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TITLE 5 PROGRAM'S GUIDANCE ON SYSTEM UPGRADES IN AREAS SUBJECT TO
NITROGEN LOADING LIMITATIONS

Effective date: December 23, 1999

Policy #: BRP/DWM/PeP-P99-5

Program Applicability: BRP/DWM/Watershed Permitting/Title 5 (Boston and Regional Offices)

Supersedes SOP #: None

Approved by: [signed] Arleen O'Donnell, Assistant Commissioner, BRP

Purpose: This policy provides guidance to Department staff and Boards of Health who act on applications for Title 5 system upgrades in areas subject to the nitrogen loading limitations of Title 5, 310 CMR 15.214. This policy addresses the issue of whether an innovative/alternative treatment technology approved by DEP to reduce nitrogen should be required for system upgrades in such areas.

Applicability: This policy applies to Department staff and Boards of Health who act on Title 5 applications for system upgrades in areas subject to Title 5's nitrogen loading limitations. Those areas are set forth in 310 CMR 15.214.

Text: In 1995, the Department revised the Title 5 regulations. The resulting set of regulations provide for increased environmental protection in certain sensitive resource areas, such as areas that contribute to drinking water supplies. Title 5 systems serving new construction in Nitrogen Sensitive Areas and serving new residential construction in areas with on-site wells are subject to a 440 gallon per day (gpd) per acre design flow limitation. Questions have arisen as to how the nitrogen loading limitation provisions of the Code affect upgrades of existing Title 5 systems. This document is intended to provide guidance to Department staff and Boards of Health on that issue.

Areas subject to 440 gpd per acre/Nitrogen Loading Limitations

Under the 1995 Code, the areas that are afforded increased environmental protection and subject to a 440 gpd per acre design flow limitation for new construction include the following:

- residential lots with on-site wells
- interim wellhead protection areas (generally, ½ mile radius of a public water supply well)
- DEP approved Zone IIs of public water supply wells
- nitrogen sensitive embayments (to date, none have been designated by DEP).

In order to control the amount of nitrates entering the groundwater from on-site systems in the above sensitive areas, Title 5 set a 440 gpd per acre design flow limit on systems serving new construction in these areas. Title 5 generally defines “new construction” to mean any increase in design flow. Title 5 uses a 110 gallon per day, per bedroom, design flow for most residential uses. Accordingly, for new construction, in the sensitive resource areas described above, which are subject to the 440 gpd per acre limit, with a conventional Title 5 system, a four bedroom house may be built on an acre of land, a three bedroom house on ¾ acre, a two bedroom house on ½ acre, etc.

The Department has approved certain innovative/alternative (I/A) treatment technologies for enhanced nitrogen removal. With the use of one of these technologies in an area that is subject to the 440 gpd nitrogen loading limitation, an increase in the nitrogen loading limitation is allowed. With the use of a recirculating sand filter, for example, a 550 gpd per acre limit applies and a five bedroom house may be built on an acre; with the use of other technologies, a 660 gpd per acre limit applies and a six bedroom house may be built on an acre, or a three bedroom house on ½ an acre.

System upgrades in areas subject to nitrogen loading limitations

If the owner of a system that is located in an area subject to the 440 nitrogen loading limitations wishes to, or is being required to, upgrade, not repair, his/her system, the approving authority must determine whether enhanced nitrogen removal should be required. Because the nitrogen loading limitations apply to systems serving “new construction,” if the upgrade does not also include an increase in design flow, i.e. the addition of a bedroom in the case of a house, then enhanced nitrogen removal is not required automatically. Instead, under its authority in 310 CMR 15.303(2), 310 CMR 15.304(4) and 310 CMR 15.003(1), and the goal of full or maximum feasible compliance, as stated in 310 CMR 15.404, and based on the circumstances of the particular site, the approving authority may require enhanced nitrogen removal.

Sections 310 CMR 15.303(2) and 310 CMR 15.304(4) of the Code afford the approving authority the discretion, where “necessary to protect public health and safety and the environment,” to require a system owner to install a recirculating sand filter or equivalent alternative technology or to obtain a groundwater discharge permit in accordance with 314 CMR 5.00 and 6.00. Additionally, 310 CMR 15.003(1) of the Code states that in general, “full compliance with the provisions of 310 CMR 15.000 is presumed by the Department to be protective of the public health, safety, welfare and the environment. Specific site or design conditions, however, may require that additional criteria be met in order to achieve the purpose and/or intent of 310 CMR 15.000.”

When an existing system is located in a nitrogen sensitive area, as defined in 310 CMR 15.215 of the Code, or on a residential lot with an on-site well, and no increase in flow is proposed,

Department staff and Boards of Health must use their professional judgement to assess the circumstances of the proposed upgrade so as to determine whether enhanced nitrogen removal should be required.

Circumstances that may warrant requiring enhanced nitrogen removal to meet 440 gpd per acre to the maximum extent feasible in connection with a system upgrade would include, for example, a system serving a lot with an on-site well that is located hydraulically downgradient of the system where well water analysis demonstrates increased nitrogen concentrations in the well. Another example where enhanced nitrogen removal to meet a design flow of 440 gpd per acre to the maximum extent feasible would be appropriate for an upgrade would be where a system is located within a Zone II of a well that exhibits elevated nitrogen concentrations. System upgrades requiring either a variance or local upgrade approval under Title 5, located in areas subject to the nitrogen loading limitations, also might warrant the requirement for enhanced nitrogen removal.

The Department recognizes that decisions regarding these issues are not always clear cut and encourages approving authorities to work with system owners to arrive at the best solution for any given upgrade.

New construction in areas subject to nitrogen loading limitations

When construction of a new house is proposed in an area that is subject to the nitrogen loading limitations, then the 440 gpd per acre limit applies. When a system owner proposes to add a bedroom to an existing house located in an area that is subject to the nitrogen loading limitations, then the provisions of the Code applicable to new construction come into play. A homeowner may add a bedroom to a house without providing enhanced nitrogen removal in such areas where 440 gpd per acre can be met. A bedroom may be added to a three bedroom house on an acre of land, for example, without enhanced nitrogen removal. Likewise, a third bedroom may be added to a two bedroom house on $\frac{3}{4}$ of an acre without enhanced nitrogen removal. In both of these cases, the 440 gpd per acre limitation would be met. Of course, in these cases, the existing Title 5 systems would have to be upgraded first, under the standards applicable to new construction, to serve the increase in design flow. On the other hand, the owner of a three bedroom house on only $\frac{3}{4}$ of an acre who seeks to add a fourth bedroom also may do so, provided that an appropriate I/A technology is used. The homeowner would have to install an I/A technology approved for 660 gpd per acre as part of the system upgrade. Similarly, someone may expand a house from four to five bedrooms or to six bedrooms on an acre with the use of an I/A technology approved for 550 gpd or 660 gpd, respectively. (For new construction on lots subject to the Transition Rules, please refer to the Department's Guidance On the Title 5 Transition Rules for Isolated Lots, dated June 29, 1999.)

The nitrogen loading limitations of the 1995 Code result in increased protection where it is needed the most – in sensitive drinking water resource areas. And, the Innovative/Alternative Technologies Program allows for increased flows, beyond the 440 gpd per acre limit, when enhanced nitrogen removal is provided in these sensitive areas.

310 CMR 15.00: THE STATE ENVIRONMENTAL CODE, TITLE 5: MINIMUM REQUIREMENTS FOR THE SUBSURFACE DISPOSAL OF SANITARY SEWAGE

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Title 5 of the Massachusetts State Environmental Code has been promulgated to provide minimum standards for the protection of public health and the environment when circumstances require the use of individual systems for the disposal of sanitary sewage in areas where municipal sewage systems are not accessible. The following rules, regulations, and standards are deemed by the Department of Environmental Quality Engineering to be generally adequate to protect the public health and the environment in the interests of present and future citizens of the Commonwealth.

Specific, identifiable local conditions may require more stringent regulations to protect these interests. However, in the absence of such specific conditions, the following Code when properly enforced, should afford adequate protection. In general, enforcement, proper care and maintenance, rather than more stringent regulation, are the best means to assure that such systems will serve the purpose intended and prevent danger to public health and the environment.

PART I SUBSTANTIVE PROVISIONS

15.01: Definitions

The words, terms, or phrases listed below for the purpose of this

15.01: continued

Title shall be defined and interpreted as follows:

Approving Authority. The legally constituted body having the rightful power to permit, certify, or approve works for the disposal of sewage or for the treatment of sewage or industrial wastes.

Building Sewer. The pipe which begins 10 feet outside the inner face of the building wall and extends to a public sewer, septic tank, or other place of sewage disposal.

Cellar Wall. The inside of the cellar wall above the footings and below the ground surface.

Cesspool. A covered pit with open-jointed lining in its bottom portions into which raw sewage is discharged, the liquid portion of the sewage being disposed of by seeping or leaching in the surrounding porous soil, and the solids or sludge being retained in the pit to undergo partial decomposition before occasional or intermittent removal.

Cover Material. The earth materials placed on top of leaching facilities to bring the area to finish grade.

Designer. The person authorized by law to prepare plans for sub-surface sewage disposal facilities for submittal to public agencies.

Deep Observation Hole. An open pit dug to permit the examination of the soil and to determine the ground water elevation.

Disposal Works Installer. Any person, firm, corporation, or contractor who installs, alters, constructs, or repairs individual sewage disposal systems.

Distribution Box. A watertight structure which receives settled sewage and distributes it in substantially equal portions to two or more lines leading to a leaching area.

Distribution Line. The pipe used for dispersion of sewage into leaching trenches or leaching fields.

Dosing Tank. A watertight structure placed between a septic tank and distribution box, and equipped with a siphon or a pump designed to discharge settled sewage intermittently to a leaching facility and to provide a rest period between such discharges.

Fill. The earth materials placed beneath and around a leaching facility.

Grease Trap. A watertight structure in which grease is separate from sewage.

Grey Water. Sanitary sewage, excluding the waste discharges from water closets, i.e., any water-carried putrescible waste resulting from the discharge of laundry tubs, washing machines, sinks, showers, dishwashers, or any other source.

Ground Water Elevation. That elevation at which water is observed weeping or flowing from the walls of or standing in a deep observation hole.

H-20 Loading. Standard H-20 truck loading as specified by the American Association of State Highway Officials.

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Humus Toilet. A self-contained toilet from which no liquid or solid waste materials are regularly discharged and from which a humus-like end product is produced.

Impervious Material. Material having a percolation rate greater than 30 minutes per inch, including, but not limited to bedrock, peat, loam and organic matter.

Individual Sewage Disposal System. A subsurface sewage disposal system owned and operated by a person as defined in this regulation.

Industrial Waste. Any water carried or liquid waste resulting from any process of industry, manufacture, trade, or business, or from the development or recovery of any natural resource.

Invert. The lowest portion of the internal cross section of a pipe.

Leaching Facility. An approved structure used for the dispersion of sewage effluent into the soil. These include leaching pits, galleries, chambers, trenches, and fields as described in 310 CMR 15.11 through 15.15.

Lot. An area of land in one ownership, with definite boundaries.

Maximum Ground Water Elevation. Maximum ground water elevation means the height of the ground water table when it is at its maximum level or elevation. This level is usually reached during the months of December through April, and allowances should be made therefore at other times of the year.

Mean High Water. The average of the (tidal) high waters over a 19 year period.

Multiple Compartment Tanks. A septic tank containing more than one settling compartment in series.

Open Drain. Any ditch used for the conveyance of water.

Owner. Every person who alone, or jointly, or severally with others (a) has legal title to any dwelling or dwelling unit, or (b) has care, charge, or control of any dwelling or dwelling unit as agent, executor, executrix, administrator, administratrix, trustee, lessee, or guardian of the estate of the holder of legal title. Each such person thus representing the holder of legal title is bound to comply with the provisions of these minimum standards as if he were the owner. Owner also means every person who operates a rooming house.

Percolation Test. A means of determining the suitability of soil for the subsurface disposal of sewage.

Person. Every individual, partnership, corporation, firm, association, or group, including a city, town, county, the Commonwealth, or other governmental unit, owning property or carrying on an activity regulated by this Title.

Privy. A structure used for the disposal of excreta without water transport. It consists of a shelter built above a pit or vault in the ground into which excrement is deposited.

Reserve Area. An additional area of at least equal capacity as the original sewage disposal area, suitable for subsurface sewage disposal, and upon which no permanent structures will be constructed.

