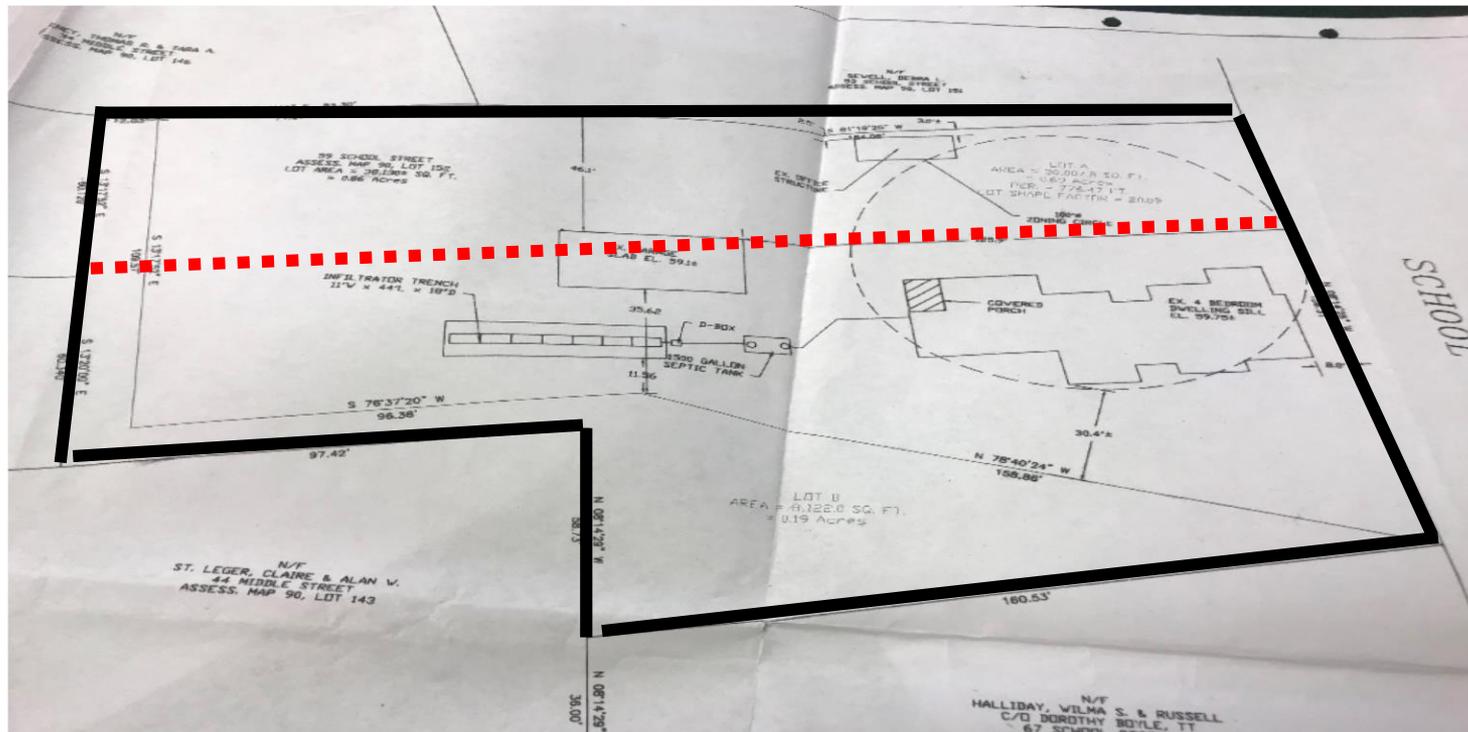


- **FAM** required with all new **I/A treatment plant** systems
- FAM is a legal agreement and escrow account that provides immediate funds for timely repair or replacement of a septic treatment plant system that has failed
- Modeled on the state's septic permitting FAM requirement
- A **waiver** from the FAM requirement is available for septic treatment plant systems being upgraded under remedial use in situations where there is **an existing home**



ANR and Lot Divisions

- An ANR plan is the division of land of lots with frontage on existing roads, whether those roads are public or private





ANR and Lot Divisions

- A proposed lot division **cannot** place any existing (or already approved) septic system on the pre-divided lot **into non-compliance** to current septic regulations, particularly the 12,500sq. ft. of land area/bedroom requirement.
- The Health Department will review:
 - Copy of the ANR plan submitted to the Planning Board
 - Plans must show all septic systems and adjacent wells
 - Results of a Title search (any deed restrictions?)
 - List of direct abutters