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Sanitary Sewage. Any water-carried putrescible waste resulting from the discharge of water closets, laundry tubs, washing machines, sinks, showers, dishwashers, or any other source.

Sanitary Sewer. A pipe which carries sewage without storm, surface, or ground waters.

Scum. A mass of solids floating at the surface of a septic tank.

Septage. That material removed from any part of an individual sewage disposal system.

Septic Tank. A watertight receptacle which receives the discharge of sewage from a building sewer, and is designed and constructed so as to permit the retention of scum and sludge, digestion of the organic matter, and discharge of the liquid portion to a leaching facility.

Sewage. Sewage means sanitary sewage.

Sewage Disposal Area. The area used for subsurface dispersion of the liquid portion of sewage.

Subsurface Drain. Any underground conduit used for the conveyance of water, including curtain drain.

Watercourse. Any natural or man-made stream, pond, lake, wetland, coastal wetland, swamp or other body of water and shall include wet meadows, marshes, swamps, bogs and areas where ground water, flowing or standing surface water or ice provide a significant part of the supporting substrate for a plant community for at least five months of the year.

Swamp, shall mean areas where ground water is at or near the surface of the ground for a significant part of the growing season or where runoff water from surface drainage frequently collects above the soil surface.

Coastal Wetland, shall mean any bank, marsh, swamp, flat or other lowland subject to tidal action.

15.02: General Requirements¹

(1) Disposal Works Construction Permit. No individual sewage disposal system or other means of sewage disposal shall be located, constructed, altered, repaired, or installed where a common sanitary sewer is accessible adjoining the property and where permission to enter such sewer can be obtained from the authority having jurisdiction over it (310 CMR 15.03(11)) or if a common sanitary sewer is not accessible until a permit for its location, construction, alteration, repair, or installation shall have been issued by the Board of Health. A permit shall not be issued for any system of individual sewage disposal when the total volume of the sewage to be disposed of on any lot is in excess of 15,000 gallons per day, or where sewage treatment facilities are proposed on the lot to be served, until the plans for such system have been approved by the Massachusetts Department of Environmental Quality Engineering in accordance with G. L. c. 111, s. 17. Where sewage flows on a lot exceed 15,000 gallons per day, the Department of Environmental Quality Engineering may require additional treatment of the waste prior to its disposal to the ground.

¹ The applicant should be aware of his obligation to comply with the requirements established by the Division of Water Pollution Control pursuant to G. L. c. 21 s. 43, and the Wetlands Protection Act, G. L. c. 131, s. 40.

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(2) Disposal Works Installer's Permit². No person or firm shall engage in the construction, alteration, installation, or repair of any individual sewage disposal system without first obtaining a Disposal Works Installer's Permit from the Board of Health. Such permits shall expire at the end of the year in which they are issued unless earlier revoked for cause by the Board of Health.

(3) Septage Handler's Permit. No person or firm shall engage in the pumping or transport of the contents of any part of an individual sewage disposal system without first obtaining a Septage Handler's Permit from the Board of Health, in accordance with G. L. c. 111, s. 31A. The application for such permit shall state the site of the disposal, and such site and method of disposal must have been approved by the Department of Environmental Quality Engineering, regardless of the stated volume of material disposed of at that site. Such permits shall be contingent upon compliance with 310 CMR 15.19(1) and shall expire at the end of the year in which they are issued unless earlier revoked for cause. A list of permits issued shall be submitted to the appropriate regional office of the Department of Environmental Quality Engineering at the beginning of each calendar year.

(4) Application for Disposal Works Construction Permit. An application for a disposal works construction permit shall be submitted to the Board of Health and must be accompanied by a plan of the proposed sewage disposal facilities. Such permit shall be invalidated if conditions different than those set forth in the application are found prior to or during actual construction of the individual sewage disposal system. In any event, a permit so granted shall expire two years from the date of issue unless construction of the system of individual sewage disposal is begun before the expiration date or unless this Title has been revised.

(5) Plan of Sewage Disposal System. The submitted plan must show as a minimum: the lot to be served, location and dimensions of the system (including reserve area), design calculations, existing and proposed contours, location and log of deep observation holes, location and results of percolation tests, location of any streams, surface and subsurface drains and wetlands within 100 feet of the sewage disposal system, known sources of water supply within 200 feet of the sewage disposal system, location of any proposed well to serve the lot, location of water lines on the property, maximum ground water elevation in the area of the sewage disposal system, and a profile of the system. The plan must be prepared by a Professional Engineer or other professional authorized by law to prepare such plans.

(6) Use. The use of an individual sewage disposal system shall be in compliance with the terms of the permit issued therefore and shall not exceed the design capacity of the system. Design capacity shall not be reduced for seasonal use.

(7) Building or Plumbing Permits/Subdivision Plans. No building permit, foundation permit, special building permit, or plumbing permit shall be issued until a Sewer Entrance Permit or Disposal Works Construction Permit has first been obtained, unless the Board of Health determines that the existing sewage disposal system is adequate for a proposed alteration or addition to an existing dwelling.

² All systems for the purification or disposal of industrial wastes must be approved by the Department of Environmental Quality Engineering for any flow, as required by G. L. c. 111, s. 17.

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(8) Certificate of Compliance. A new individual sewage disposal system and alteration or repairs to an existing individual system shall not be placed in service, nor shall new dwellings or buildings or additions thereto, which must rely on new individual sewage disposal systems for sewage disposal, be occupied until the Board of Health has issued a Certificate of Compliance indicating that said disposal system has been located, constructed, altered, or repaired in compliance with the terms of the permit and the requirements of this Title. The Board of Health shall require inspection of all construction by the designer or by an agent of the Board of Health and require him to certify in writing that all work has been completed in accordance with the terms of the permit and the approved plans. Such written certification by the designer is mandatory for all work approved by the Department of Environmental Quality Engineering with the additional provision that a copy of the written certification must be submitted to the Department of Environmental Quality Engineering by the designer.

(9) Fees. A fee for the issuance of a construction permit may be charged by the Board of Health at the time an application is made for the permit.

(10) Inspection. The Board of Health or Department of Environmental Quality Engineering may, within its jurisdiction, inspect the installation of all individual sewage disposal systems and may, at any stage of construction, require necessary modifications if conditions are encountered that were not originally observed. In order to facilitate timely inspections, the installer shall provide a reasonable period of notification when requesting an inspection, and the inspection shall be performed within a reasonable period of time by the Board of Health or its agent.

(11) Discharge to Watercourses. Sanitary sewage, grey water, the effluent from any sewage or waste treatment plant, or other polluting water, shall not be discharged into or allowed to flow by means of pipes, drains, etc., into any lake, pond, stream, tidal water, watercourse, or open or covered drain tributary thereto, unless approved by the Massachusetts Department of Environmental Quality Engineering.

(12) Connection to Common Sanitary Sewer¹. Individual sewage disposal systems or other means of sewage disposal shall not be approved where a common sanitary sewer is accessible adjoining the property and where permission to enter such a sewer can be obtained from the authority having jurisdiction over it. The Board of Health may require the owner or occupant of an existing building or buildings, wherever a common sanitary sewer is accessible in an abutting way, to cause such building or buildings to be connected with the common sanitary sewer in a manner and within a period of time satisfactory to the Board of Health.

(13) Volume of Sanitary Sewage. Each unit of the disposal system shall be designed to treat adequately the estimated volume of sanitary sewage to be discharged from the premises to be served. The volume of such flow should be based on the estimated maximum contributory population and the resultant maximum expected daily quantities of sewage as determined from the table below. No cooling water, ground water, discharge of roof drains, or other uncontaminated water shall be discharged to the sanitary sewage disposal system.

¹ The applicant should be aware of his obligation to comply with the requirements established by the Division of Water Pollution Control pursuant to G. L. c. 21 s. 43.

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SEWAGE FLOW ESTIMATES (1)

Type of Establishment	Gallons per Person Per Day
Boarding Schools, Colleges	65
Nursing Home and Rest Home	100
School, without cafeteria, gymnasium or showers	10
School, with cafeteria, but not gymnasium or showers	15
School, with cafeteria, gymnasium and showers	20
Swimming Pool	10
Camp, resident - washroom and toilets	25
Camp, resident - mess hall	10
Camp, day - washroom and toilets	10
Camp, day - mess hall	3
Camp Ground - showers and toilets - per site	75
Gymnasium - per spectator	3
Gymnasium - per participant	25
Theater, Auditorium	3
Public Park - toilet wastes only	5
Public Park - bathhouse, showers, and flush toilets	10
Factory or Industrial Plant, without cafeteria	15
Factory or Industrial Plant, with cafeteria	20
Work or Construction Camp	50

	Gallons per day
Single and multiple dwelling units - Per Bedroom motels, hotels, boarding houses	110
Tennis Club - per court	250
Bowling Alley - per alley	100
Country Club - dining room - per seat	10
Country Club - snack bar or lunch room - per seat	10
Country Club - locker and showers - per locker	20
Church - per seat	3
Church - vestry/kitchen - per person at capacity	5
Trailer, dump station - per site or per trailer	50
Mobile Home Park - per site	200
Office Building - per 1,000 sq. ft	75
Dry Goods Stores - per 100 sq. ft	5
Drive-in - per stall	5
Non-single family, Automatic clothes washer - per washing machine	400
Hospital - per bed	200
Service station, excluding thruway - per island	300
Skating Rink - 3,000 gallons per day plus 5 gallons per seat	

	Gallons per Seat or Chair per Day
Restaurant, food service establishment, lounge, tavern	35
Restaurant, thruway service area	150
Restaurant, kitchen flow	15
Barber Shop/Beauty Salon	100

NOTE: Laundromat wastes are considered industrial wastes and must be approved by the Department of Environmental Quality Engineering.

(1) Estimated sewage flows other than those listed should be considered in relation to actual meter readings of established flows from known or similar installations. Generally, estimated sewage flows will be based on 200 percent of average water meter readings in order to assimilate maximum daily flows.

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(14) Type of System. Except as provided in 310 CMR 15.18, an individual sewage disposal system shall consist of a septic tank discharging its effluent to a suitable subsurface sewage disposal area as hereinafter described. Where buildings are served by more than one system, each system shall consist of a septic tank discharging its effluent to a suitable subsurface sewage disposal area. Separate systems for laundry waste disposal are not recommended.

(15) Drainage. An individual disposal system shall be located in an area where no surface water will accumulate. Provision shall be made to minimize the flow of surface water over the area.

(16) Cover Material. Earth materials used to cover subsurface sewage disposal facilities shall be free from large stones, frozen clumps of earth, masonry, stumps, or waste construction material. Machinery which may crush or disturb the alignment of pipe in the disposal system shall not be allowed on any part of the disposal area.

(17) Construction in Fill. Where an individual sewage disposal system is to be constructed wholly or partially in fill, the fill shall be properly placed and compacted to minimize settlement or it shall be allowed to settle for a minimum of 12 months whichever occurs first. The fill material shall be clean coarse washed sand or other clean granular material essentially free from clay, fines, dust, organic matter, large stones, masonry, stumps, frozen clumps of earth, wood, tree branches, and waste construction material, and shall have a percolation rate of less than 2 minutes per inch before and after placement. Before the fill is put in place, all trees, brush, and stumps shall be removed from the area to be filled. Topsoil, peat, and other impervious materials shall be removed from all areas beneath the leaching facility and for a distance of 25 feet in all directions therefrom when the leaching facility is above natural ground elevation; or impervious materials shall be removed for 10 feet in all directions therefrom when the leaching facility is below natural ground elevation. No sewage disposal system shall be constructed in fill placed upon impervious material unless the requirements of 310 CMR 15.03(6) have been met.

(18) Multiple Use. The use of a subsurface sewage disposal system by more than one lot is prohibited.

(19) Maintenance. Every owner or agent of premises in which there are any private sewers, individual sewage disposal systems, or other means of sewage disposal shall keep the sewers and disposal systems in proper operational condition and shall have such works cleaned or repaired at such time as ordered by the Board of Health. If the owner or agent of the premises fails to comply with such order, the Board of Health may cause the works to be cleaned or repaired and all expenses incurred to be paid by the owner. Sewage disposal works shall be maintained in a manner that will not create objectionable conditions or cause the works to become a source of pollution to any of the waters of the Commonwealth.