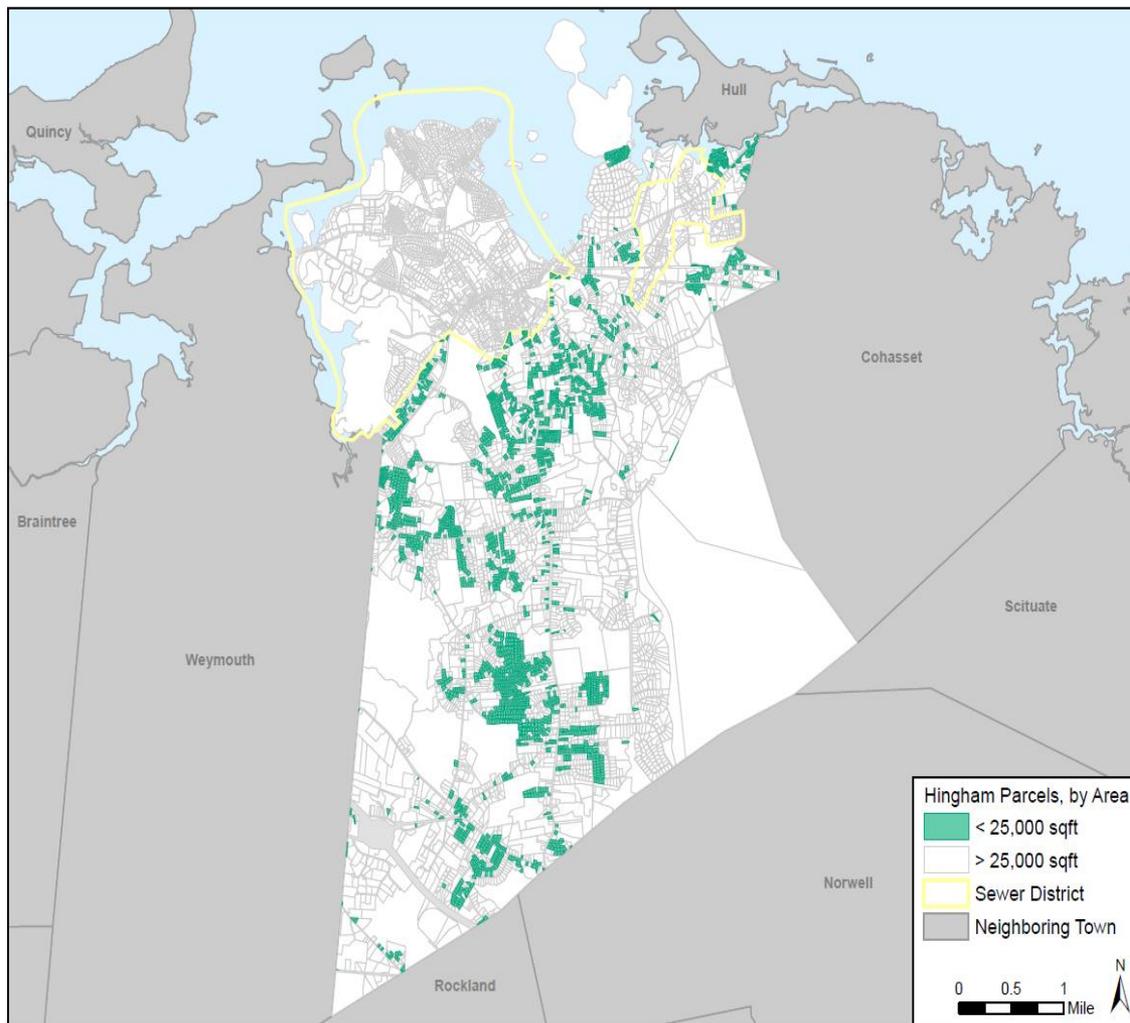


Title 5 Inspections

Title 5 inspection report is required when:

- **New well** is installed as the home's **drinking water supply**.
- **Lot of 25,000 sq.ft. or less** where the house is proposed to be altered, and the **new construction (footprint)** is **more than 33% larger**.
- **Increase in the number of bedrooms** (expansion of use)
- Permit for a proposed **Accessory Dwelling Unit** (additional bedrooms).

Lots 25,000 sq. ft. or less in Hingham





More Information:

- Please go to our website:
www.hingham-ma.gov, Government tab, **“Board of Health”**
- Hingham Health Department:
(781) 741-1466 for any questions
- Email our Executive Health Officer, Susan Sarni:
sarnis@hingham-ma.gov with comments/suggestions
- Any amended version of the Supplemental Septic Regulations will be posted on our website for 60-days before final vote by the Board.