(20) Discharge to Surface of Ground. No sanitary sewage shall be allowed to discharge or spill onto the surface of the ground or to flow into any gutter, street, roadway, or public place; nor shall such material discharge onto any private property.

(21) Flow Measurement. Meters, dosing counters, or other flow measuring devices shall be installed to record accurately the flow of sewage when required by the Board of Health or the Department of Environmental Quality Engineering.

(22) Reserve Area. A reserve area of at least equal capacity, suitable for subsurface sewage disposal and upon which no permanent

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structures will be constructed, must be provided for all sewage disposal systems.

15.03: Location

(1) General. The location and installation of each individual sewage disposal system, or other means of disposal, shall be such that with responsible maintenance it will function in a satisfactory manner and will not create a nuisance or discharge into any watercourse of the Commonwealth. In determining a suitable location for the system, consideration shall be given to the size and shape of the lot, slope, natural and adjusted drainage, existing and known future water supplies, depth to ground water, presence of impervious material, soil classifications, and reserve area. No Disposal Works Construction Permit as described in 310 CMR 15.02(1) shall be issued until a representative of the Approving Authority has:

- (a) Performed a site examination
- (b) Witnessed deep observation holes
- (c) Witnessed percolation tests

(2) Site Examination. The site examination shall be made to determine if the size of the lot is compatible with the proposed sewage disposal system and should be made with regards to the distances as outlined in 310 CMR 15.03(7) and the requirements of 310 CMR 15.02(5).

(3) Deep Observation Holes. The purpose of the deep observation holes is to determine the character of the soil in the leaching area and specifically to determine the ground water elevation and the presence of bedrock or impervious material.

On any lot, in the area to be used for leaching, except as noted below, there will be at least two deep observation holes plus any additional number which, in the opinion of the Approving Authority, will be necessary to determine the consistency (or lack thereof) of the character of the soil. The observation holes shall be examined to a depth of at least 4 feet below the bottom of the proposed leaching facility, but in no case shallower than 10 feet, unless this depth is unattainable because of bedrock, etc. The ground water elevation should be determined when the ground water is at its maximum elevation.

EXCEPTION: In cases where three or more contiguous single family lots are being examined at the same time by the same engineer the requirement of two deep observation holes per lot is reduced to one deep observation hole per lot, provided that the character of the soils remain consistent in the opinion of the Approving Authority. The deep observation holes shall be conducted in the area to be used for leaching on each lot.

(4) Percolation Test. The purpose of the percolation test is to determine the suitability of the soil at the leaching elevation and to a depth of four feet below this elevation. In cases where the soil varies with depth as indicated by the deep observation hole, percolation tests at various elevations may be required by the Approving Authority.

(a) At least one percolation test shall be performed at the site of each disposal area in the soil to be used for leaching. Additional tests will be required where the soil structure varies or where large disposal areas are required. Percolation tests can be performed at any time during the year.

(b) Percolation tests as prescribed in this section shall be performed at no expense to the Approving Authority by a Registered Professional Engineer, Registered Sanitarian, or other person who, in the opinion of the Approving Authority, is qualified to perform such tests. All percolation tests shall be performed in the presence

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of a representative of the Approving Authority. The cost of labor and equipment necessary to dig observation holes and the provision of water for the performance of percolation tests shall not be at the expense of the Approving Authority.

(c) Percolation tests shall not be made in holes that have remained open to the atmosphere for more than three days, nor shall they be made in frozen soil. Percolation tests may be performed when the elevation of the soil to be tested is below the frozen soil layer.

(d) Percolation tests shall not be made in filled ground unless the requirements of 310 CMR 15.02(17) have been made.

(e) The minimum leaching area to be installed shall be determined from the following table, with the estimated daily sewage flow as determined in accordance with 310 CMR 15.03(13). The slowest percolation rate obtained shall govern leaching area requirements.

LEACHING AREA REQUIREMENTS

<u>Percolation Rate</u> <u>Minutes Per Inch</u>	<u>Sidewall Area (1) (2)</u>		<u>Bottom Area (3)</u>	
	<u>Square Feet</u> <u>Per Gallon</u>	<u>Gallons Per</u> <u>Square Foot</u>	<u>Square Feet</u> <u>Per Gallon</u>	<u>Gallons Per</u> <u>Square Foot</u>
2.0 or less	0.4	2.50	1.0	1.00
4.0	0.5	2.00	1.2	0.83
6.0	0.6	1.66	1.4	0.71
8.0	0.8	1.25	1.6	0.63
10.0	1.0	1.00	1.8	0.55
15.0	1.5	0.66	2.3	0.43
20.0	2.0	0.50	3.0	0.33
25.0	2.5	0.40	No bottom area allowed	
30.0	3.0	0.33	over 20 minutes per inch	
over 30.0		UNSUITABLE		

- (1) No sidewall area is allowed for leaching fields.
- (2) Sidewall area is the pervious vertical interface of the excavation for the leaching facility below the invert elevation of the inlet, or the lowest invert elevation of the distribution line.
- (3) Bottom area is the pervious horizontal interface of the excavation for the leaching facility.
- (4) Systems for more than 2,000 gallons per day shall not be installed where the percolation rate is slower than 20 minutes per inch.
- (5) Soil with a percolation rate of over 30 minutes per inch is considered impervious and, therefore, unsuitable for the subsurface disposal of sewage.
- (6) Area requirements will be increased by 50 percent when garbage grinders are installed.
- (7) Sewage systems to be constructed in fill must be designed according to the percolation rate of the underlying original soil.
- (8) See Illustration A in 310 CMR 15.11, Illustration B in 310 CMR 15.14, and Illustration C in 310 CMR 15.15.

15.03: continued

(5) Percolation Test Procedures

(a) Prepare a test hole into the proposed leaching strata within the disposal area of 12 inches in diameter with vertical sides 18 inches deep.

(b) Establish a fixed point at the top of the test hole from which all measurements can be taken.

(c) Scratch the bottom and sides of the test hole to remove any smeared soil surfaces. Either add two inches of coarse sand to protect the bottom from scouring, or insert a board or other impervious object in the hole so that water may be poured down or on it during the filling operation.

(d) Carefully fill the hole with clear water to a minimum depth of 12 inches and maintain the water level by adding water as necessary for purpose of soil saturation, but in no case less than 15 minutes after first filling the hole.

(e) After saturation, if the water level drops to a depth of 9 inches in less than 30 minutes, measure the length of time in minutes for it to drop from a depth of 9 inches to a depth of 6 inches. If the rate is erratic in the opinion of the Approving Authority, the hole shall be refilled and soaked until the drop per increment of time is steady. The time for the level to drop from a depth of 9 inches to a depth of 6 inches divided by 3, will be the percolation rate in minutes per inch.

(f) If the initial 3-inch drop requires more than 30 minutes (rate equal to more than 10 minutes per inch) the soil shall be saturated by filling the hole to the top and maintaining it full for at least 4 hours. The soil should then be permitted to swell overnight so that the soil conditions will approach those which exist during the wettest season of the year. After the overnight swelling period, the test shall be made again by filling the hole to a 12-inch depth and maintaining that level for 15 minutes, letting the level drop to 9 inches, then timing the drop between 9 inches and 6 inches. The time elapsed between 9 inches and 6 inches, divided by 3, shall be the percolation rate.

(g) In certain soils, particularly coarse sands, the soil is so pervious as to make the percolation tests as described above difficult, impractical, and meaningless. Therefore, at the discretion of the Approving Authority, the test as described above may be waived and a rate of two minutes per inch can be assumed provided that at least 24 gallons of water is added to the percolation holes within 15 minutes and it is impossible to obtain a liquid depth of 9 inches or the percolation rate is faster than 30 seconds per inch.

(6) Required Depth of Pervious Material. Subsurface sewage disposal systems shall be located in an area where there is at least a 4 foot depth of naturally occurring pervious soil below the entire area of the leaching facility. The naturally occurring pervious soil shall have a percolation rate less than or equal to 30 minutes per inch or 20 minutes per inch for systems over 2000 gallons per day and the 4 foot stratum must be free of impervious materials, such a layers of clay, silt, subsoil or loam.

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15.03: continued

(7) Distances. (1)(2) No disposal facility shall be closer than the distances stated to the components listed in the following table. The distance shall be increased where required by conditions peculiar to a location.

Component	Septic Tank (Feet)	Leaching Facility (Feet)	Building Sewer (Feet)	Privy (Feet)
Well or suction line	50	100(1)	(3)	100(1)
Water supply line (Pressure)	(4)	(4)	(4)	(4)
Property line	10	10	--	30
Cellar wall or inground swimming pool	10	20	--	30
Surface water supplies (reservoirs) or tributaries to reservoirs, including open and subsurface drains	50(2)(5)	100(1)(2)(5)	(5)	100(1)(2)(5)
Watercourses (see definition)	25(2)(5)	50(2)(5)	--	50(2)(5)
Subsurface Drains (CONDUIT)	25	25	--	25
Leaching catch basin or dry well	--	25	--	--
Downhill slope - measured from the top of the leaching facility	150 times the slope (expressed as a fraction) (See Illustration A in 310 CMR 15.11, Illustration B in 310 CMR 15.14, and Illustration C in 310 CMR 15.15)			

- (1) 100 feet is a minimum acceptable distance and no variance shall be granted for a lesser distance except with prior written approval of the Department of Environmental Quality Engineering.
- (2) All distances shall be measured from the average of the mean annual flood elevation in inland areas and from Mean High Water in coastal areas.
- (3) 10 feet if constructed of durable corrosion resistant material with watertight joints, or 50 feet if any other type of pipe is used.
- (4) It is suggested that the disposal facilities be installed at least 10 feet from, and 18 inches below water supply lines. Wherever sewer lines must cross water supply lines, both pipes shall be constructed of class 150 pressure pipe and should be pressure tested to assure watertightness.
- (5) The applicant should be aware of his obligation to comply with the requirements of the Wetlands Protection Act, G. L., c. 131, s. 40.

15.04: Building Sewers in Unsewered Areas

- (1) Size. The building sewer shall be of such size as required by the Approving Authority to serve the connected fixtures. In no case shall the building sewer be less than 4 inches in diameter.
- (2) Material. The building sewer shall be constructed of cast-iron, schedule 40 PVC, vitrified clay, asbestos cement or other material acceptable to the Approving Authority.
- (3) Joints. All pipe joints of the building sewer shall be made watertight and protected against damage by roots. Poured-type joints shall be properly wiped on the inside to present no obstruction of flow.
- (4) Base. The building sewer shall be laid on a firm base.
- (5) Grade. The building sewer shall be designed to provide a minimum velocity of sewage flow of 2 feet per second when flowing full. This requirement is met when a 4-inch building sewer is laid at a slope of not less than .01 (1/8-inch per foot). A slope of .02 (1/4-inch per foot) is desirable.
- (6) Alignment. The building sewer shall be laid on a continuous grade and as nearly as possible in a straight line.
- (7) Manholes. Manholes, with metal frames and covers at grade, shall be provided at the junction of two or more sewers, at all sharp changes in direction or grade of sewers, and at intervals no greater than 300 feet except that manholes will not be necessary where building sewers join lateral sewers if a long radius bend is provided. All gravity sewer manholes shall have an open channel depth equal to or greater than the diameter of the inlet sewer and the change of direction in each manhole shall not exceed 90 degrees. (Change of direction is the interior angle between the new direction of flow and the imaginary extension of the original direction of flow.)
- (8) Ventilation. The building sewer shall be vented through the vent stack or main vent of the building served by it, and no trap shall be installed in the building sewer or building drain.

15.05: Grease Traps

- (1) Installation. Grease traps must be provided at installations such as restaurants, nursing homes, schools, hospitals, or other installations from which large quantities of grease can be expected to be discharged.
- (2) Location. Grease traps shall be installed on a separate building sewer serving that part of the plumbing system into which the grease will be discharged. The discharge from the grease trap must flow to a properly designed septic tank or a building sewer prior to the septic tank.
- (3) Capacities. Grease traps shall have a minimum depth of 4 feet and a minimum capacity of 1000 gallons, and shall have sufficient capacity to provide at least a 24 hour detention period for the kitchen flow. Kitchen flow shall be calculated in accordance with 310 CMR 15.02(13).
- (4) Construction. Grease traps shall be watertight and constructed of sound and durable materials not subject to excessive corrosion, decay, or frost damage, or to cracking or buckling due to settlement or backfilling. Tanks and covers shall be designed and constructed so as to withstand normal structural loadings. A tank installed in ground water shall be weighted to prevent the tank from floating when it is emptied.

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15.06: continued

- (5) Depth of Tees. The inlet tee shall extend to the mid depth of the tank. The outlet tee shall extend to within 12 inches of the bottom of the tank. Tees shall be cast iron or Schedule 40 PVC and properly supported by a hanger, strap or other device.
- (6) Baffles. Baffles may be provided as necessary to maximize the separation of grease from the sewage. Baffles may not be considered a substitute for the inlet and outlet tees.
- (7) Base. Grease traps shall be installed on a level stable base that will not settle.
- (8) Materials. Grease traps may be constructed of poured reinforced concrete, precast reinforced concrete, or prefabricated material acceptable to the Approving Authority.
- (9) Access Manholes. Grease traps shall be provided with a minimum 24 inch diameter manhole frame and cover to grade over the inlet and outlet.
- (10) Accessibility. Grease traps shall be located on the lot so as to be accessible for servicing and cleaning.
- (11) Invert Elevation. The invert elevation of the inlet of a grease trap shall be at least 2 inches above the invert elevation of the outlet. Inlet and outlet shall be located at the center line of the tank, and at least 12 inches above the maximum ground water elevation.
- (12) Backfill. Backfill around the grease trap shall be placed in such a manner as to prevent damage to the tank.
- (13) Cleaning. Grease traps shall be inspected monthly and shall be cleaned when the level of grease is 25 percent of the effective depth of the trap or at least every 3 months.

15.06: Septic Tanks

- (1) Capacities. A septic tank shall have an effective liquid capacity of not less than 150 percent of the design flow estimated, but in no case less than 1000 gallons.
- (2) Garbage Disposal. Garbage grinders are not recommended where they discharge to subsurface disposal facilities. When they are installed, the liquid capacity of the septic tanks shall be at least 200 percent of the estimated design flow, but in no case less than 1500 gallons.
- (3) Liquid Depth. The liquid depth of the tank shall be a minimum of 4 feet. The tank may be oval, circular, rectangular, or square in plan, provided the distance between the outlet and inlet of the tank is at least equal to the liquid depth of the tank.
- (4) Compartments. Multi-compartment tanks with transverse baffles may be used provided that:
 - (a) The number of compartments does not exceed two.
 - (b) The total capacity is not less than 2000 gallons.
 - (c) The capacity of the first compartment is at least equal to the capacity of the second compartment.
- (5) Tanks in Series. Tanks in series may be approved provided that the capacity of the first tank is at least equal to the required capacity pursuant to 310 CMR 15.06(1), and provided that the number of tanks does not exceed two.

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15.06: continued

(6) Tanks in Parallel. Septic tanks shall not be installed in such a manner that the sewage flow from a single sewer is divided, with one portion being discharged to one tank and the remaining portion being discharged to a second tank.

(7) Construction. Septic tanks shall be watertight and constructed of sound and durable materials not subject to excessive corrosion, decay, or frost damage, or to cracking or buckling due to settlement or backfilling. Tanks and covers shall be designed and constructed so as to withstand anticipated loadings. Any tank installed in a location where there is high ground water shall be weighted to prevent the tank from floating when it is emptied.

(8) Tees. Inlet and outlet tees shall be of cast-iron, Schedule 40 PVC, or cast-in-place concrete, and shall extend a minimum of 6 inches above the flow line of the septic tank and be on the center line of the septic tank located directly under the clean-out manhole. There shall be an air space of at least 3 inches between the tops of the tees and the inside of the tank cover, and the tops of the tees shall be left open to provide ventilation or separate ventilation shall be provided.

(9) Depth of Tees. The inlet tee (baffles are not acceptable) shall extend a minimum of 10 inches below the flow line. The outlet shall be provided with a tee extending below the flow line in accordance with the following table:

<u>Liquid Depth in Septic Tank</u>	<u>Depth of Outlet Tee below Flow Line</u>
4 feet	14 inches
5 feet	19 inches
6 feet	24 inches
7 feet	29 inches
8 feet	34 inches

(10) Base. Septic tanks shall be installed on a level stable base that will not settle.

(11) Materials. Septic tanks may be constructed of poured reinforced concrete, precast reinforced concrete, or prefabricated material acceptable to the Approving Authority.

(12) Access Manholes. At least one 24-inch manhole with a readily removable cover of durable material shall be provided for each compartment. Inlet and outlet tees shall be made accessible for cleaning by providing manholes over the tees. Manhole covers for septic tanks serving single family dwellings shall not be more than 12 inches below finished grade and may, at the discretion of the Approving Authority, be required to be brought to finished grade. Septic tanks serving other establishments with flows under 2000 gallons per day shall be provided with at least one 24-inch diameter manhole located over the inlet tee and a metal frame and cover to finished grade. Septic tanks designed for flows in excess of 2000 gallons per day shall be provided with at least two 24-inch diameter manholes (over inlet and outlet tees) with metal frames and covers at finished grade. Distance between access manholes shall not exceed 18 feet on center.

(13) Accessibility. Septic tanks shall be located on the lot so as to be accessible for servicing and cleaning.

(14) Invert Elevation. The invert elevation of the inlet of a septic tank shall be at least 2 inches above the invert elevation of the outlet.

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15.06: continued

- (15) Backfill. Backfill around the septic tank shall be placed in such a manner as to prevent damage to the tank.
- (16) Cleaning. Septic tanks should be inspected and cleaned at least annually.
- (17) Ground Water. The invert elevation of the septic tank outlet shall be at least one foot above the maximum ground water elevation.
- (18) Pumping to Septic Tank. Pumping of sewage to a septic tank shall not be allowed without the written approval of the Department of Environmental Quality Engineering.

15.07: Dosing Tanks

- (1) General. A dosing tank shall be provided for Leaching Chamber and Leaching Field systems where the volume of waste to be disposed of is in excess of 2000 gallons per day.
- (2) Alternation. Dosing shall alternate when the total volume of waste to be disposed of exceeds 5000 gallons per day. Alternating siphons and pumps shall discharge to separate disposal areas of equal size.
- (3) Capacity. Dosing tanks shall have capacity to discharge a volume adequate to cover the dosed leaching area to a depth of at least 1 inch, in not over 15 minutes.
- (4) Construction. Dosing tanks shall be constructed of concrete or other material as approved by the Department of Environmental Quality Engineering and conform with 310 CMR 15.06(7) and shall be cast without joints and watertight if installed below ground water level.
- (5) Base. Dosing tanks shall be constructed on a level stable base that will not settle.
- (6) Ventilation. Dosing tanks shall be constructed in a manner that will permit venting through the building sewer or other suitable outlet.
- (7) Ground Water. The invert elevation of the inlet shall be at least 1 foot above maximum ground water elevation and the tank shall be waterproof and watertight.
- (8) Manholes. To provide access and to facilitate repair or adjustment of the siphons or pumps, dosing tanks should be provided with manholes at least 24 inches in diameter with metal frames and covers to grade over each pump or siphon.
- (9) Inspections. Annual inspections are recommended to determine if the pumps or siphons are in working order.

15.08: Siphons

- (1) Construction. Siphons shall be constructed of cast-iron or other material approved by the Department of Environmental Quality Engineering and shall be installed in strict conformance with the manufacturers specifications.

15.09: Pumps

- (1) Location. Pumps shall not be installed prior to a septic tank without the approval of the Department of Environmental Quality Engineering.

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15.09: continued

(2) Number. At least 2 pumps shall be installed, except in cases where repairs to systems under 1000 gallons per day are being made or for single family residences.

(3) Installation. All pumps shall be installed in strict conformance with the manufacturer's specifications. Pumps for settled sewage shall be capable of passing at least 1-1/4 inch solids.

(4) Controls. Pump controls shall be moisture proof and operate in the following sequence:

- (a) Pumps off
- (b) Lead pump on
- (c) Alarm on and Lag pump on
- (d) Pumps must alternate and, in cases where the flow is in excess of 5000 gallons per day, they must serve separate disposal areas.

(5) Alarm. All pumps shall be equipped with an alarm powered by a circuit separate from the pump power.

(6) Standby Power. Standby power shall be provided at apartment houses, condominiums, elderly housing, and all other premises which are not vacated during power failure. An empty emergency overflow tank with 24 hour storage capacity may be substituted where such tank can be placed completely above ground water.

15.10: Distribution Boxes

(1) Distribution Box. A distribution box shall be installed between a septic tank and a leaching facility to provide equal distribution.

(2) Inlet. Where the distribution system is dosed or the slope of the inlet pipe is greater than 0.08, the distribution box shall be provided with an inlet tee cut-off one inch above the outlet invert.

(3) Outlet Elevation. The invert elevation of all the outlets shall be the same, and shall be at least 2 inches below the inlet. Outlet pipes shall be level for at least 2 feet.

(4) Sump. The distribution box shall be provided with a sump extending 6 inches below the bottom of the outlet pipe.

(5) Construction. Distribution boxes shall be constructed of concrete or other durable material. They shall be watertight and designed to accommodate the necessary distribution laterals.

(6) Number of Outlets. There shall be at least one 4 inch outlet for every pair of 4-inch distribution laterals, and at least one 6-inch outlet for every two pairs of 4-inch distribution laterals.

(7) Base. Distribution boxes shall be installed on a level stable base that will not settle.

(8) Ventilation. The distribution box shall be constructed in such a manner as to provide ventilation of the disposal field, either through a special vent or back through the building sewer.

(9) Manholes. Distribution boxes shall be provided with readily removable covers of durable material. Systems designed for over 2000 gallons per day shall have a minimum 18 inch manhole over each distribution box, with metal frame and cover to finished grade.

15.11: Leaching Pits*

- (1) Use. Leaching pits are preferred where their installation is possible.
- (2) Leaching Area. The leaching area required shall be determined in accordance with the provisions of 310 CMR 15.03. The leaching area shall be considered as the pervious bottom area of the excavation and the sidewall areas of the excavation below the invert of the inlet. Impervious area of the sidewall below the inlet shall not be considered as available leaching area.
- (3) Ground Water. Leaching pits shall not be constructed in areas where the maximum ground water elevation is less than 4 feet below the bottom of the excavation.
- (4) Spacing. When more than one leaching pit is installed, they shall be designed such that they will function in parallel, and the distance between excavation sidewalls shall be no less than twice the effective width or twice the effective depth of the pit, whichever is greater.
- (5) Manholes. There shall be a minimum of one inspection manhole per pit. For systems designed for over 2000 gallons per day, the manholes shall be at least 18 inches in diameter with metal frames and covers to finished grade.
- (6) Construction. The lining of the pit shall be constructed of brick, perforated concrete, or interlocking concrete blocks laid dry with open joints in a manner to prevent displacement. At least 12 inches and not more than 48 inches of 3/4 to 1-1/2 inch stone shall be placed around the liner. The liner shall be built to allow the liquid to pass easily through openings to the surrounding stone. The cover shall be constructed of reinforced concrete or other approved material.
- (7) Stone. The stone shall consist of washed stone ranging from 3/4 to 1-1/2 inches in size and be free of iron, fines, and dust in place. The stone shall be covered with at least a 2 inch layer of washed stone ranging from 1/8 to 1/2 inch in size, and be free of iron, fines, and dust in place. All stone must have less than 0.2 percent material finer than a number 200 sieve as determined by the AASHTO Test Methods T-11 and T-27 (latest edition).
- (8) Reserve Area. A reserve area sufficient to replace the capacity of the original leaching area must be provided. The area between the leaching pits may be used for part of the reserve area.
- (9) Impervious Material. Excavations into or fill upon impervious material shall not be allowed. Excavations through impervious material may be allowed if at least 4 feet of naturally occurring pervious material, as demonstrated by a percolation test, remains beneath the lowest point of excavation. All construction after excavation through impervious material shall be in accordance with 310 CMR 15.02(17).
- (10) Surface Drainage. The grade above and adjacent to a leaching pit system shall slope at least 2 percent to prevent the accumulation of surface water.
- (11) Cover Material. The minimum depth of cover material over the stone shall be 12 inches. Earth materials used to cover leaching pit systems shall be free of large stones, frozen clumps of earth, masonry, stumps, or waste construction material. Machinery which may crush or disturb the alignment of pipe in the disposal system shall not be allowed on any part of the disposal area.

* See Figure 1 in 310 CMR 15.12.

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15.11: continued

(12) Sloping Ground. When pits are built at different elevations, construction shall be such as to prevent the sewage from upper pits from flowing into lower pits.

(13) Excavation. Excavation may be made by machinery provided that the soil at the bottom of the disposal system is not compacted. The bottom of each system shall be level.

(14) Location under Area Subject to Vehicular Traffic. When leaching pit systems are constructed under areas subject to vehicular traffic, the pits shall be capable of withstanding H-20 wheel loads.

(15) Frozen Conditions. No pits shall be constructed in frozen soil. Pits may be constructed in cases where the construction elevation is below the depth of the frost line.

15.12: Leaching Galleries *

(1) Leaching Area. The leaching area required shall be determined in accordance with the provisions of 310 CMR 15.03. The leaching area shall be considered as the pervious bottom area of the excavation and the sidewall areas of the excavation below the invert of the inlet. Impervious area of the sidewall below the inlet shall not be considered as available leaching area.

(2) Ground Water. Leaching galleries shall not be constructed in areas where the maximum ground water elevation is less than 4 feet below the bottom of the excavation.

(3) Distribution. An inlet must be provided at least every 20 feet.

(4) Spacing. When more than one gallery is installed, the distance between excavation sidewalls shall be no less than twice the effective width or twice the effective depth of the gallery, whichever is greater.

(5) Manholes. For systems designed for over 2000 gallons per day, the manholes shall be at least 18 inches in diameter with metal frames and covers to finished grade. For gallery trenches less than 100 feet long, there shall be a minimum of one manhole. For gallery trenches greater than 100 feet long, there shall be a minimum of one manhole per 100 linear feet of each trench.

(6) Construction. The galleries shall be constructed with open joints or perforated walls in a manner to prevent displacement. At least 12 inches and not more than 48 inches of 3/4 to 1-1/2 inch stone shall be placed beyond the liner. The liner shall be built to allow the liquid to pass easily through openings to the surrounding stone. The cover shall be constructed of reinforced concrete or other approved material.

(7) Stone. The stone shall consist of washed stone ranging from 3/4 to 1-1/2 inches in size and be free of iron, fines, and dust in place. The stone shall be covered with at least a 2 inch layer of washed stone ranging from 1/8 to 1/2 inch in size, and be free of iron, fines, and dust in place. All stone must have less than 0.2 percent material finer than a number 200 sieve as determined by the AASHTO Test Methods T-11 and T-27 (latest edition).

* See Figure 1 in 310 CMR 15.12

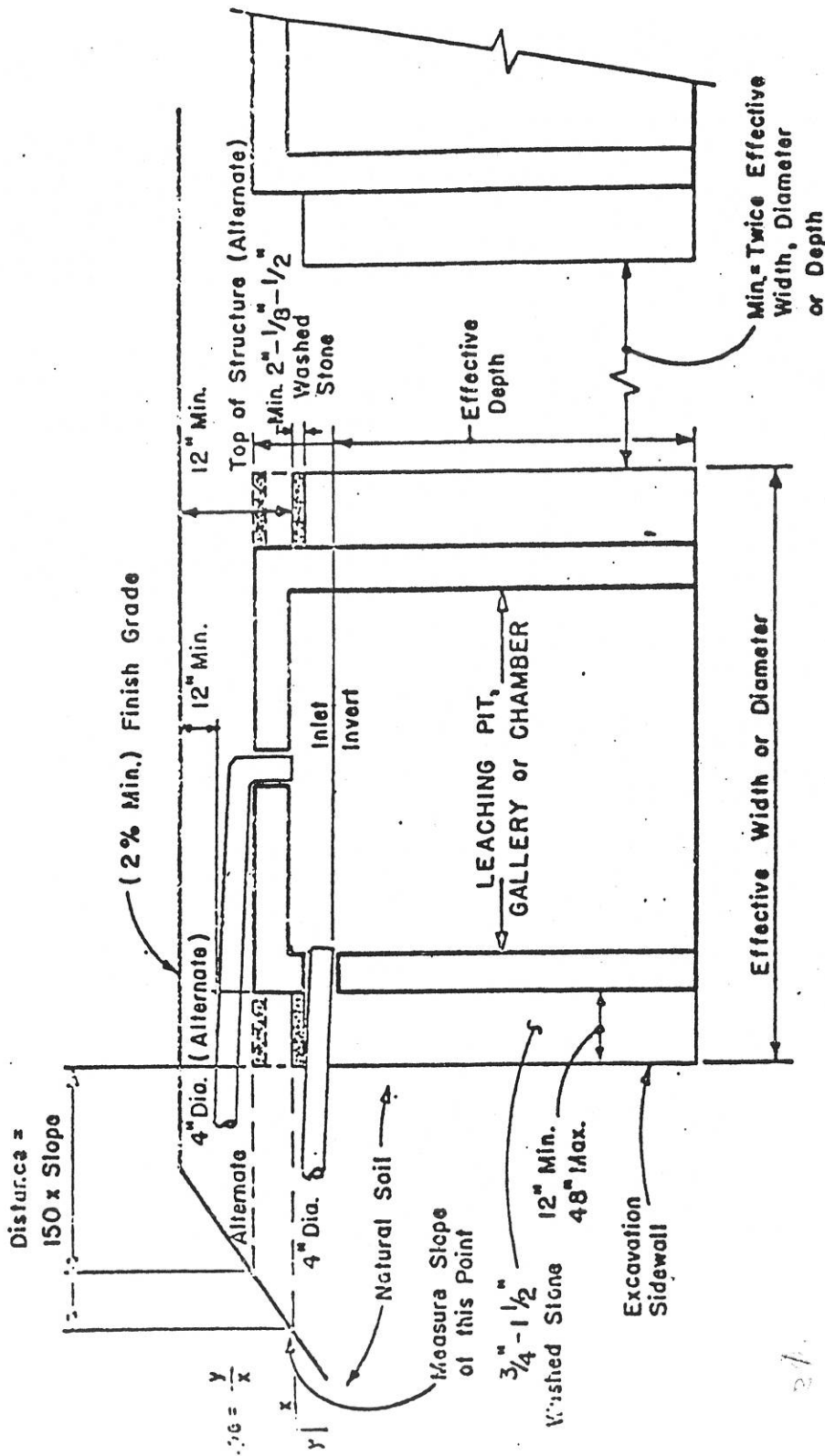
15.12: continued

- (8) Reserve Area. A reserve area sufficient to replace the capacity of the original leaching area must be provided. The area between the galleries may be used for part of the reserve area.
- (9) Impervious Material. Excavations into or fill upon impervious material shall not be allowed. Excavations through impervious material may be allowed if at least 4 feet of naturally occurring pervious material, as demonstrated by a percolation test, remains beneath the lowest point of excavation. All construction after excavation through impervious material shall be in accordance with 310 CMR 15.02(17).
- (10) Surface Drainage. The grade above and adjacent to a leaching gallery system shall slope at least 2 percent to prevent the accumulation of surface water.
- (11) Cover Material. The minimum depth of cover material over the stone shall be 12 inches. Earth materials used to cover leaching gallery systems shall be free of large stones, frozen clumps of earth, masonry, stumps, or waste construction material. Machinery which may crush or disturb the alignment of pipe in the system shall not be allowed on any part of the disposal area.
- (12) Sloping Ground. When galleries are built at different elevations, construction shall be such as to prevent the sewage from upper galleries from flowing into the lower galleries.
- (13) Excavation. Excavation may be made by machinery provided that the soil at the bottom of the gallery excavation is not compacted. The bottom of each gallery system shall be level.
- (14) Location under Area Subject to Vehicular Traffic. When gallery systems are constructed under areas subject to vehicular traffic, the galleries shall be capable of withstanding H-20 wheel loads.
- (15) Frozen Conditions. No galleries shall be constructed in frozen soil. Galleries may be installed in cases where the construction elevation is below the depth of the frost line.
- (16) Joints. Horizontal joints shall be covered with a material suitable to prevent infiltration of overburden.

15.12: continued

FIGURE 1.

LEACHING PITS, GALLERIES CHAMBERS (ILLUSTRATION A)



LEACHING PITS; GALLERIES, CHAMBERS

No Scale

Illustration A

15.13: Leaching Chambers*

- (1) Leaching Area. The leaching area required shall be determined in accordance with the provisions of 310 CMR 15.03. The leaching area shall be considered as the pervious bottom area of the excavation and the sidewall areas of the excavation below the invert of the inlet. Impervious area of the sidewall below the inlet shall not be considered as available leaching area.
- (2) Ground Water. Leaching chambers shall not be constructed in areas where the maximum ground water elevation is less than 4 feet below the bottom of the excavation.
- (3) Distribution. Effluent shall be applied to the leaching area in a uniform manner, either by integral or separate piping. Suitable splash pads of washed stone, concrete or similar material or velocity reducing pits shall be installed to prevent scouring of the leaching surface. If the leaching chambers are to be installed in a trench formation, the effluent shall be applied every 20 feet. If a bed formation is utilized, the maximum leaching area per distribution line shall not exceed 60 feet by 60 feet.
- (4) Spacing. The minimum distance between the excavation sidewalls of adjacent leaching chamber fields shall be 4 feet. The minimum distance between leaching chamber trench walls shall be twice the effective width or twice the effective depth of the trench, whichever is greater.
- (5) Manholes. There shall be a minimum of 1 inspection manhole for each 2000 feet of leaching area. Manholes shall be located so as to provide access to distribution inlets and the leaching area. For systems designed for over 2000 gallons per day, the manholes shall be at least 18 inches in diameter with metal frames and covers to finished grade.
- (6) Construction. The chambers shall be constructed with open joints or perforated walls in a manner to prevent displacement. At least 12 inches and not more than 48 inches of 3/4 to 1-1/2 inch stone shall be placed around the periphery of the chambers. The chambers shall be built to allow the liquid to pass easily through openings to the surrounding stone. The cover shall be constructed of reinforced concrete or other approved material.
- (7) Stone. The stone shall consist of washed stone ranging from 3/4 to 1-1/2 inches in size and be free of iron, fines, and dust in place. The stone shall be covered with at least a 2 inch layer of washed stone ranging from 1/8 to 1/2 inch in size, and be free of iron, fines, and dust in place. All stone must have less than 0.2 percent material finer than a number 200 sieve as determined by the AASHTO Test Methods T-11 and T-27 (latest edition).
- (8) Reserve Area. A reserve area sufficient to replace the capacity of the original leaching area must be provided.
- (9) Impervious Material. Excavations into or fill upon impervious material shall not be allowed. Excavations through impervious material may be allowed if at least 4 feet of naturally occurring pervious material, as demonstrated by a percolation test, remains beneath the lowest point of excavation. All construction after excavation through impervious material shall be in accordance with 310 CMR 15.02(17).

See Figure 1 in 310 CMR 15.12.

15.13: continued

(10) Surface Drainage. The grade above and adjacent to a leaching chamber system shall slope at least 2 percent to prevent the accumulation of surface water.

(11) Cover Material. Earth materials used to cover chamber systems shall be free of large stones, frozen clumps of earth, masonry, stumps, or waste construction material. Machinery which may crush or disturb alignment of pipe in the system shall not be allowed on any part of the disposal area.

(12) Sloping Ground. When chambers are built at different elevations, construction shall be such as to prevent the sewage from upper chambers from flowing into lower chambers.

(13) Excavation. Excavation may be made by machinery provided that the soil at the bottom of the disposal system is not compacted. The bottom of each chamber unit shall be level.

(14) Location under Area Subject to Vehicular Traffic. When chamber systems are constructed under areas subject to vehicular traffic, the chamber shall be capable of withstanding H-20 wheel loads.

(15) Frozen Conditions. No chambers shall be constructed in frozen soil. Chambers may be installed in cases where the construction elevation is below the depth of the frost line.

(16) Joints. Horizontal joints shall be covered with a material suitable to prevent infiltration of overburden.

(17) Ventilation. Leaching chamber systems designed to be dosed must be vented at the downstream end of the system.

15.14: Leaching Trenches*

(1) Leaching Area. The leaching area required shall be determined in accordance with the provisions of 310 CMR 15.03. The leaching area shall be considered as the pervious bottom area of the excavation and the sidewall areas of the excavation below the invert of the inlet. Impervious area of the sidewall below the inlet shall not be considered as available leaching area.

(2) Ground Water. Leaching trenches shall not be constructed in areas where the maximum ground water elevation is less than 4 feet below the bottom of the trench.

(3) Spacing. When more than one leaching trench is installed, the distance between excavation sidewalls shall be no less than twice the effective width or twice the effective depth of the trench, whichever is greater. In no case, shall the distance between excavation sidewalls be less than 6 feet if the area between the trenches is to be used for reserve area or 4 feet if the area between the trenches is not to be used for reserve area.

(4) Width. The minimum width of the leaching trench bottom shall be 12 inches.

(5) Length. The maximum length of each leaching trench shall be 100 feet.

* See Figure 1 in 310 CMR 15.14

15.14: continued

(6) Construction. Distribution lines shall have a minimum diameter of 4 inches and shall be laid true to line and grade. The distribution pipe may consist of perforated tile, perforated bituminized fiber, perforated plastic, or vitrified clay pipe laid with an adequate number of open joints. All distribution pipes from the distribution box to the leaching trench shall be unperforated and shall be laid with tight joints. The depth to the crown of the pipe forming the distribution lines shall be not less than 12 inches from finished grade. The distribution pipe shall have a minimum slope of 0.005.

(7) Stone. The stone shall consist of washed stone ranging from 3/4 to 1-1/2 inches in size and be free of iron, fines, and dust in place. It shall extend the full width of the trench, shall be not less than 6 inches deep beneath the bottom of the distribution pipes and shall extend at least to the top of the distribution pipes. The stone shall be covered with at least a 2 inch layer of washed stone ranging from 1/8 to 1/2 inch in size, and be free of iron, fines, and dust in place. All stone must have less than 0.2 percent material finer than a number 200 sieve as determined by the AASHTO Test Methods T-11 and T-27 (latest edition).

(8) Reserve Area. A reserve area sufficient to replace the capacity of the original leaching area must be provided. The area between leaching trenches may be used for part of the reserve area.

(9) Impervious Material. Excavations into or fill upon impervious material shall not be allowed. Excavations through impervious material may be allowed if at least 4 feet of naturally occurring pervious material, as demonstrated by a percolation test, remains beneath the lowest point of excavation. All construction after excavation through impervious material shall be in accordance with 310 CMR 15.02(17).

(10) Surface Drainage. The grade above and adjacent to a leaching trench shall slope at least 2 percent to prevent the accumulation of surface water.

(11) Cover Material. The minimum depth of cover material shall be 12 inches. Earth materials used to cover leaching trench systems shall be free of large stones, frozen clumps of earth, masonry, stumps or waste construction material. Machinery which may crush or disturb the alignment of pipe in the disposal system shall not be allowed on any part of the disposal area.

(12) Sloping Ground. When trenches are built at different elevations, construction shall be such as to prevent the sewage from upper trenches from flowing into lower trenches.

(13) Excavation. Excavation may be made by machinery provided that the soil at the bottom of the disposal trench is not compacted. The bottom of each trench shall be level.

(14) Location Under Area Subject to Vehicular Traffic. When leaching trench systems are constructed under areas subject to vehicular traffic, the trenches shall be capable of withstanding H-20 wheel loads.

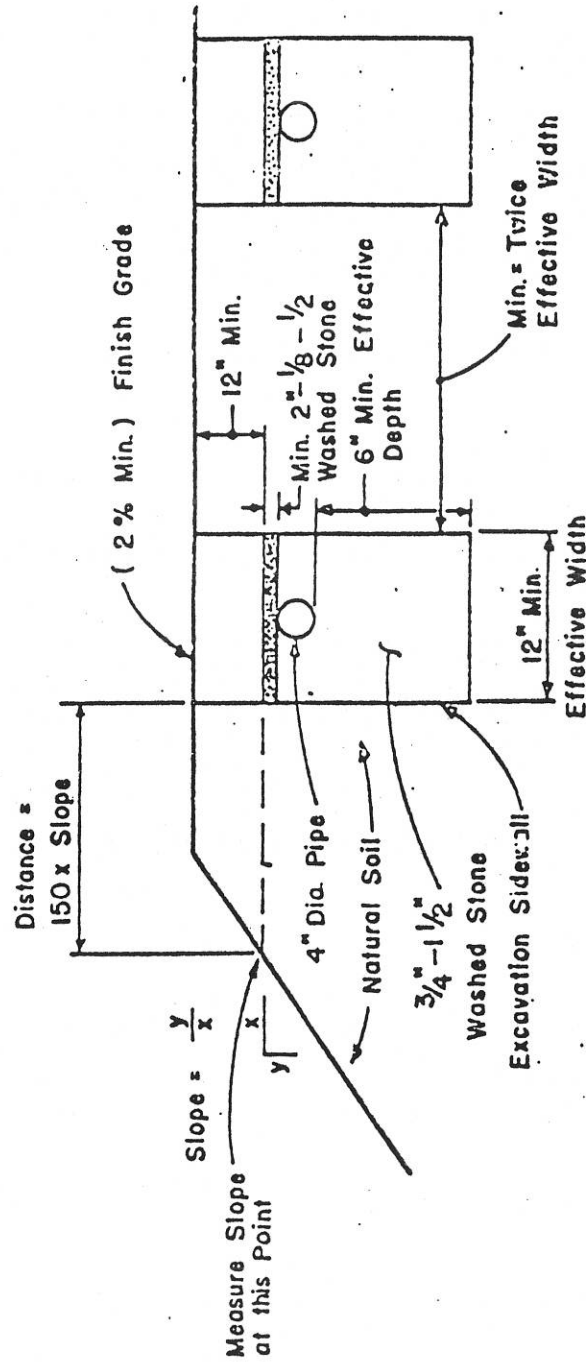
(15) Frozen Conditions. No trench shall be constructed in frozen soil. Trenches may be installed in cases where the construction elevation is below the depth of the frost line.

(16) Ventilation. Leaching trench systems designed to be dosed must be vented at the downstream end of the system.

15.14: continued

FIGURE 1.

LEACHING TRENCH (ILLUSTRATION B)



LEACHING TRENCH

No Scale

Illustration B

310 CMR: DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING

15.15: Leaching Fields*

(1) Use. Leaching fields are not permitted in locations where the percolation rate is slower than 20 minutes per inch.

(2) Leaching Area. The leaching area required shall be determined in accordance with provisions of 310 CMR 15.03. The leaching area shall be considered at the pervious bottom area of the excavation.

(3) Ground Water. Leaching fields shall not be constructed in areas where the maximum ground water elevation is less than 4 feet below the bottom of the field.

(4) Construction. Distribution lines shall have a minimum diameter of 4 inches and shall be laid true to line and grade. The distribution pipe may consist of perforated tile, perforated bituminized fiber, perforated plastic or open-jointed VC. All distribution pipes from the distribution box to the leaching field shall be unperforated and shall be laid with tight joints. The depth to the crown of the pipe forming the distribution lines shall be not less than 12 inches from finished grade.

Leaching fields shall be constructed in accordance with the following table:

Minimum lines per field	2
Maximum length per line	100 feet
Slope of distribution lines	0.005
Maximum distance between distribution lines	6 feet
Minimum distance between walls of adjacent fields	4 feet

(5) Stone. The stone shall consist of washed stone ranging from 3/4 to 1-1/2 inches in size and be free of iron, fines, and dust in place. It shall extend the full width of the field, shall be not less than 6 inches deep beneath the bottom of the distribution pipes and shall extend at least to the top of the distribution pipes. The stone shall be covered with at least a 2 inch layer of washed stone ranging from 1/8 to 1/2 inch in size, and be free of iron, fines, and dust in place. All stone must have less than 0.2 percent material finer than a number 200 sieve as determined by the AASHTO Test Methods T-11 and T-27 (latest edition).

(6) Reserve Area. A reserve area sufficient to replace the capacity of the original leaching area must be provided.

(7) Impervious Material. Excavations into or fill upon impervious material shall not be allowed. Excavations through impervious material may be allowed if at least 4 feet of naturally occurring pervious material, as demonstrated by a percolation test, remains beneath the lowest point of excavation. All construction after excavation through impervious material shall be in accordance with 310 CMR 15.02(17).

(8) Surface Drainage. The grade above and adjacent to a leaching field system shall slope at least 2 percent to prevent the accumulation of surface water.

(9) Cover Material. The minimum depth of cover material shall be 12 inches. Earth materials used to cover leaching fields shall be free of large stones, frozen clumps of earth, masonry, stumps, or waste construction material. Machinery which may crush or disturb the alignment of pipe in the disposal system shall not be allowed on any part of the disposal area.

* See Figure 1 in 310 CMR 15.15.

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15.15: continued

(10) Sloping Ground. When fields are built at different elevations, construction shall be such as to prevent the sewage from upper fields from flowing into lower fields.

(11) Excavation. Excavation may be made by machinery provided that the soil at the bottom of the leaching field is not compacted. The bottom of each leaching field shall be level.

(12) Location Under Area Subject to Vehicular Traffic. When leaching field systems are constructed under areas subject to vehicular traffic, the fields shall be capable of withstanding H-20 wheel loads.

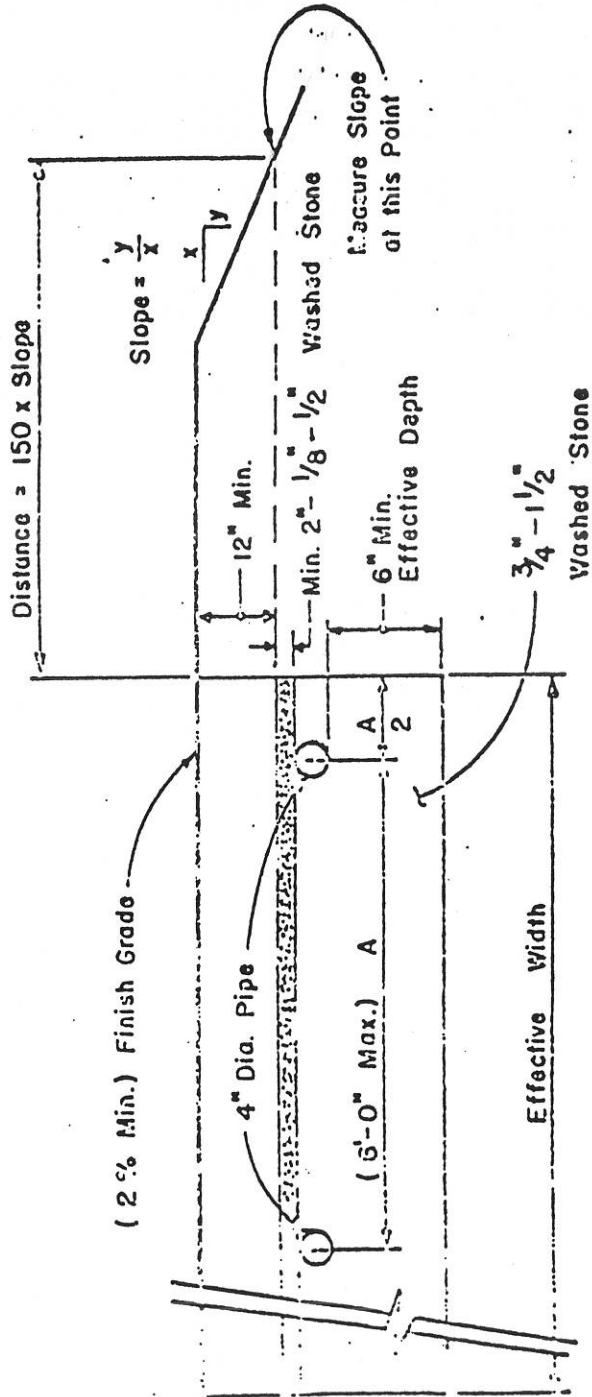
(13) Frozen Conditions. No field shall be constructed in frozen soil. Fields may be installed in cases where the construction elevation is below the depth of the frost line.

(14) Ventilation. Leaching field systems designed to be dosed must be vented at the downstream end of the system.

15.15: continued

FIGURE 1.

LEACHING FIELD (ILLUSTRATION C)



LEACHING FIELDS

No Scale

Illustration C

310 CMR: DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING

15.16: Privies and Chemical Toilets

(1) Use. A privy or chemical toilet shall not be constructed or continued in use unless the Board of Health has approved in writing, its construction or continued use based upon a determination by the Board of Health that the privy or chemical toilet will not (a) endanger the health of any person or, (b) cause a nuisance.

(2) Location. Privies shall be located in accordance with the requirements of 310 CMR 15.03. No variance from any of the percolation rate requirements or leaching area loading rates outlined in this Title shall be allowed for the disposal of grey water from a lot to be served by a privy or chemical toilet, but a reduction not to exceed 40% of the design flow for subsurface sewage disposal may be allowed for the reduced water usage.

(3) Construction. Privies shall be constructed with self-closing seat covers and fly-tight vaults, and with a screened vent from the vault to the atmosphere.

(4) Maintenance. When a privy vault becomes filled to within 2 feet of the surface of the ground, it shall either be cleaned and the contents disposed of in a sanitary manner approved by the Board of Health, or it shall be covered with a minimum of 2 feet of clean compacted earth.

15.17: Humus Toilets

(1) Use. A humus toilet shall not be constructed or continued in use unless the Board of Health has approved, in writing, its construction or continued use based upon determination by the Board of Health that the humus toilet will not endanger the health of any person or cause a nuisance and that the end product will be disposed of in a sanitary manner.

(2) Location. Humus toilets shall only be located where a full-sized properly functioning subsurface sewage disposal system is available or can be constructed on the lot to be served in compliance with this Title; or where a common sanitary sewer is accessible in an abutting way and where permission to enter such a sewer can be obtained from the authority having jurisdiction over it. No variance from any of the percolation rate requirements or leaching area loading rates outlined in this Title shall be allowed for the disposal of grey water from a lot to be served by a humus toilet, but a reduction not to exceed 40% of the design flow for subsurface sewage disposal may be allowed for the reduced water usage.

(3) Maintenance. The end product from a humus toilet must be disposed of by burial in a manner and location approved by the Board of Health, and it shall be covered with a minimum of 2 feet of clean compacted earth.

15.18: Miscellaneous Disposal

(1) Use. The use of any disposal facility other than those described herein is prohibited unless approved in writing by the Department of Environmental Quality Engineering. It is the intent of this Title that the Department shall approve innovative disposal systems if it can be demonstrated that their impact on the environment and hazard to public health is not greater than that of other approved systems. No variances to this regulation shall be granted.

(2) Drains. No rain water leader, cooling water drain, cellar drain, or other drain other than one for sanitary sewage shall discharge into or be connected with any sewage disposal system.

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15.18: continued

(3) Leaching catch basins. No leaching catch basins or dry wells designed for the collection of surface drainage shall be allowed within 25 feet of any leaching facility of a subsurface sewage disposal system.

15.19: Transportation and Disposal of Privy, Cesspool, and Septic Tank Contents

(1) Permits. No person shall engage in the pumping or transportation of the contents of privies, cesspools, septic tanks, or other offensive substances without first obtaining a permit from the Board of Health in accordance with G. L. c. 111, s. 31A and 310 CMR 15.02(3).

(2) Equipment. No person shall use equipment to remove or transport the contents of privies, cesspools, or septic tanks or other offensive substances unless such equipment has first been inspected and approved by the Board of Health.

(a) Mobile Tank. Mobile tanks shall be securely mounted on trucks. They shall be watertight and provided with a leak-proof cover and tight discharge valves.

(b) Venting of Mobile Tanks. Mobile tanks shall be provided with a vent constructed in a manner that will permit the escape of gas, but not the liquid contents of the tank.

(c) Hose. Suction or pressure hose shall be in good repair.

(d) Pumps. Pumps shall be maintained in a condition that will prevent the leakage of sewage.

(3) Disposal. Disposal of the substances listed in 310 CMR 15.19(1) shall be by discharge to a sanitary sewer or to works designed for the purpose. If disposal is by discharge into a sanitary sewer, it shall be in a manner and at such times as may be acceptable to the authority having jurisdiction over the sewer. If disposal is by works designed for the purpose, the area shall be in a location approved in writing by the Board of Health. The location and method of disposal must be approved in writing by the Department of Environmental Quality Engineering.

(4) Transportation. The contents of privies, cesspools, and septic tanks shall be transported in a manner that will not create a nuisance or a health hazard.

(5) Intercommunity Disposal. The contents of privies, chemical toilets, septic tanks, holding tanks, or other sewage or waste receptacles originating in any city or town may be disposed of in a sanitary manner in any other city or town subject to the written approval of the Boards of Health of the Municipalities in which the wastes originate and the disposal works are located, and the written approval of the Authority having control of the receiving sewer or disposal site. If disposal is into sewers tributary to the Metropolitan District Commission Sewerage System, written approval of the Commission shall also be obtained.

(6) Fees. A fee for the issuance of a permit for the pumping or transportation of the contents of privies, cesspools, septic tanks, or other offensive substances may be charged by the Board of Health at the time an application is made for the permit.

PART II ENFORCEMENT

15.20: Variance

Variations may be granted only as follows: The Board of Health may vary the application of any provisions of this Title (except where expressly forbidden elsewhere in this Title) with respect to any particular case when, in its opinion (1) the enforcement thereof would do

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15.20: continued

manifest injustice; and (2) the applicant has proved that the same degree of environmental protection required under this Title can be achieved without strict application of the particular provision.

Every request for a variance shall be made in writing and shall state the specific variance sought and the reasons therefore. No variance shall be granted for a new sewage disposal system, nor for an enlargement to an existing system which increases capacity to accommodate additional flows, except after the applicant has notified all abutters by certified mail at his own expense at least 10 days before the Board of Health meeting at which the variance request will be on the agenda. The notification shall state the specific variance sought and the reasons therefore. A variance may be issued for the repair of an existing sewage disposal system without the requirement of notification of all abutters by the applicant.

Any variance granted by the Board of Health shall be in writing. Any denial of a variance shall also be in writing and shall contain a brief statement of the reasons for the denial. A copy of each variance shall be conspicuously posted for thirty days following its issuance; and shall be available to the public at all reasonable hours in the office of the city or town clerk or the office of the Board of Health while it is in effect. Notice of the grant of each variance shall be filed with the Department of Environmental Quality Engineering, which shall approve, disapprove, or modify the variance within thirty days from receipt thereof. If the Department fails to comment within thirty days, its approval will be presumed. No work shall be done under any variance until the Department approves it or thirty days elapse without its comment, unless the Board of Health or the Department certifies in writing that an emergency exists.

15.21: Variance, Grant of Special Permission: Expiration, Modification, Suspension of

Any variance or other modification authorized to be made by this Title may be subject to such qualification, revocation, suspension, or expiration as the Board of Health or Department of Environmental Quality Engineering expresses in its grant. A variance or other modification authorized to be made by this Title may otherwise be revoked, modified, or suspended, in whole or in part, only after the holder thereof has been notified in writing and has been given an opportunity to be heard, in conformity with the requirements of Title 1 (310 CMR 11.00) for orders and hearings.

15.22: General Enforcement

The provisions of Title 1 of this Environmental Code (310 CMR 11.00) shall govern the enforcement of this Title as supplemented by the following Regulations.

15.23: Orders: Service and Content

(1) If an examination as provided for in Title 1 (310 CMR 11.00) reveals failure to comply with the provisions of this Title, the Board of Health or Department of Environmental Quality Engineering shall order the persons responsible to comply with the violated provision.

(2) Every Order authorized by this Title shall be in writing. Orders issued under the provisions of 310 CMR 15.23(1) shall be served on all persons responsible for the violated regulations. All Orders shall be served on the designated person:

(a) Personally, by any person authorized to serve civil process,
or

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15.23: continued

- (b) By leaving a copy of the Order at his last and usual place of abode, or
 - (c) By sending him a copy of the Order by registered or certified mail, return receipt requested, if he is within the Commonwealth, or
 - (d) If his last and usual place of abode is unknown or outside the Commonwealth, by posting a copy of the Order in a conspicuous place on or about the affected premises.
- (3) Subject to the emergency provision of Title 1, any Order issued under the provision of this Title shall:
- (a) Include a statement of the violation or defect, and may suggest action which, if taken, will effect compliance with this Title, and
 - (b) Allot a reasonable time for any action it requires, and
 - (c) Inform the person to whom it is directed of his right to a hearing and of his responsibility to request the hearing, and to whom the request shall be made.

15.24: Hearing

- (1) Procedure for Requesting and Holding Hearing. Unless otherwise specified in this Title, the person or persons to whom any order has been served pursuant to any Regulation of this Title may request a hearing before the Agency that issued the order by filing with said Agency within 7 days after the day the order was served a written petition requesting a hearing on the matter. Upon receipt of such petition, the Agency shall set a time and place for such hearing and shall inform the petitioner thereof in writing. The hearing shall be commenced not later than 45 days after the day on which the Order was served. The Agency, upon application of the petitioner, may postpone the date of hearing for a reasonable time beyond such 45 day period if in the judgement of the Agency the petitioner has submitted a good and sufficient reason for such postponement.
- (2) Hearing of Petitioner. At the hearing, the petitioner shall be given an opportunity to be heard and to show cause why the Order should be modified or withdrawn.
- (3) Procedure by the Agency after Hearing. After the hearing, the Board of Health or Department of Environmental Quality Engineering shall sustain, modify, or withdraw the Order and shall inform the petitioner in writing of its decision. If the Board of Health or Department of Environmental Quality Engineering sustains or modifies the Order, it shall be carried out within the time period allotted in the original Order or in the modification.
- (4) Public Record. Every notice, Order, or other record prepared by the Board of Health or Department of Environmental Quality Engineering in connection with the hearing shall be entered as a matter of public record in the office of the clerk of the city or town, or in the office of the Board of Health or Department of Environmental Quality Engineering.
- (5) Hearing Petition Not Submitted, or Sustaining of Order. If a written petition for a hearing is not filed with the Board of Health or Department of Environmental Quality Engineering within 7 days after the day an Order has been served or if after a hearing the Order has been sustained in any part, each day's failure to comply with the Order as issued or modified shall constitute an additional offense.

310 CMR: DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING

15.25: Appeal

Any person aggrieved by the decision of the Board of Health or Department of Environmental Quality Engineering may seek relief therefrom within 30 days in any court of competent jurisdiction, as provided by the laws of this Commonwealth.

15.26: Penalties

(1) Any person who shall violate any provision of this Title for which penalty is not otherwise provided in any of the General Laws or in any other provision of this Title or Title 1 of this Environmental Code (310 CMR 11.00) shall upon conviction be fined not less than 10 nor more than 500 dollars.

(2) Any person who shall fail to comply with any Order issued pursuant to the provisions of this Title shall, upon conviction, be fined not less than 10 nor more than 500 dollars. Each day's failure to comply with an Order shall constitute a separate violation.

15.27: Severability

Each Regulation in Part I and Part II of this Title shall be construed as separate to the end that if any regulation or sentence, clause, or phase thereof shall be held invalid for any reason, the remainder of that regulation and all other regulations shall continue in full force.

(310 CMR 15.28 through 15.98: RESERVED)

15.99: Forms

The following forms apply to all of 310 CMR 15.00.

15.99: Forms

..... SUGGESTED FORM

BOARD OF HEALTH

_____ MASSACHUSETTS

CERTIFICATE OF COMPLIANCE

THIS IS TO CERTIFY, That the Individual Sewage Disposal System
installed () or repaired () by _____ at _____
_____ installer
_____ has been constructed in accordance with the provisions of
Title 5 of The State Environmental Code as described in the application for
Disposal Works Construction Permit No. _____ dated _____

The issuance of this certificate shall not be construed as a guarantee that
the system will function satisfactory.

DATE _____ Inspector _____

BOARD OF HEALTH

_____ MASSACHUSETTS

DISPOSAL WORKS CONSTRUCTION PERMIT

No. _____

Permission is hereby granted _____ to construct ()
or repair () an Individual Sewage System at No. _____
as shown on the application for Disposal Works Construction Permit No. _____

Dated _____

DATE _____

Board of Health



The Commonwealth of Massachusetts

Executive Office of Environmental Affairs

Department of Environmental Quality Engineering

Division of Water Pollution Control

One Winter Street, Boston, Mass. 02108

Thomas C. McMahon
Director

TITLE 5 POLICY MEMORANDUM #87-1

TO: Boards of Health
Deputy Regional Environmental Engineers
Program Managers

SUBJECT: Side Slope Requirements
for Construction in
Fill

FROM: Mark K. Pare, P.E. *Mark Pare*
Chief, Ground Water Regulation Section

Illustrations A and B (Figure 1, 310 CMR 15.12 and 15.14) show "natural soil" around leaching pits, galleries, chambers and trenches. Section 15.02(17), however, allows leaching facilities to be constructed in fill material provided certain minimum criteria are satisfied. Questions have been raised about the method used to calculate the breakout prevention distance for facilities constructed in fill, and, in those cases where the fill material extends above natural grade, whether the slope as determined at the point of measurement must extend continuously until it meets natural grade.

When reviewing a proposed leaching facility which is to be constructed in fill, Figure 1 of Title 5 (Illustrations A, B, and C) shall apply. The location of disposal facilities in relation to adjacent downhill slopes is therefore determined by using the formula - distance = 150 x slope (y/x) - as shown on the illustrations.

A strict interpretation of this requirement would mandate that the slope, as measured at a point located along a line drawn as a horizontal extension of the top surface of the washed stone at the calculated distance, should extend continuously to meet the natural grade. This is best demonstrated by using, as an example, a case where a near vertical slope is encountered. The required separation distance, using the above equation, would approach infinity as the slope approaches the vertical.

In some cases this strict interpretation may cause undue hardship as maintaining the required slope may be impractical or even impossible for a particular site. In these cases one must not lose sight of the intent of this requirement. That is: to provide a simple and concise method for determining the required separation distance necessary to protect against surface breakout of the effluent. In the cases where the enforcement of the slope requirement would do manifest injustice, the applicant should demonstrate that the same degree of environmental protection against breakout can be achieved without strict application of this particular provision by performing a more detailed geohydrologic investigation of the site. A variance to the slope requirement could then be granted pursuant to 310 CMR 15.20. A retaining wall or other flow restrictive barrier may be considered in these instances.

MKP/wp



The Commonwealth of Massachusetts

Executive Office of Environmental Affairs

Department of Environmental Quality Engineering

Division of Water Pollution Control

One Winter Street, Boston, Mass. 02108

Thomas C. McMahon
Director

TITLE 5 POLICY MEMORANDUM #87-2

TO: Boards of Health
Deputy Regional Environmental Engineer
Program Managers

SUBJECT: Set Back Requirements
Slab Construction

FROM: Mark K. Pare, P.E. *Mark Pare*
Chief, Ground Water Regulation Section

310 CMR 15.03(7) provides that no septic system shall be closer than 10 feet and no leaching facility closer than 20 feet from a cellar wall. Buildings constructed on concrete slab foundations do not have cellar walls within the meaning provided in section 15.01. Slab foundations typically do not extend more than two feet into the ground and thus do not pose the problem of restricting horizontal ground water flow.

This office has, therefore, developed a policy that septic tanks and leaching facilities shall be separated a minimum distance of 10 feet from the outside edge of a slab foundation. This distance will provide for an adequate area for excavation of the subsurface disposal system components and will provide for the protection of public health should a failure occur.

MKP/wp



The Commonwealth of Massachusetts

Executive Office of Environmental Affairs

Department of Environmental Quality Engineering

Division of Water Pollution Control

One Winter Street, Boston, Mass. 02108

Thomas C. McMahon
Director

TITLE 5 POLICY MEMORANDUM #87-3

TO: Boards of Health
Deputy Regional Environmental Engineers
Program Managers

SUBJECT: Sizing of Grease
Traps

FROM: Mark K. Pare, P.E. *Mark Pare*
Chief, Ground Water Regulation Section

Grease traps shall be designed and constructed as noted in 310 CMR 15.05.

When determining the capacity of a grease trap, kitchen flow is calculated in accordance with 310 CMR 15.02(13), typically 15 gallons per seat or chair per day. This flow estimate is not to be added to the Title 5 flow estimate of 35 gallons per seat or chair per day used to size the septic tank and leaching facilities.

MKP/RJW/wp



The Commonwealth of Massachusetts

Executive Office of Environmental Affairs

Department of Environmental Quality Engineering

Division of Water Pollution Control

One Winter Street, Boston, Mass. 02108

Thomas C. McMahon
Director

TITLE 5 POLICY MEMORANDUM #87-4

TO: Boards of Health
Deputy Regional Engineer
Program Managers

SUBJECT: Use of Fiberglass
and Polyethylene Septic
Tanks

FROM: Mark K. Pare, P.E. *Mark Pare*
Chief, Ground Water Regulation Section

In response to the numerous inquiries received by the Department of Environmental Quality Engineering relative to the use of fiberglass and polyethylene septic tanks, this office has developed the following policy regarding the approvability of septic tanks constructed by these materials.

This office considers fiberglass and polyethylene to be sound and durable materials which can satisfy the provisions of 310 CMR 15.06(7) of Title 5 of the State Environmental Code. Therefore, fiberglass and polyethylene may be approved for use provided all other applicable provisions of section 15.06 are satisfied.

It is important to note that our review of the design features of septic tanks by various manufacturers of who utilize these materials has failed to reveal any apparent public health advantage over the more commonly used precast reinforced concrete tanks.

The following list of deficiencies noted by this office during its review of several different designs of fiberglass and polyethylene septic tanks may be used as a guide in reviewing a particular design for approval. These include:

1. Light-weight tanks could be subject to flotation in areas of high ground water. In installations of this type, buoyancy forces on the tank when empty should be calculated and ballast should be provided as appropriate. (This also applies to precast concrete tank installed under similar conditions);
2. Cylindrical & oval tank designs reduce the volume available for sludge and scum storage;
3. Rounded septic tank bottoms make it difficult to adequately compact backfill below the mid-depth of the tank;

4. Access manholes are difficult to adapt to cast iron frames and covers and to raise to finish grade or to within 12 inches of finish grade. Fiberglass and polyethylene covers are unsuitable in instances where covers are required to be at finished grade;
5. The structural data in some cases does not appear to preclude structural damage when a point load is imposed directly on an access cover at finished grade. All system components must be capable of withstanding H-10 wheel loads except in areas subject to vehicular traffic where an H-20 wheel load applies;
6. Accessibility of inlet and outlet tees from the access manhole extension may be difficult, impractical and/or impossible;
7. The distance between the outlet and inlet of the tank measured at the bottom of the tees must be at least equal to the liquid depth of the tank (4 feet minimum, preferably more on oval or circular tanks).

MKP/wp



The Commonwealth of Massachusetts

Executive Office of Environmental Affairs

Department of Environmental Quality Engineering

Division of Water Pollution Control

One Winter Street, Boston, Mass. 02108

Thomas C. McMahon
Director

TITLE 5 POLICY MEMORANDUM #87-5

TO: Boards of Health
Deputy Regional Environmental Engineers
Program Manager

SUBJECT: Leaching Facility
Set Back

FROM: Mark K. Pare, P.E. *Mark Pare*
Chief, Ground Water Regulation Section

Prior written approval of the Department of Environmental Quality Engineering will not be granted on new construction where less than the 100 feet minimum acceptable separation distance between the leaching facility and a well is provided.

Approvals for a lesser distance may still be considered for repairs to existing systems on a case by case basis. In these instances the Department's approval will be dependent upon a recording in the appropriate registry of deeds of a notice that discloses the existence of a variance for the sewage disposal system. Routine monitoring of the water quality at the well will be required.

MKP/wp

4. Access manholes are difficult to adapt to cast iron frames and covers and to raise to finish grade or to within 12 inches of finish grade. Fiberglass and polyethylene covers are unsuitable in instances where covers are required to be at finished grade;
5. The structural data in some cases does not appear to preclude structural damage when a point load is imposed directly on an access cover at finished grade. All system components must be capable of withstanding H-10 wheel loads except in areas subject to vehicular traffic where an H-20 wheel load applies;
6. Accessibility of inlet and outlet tees from the access manhole extension may be difficult, impractical and/or impossible;
7. The distance between the outlet and inlet of the tank measured at the bottom of the tees must be at least equal to the liquid depth of the tank (4 feet minimum, preferably more on oval or circular tanks).

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Department of Environmental Quality Engineering

Division of Water Pollution Control

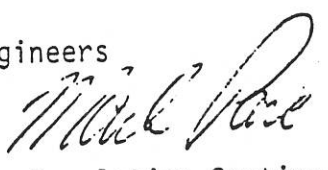
One Winter Street, Boston, Mass. 02108

Thomas C. McMahon
Director

TITLE 5 POLICY MEMORANDUM 87-6

TO: Boards of Health
Deputy Regional Engineers
Program Managers

SUBJECT: Sewage Pumping to
Septic Tank

FROM: Mark K. Pare, P.E. 
Chief, Ground Water Regulation Section

The Department may consider a proposal for the use of a pump to discharge sanitary sewage to a septic tank provided that only a small portion of the total sewage flow to the septic tank is pumped and that the pump used for such pumping is of a low volume capacity.

Written approval of the Department is required (310 CMR 15.06(18)).

MKP/RJW/wp



Thomas C. McMahon
Director

The Commonwealth of Massachusetts

Executive Office of Environmental Affairs

Department of Environmental Quality Engineering

Division of Water Pollution Control

One Winter Street, Boston, Mass. 02108

TITLE 5 POLICY MEMORANDUM #87-7

TO: Boards of Health
Deputy Regional Engineers
Program Managers

SUBJECT: Sanitary Sewage Tight Tank
Policy

FROM: Mark K. Pare, P.E. *Mark Pare*
Chief, Ground Water Regulation Section

Effective immediately, the tight tank policy of the Department adopted on February 24, 1977 is rescinded and the following policy is effective.

TIGHT TANK POLICY

1. Existing Situation - A tight tank may be approved under Regulation 18.1 of Title 5 of the State Environmental Code to eliminate an existing malfunctioning subsurface sanitary sewage disposal system when, in the opinion of the Regional Engineer having jurisdiction over subsurface sewage disposal, there is no other feasible alternative. Evidence must accompany application for approval showing proof of "no feasible alternative". Reasonable variances from the Code must be carefully considered prior to approval of any tight tank. The following design criteria will be used.
2. Design Criteria -
 - a. Size - 500% of the average daily flow, but in no case less than 2000 gallons.
 - b. Plans - Plans must be submitted by a Massachusetts Registered Professional Engineer for approval.
 - c. Alarms - Bell and light at three-fifths capacity in suitable convenient location. Transmission of the alarm signal to a locus manned 24 hours per day may be required.
 - d. Pumping - The application for approval must indicate the method and frequency of removal of the contents.

- e. Disposal of Contents - The specific location and method of disposal of the contents must be indicated and be in a proper manner at a location approved by agencies having jurisdiction.
 - f. Accessibility - All tight tanks must have at least one 24 inch diameter cast iron frame and cover at finished grade constructed so as to eliminate entrance of surface waters. Permanent suction piping may also be required.
 - g. Location - The tank shall be located so as to provide year-round access for pumping.
 - h. Permit - A permit to install the tank must be obtained from the local Board of Health under Title 5 of the State Environmental Code (or in accordance with the provisions of any successor code, law or regulation).
 - i. Monitoring - The local Board of Health must certify that the system will be monitored by them to see that it is being properly operated and maintained. Additional monitoring will be by Department of Environmental Quality Engineering personnel having jurisdiction over subsurface sewage disposal on a spot check basis or on complaint.
 - j. Ground Water - Tanks must be water proof and watertight and should not be located below the water table without extensive testing to prove the integrity of the tank and be designed against uplift.
 - k. Odor Control - Aeration or some other method of odor control may be required.
 - l. Reports - Monthly reports may be required to be submitted to the local Board of Health and/or the Department of Environmental Quality Engineering.
 - m. Certification - The tight tank shall not be utilized until written certification that it has been constructed in accordance with the approved plan has been submitted to the Department of Environmental Quality Engineering and the Board of Health. Said certification shall be submitted by a Professional Engineer who is registered in the Commonwealth of Massachusetts. Nothing in this provision is intended to interfere with the right of the Board of Health to inspect the holding tank at any time during construction in order to assess compliance with the approved plan.
3. Approvals - The Regional Engineer may approve (subject to the restrictions in paragraphs 6 and 7 below) all tight tank applications, an escrow account may be required to ensure availability of funds for continuity of maintenance. Escrow accounts will be in the name of the owner or person having control of the tight tank to be used when required by Department of Environmental Quality Engineering or the local Board of Health.

All replies approving tight tanks shall state that failure of the owner or person having control of the tank to keep it from overflowing and properly maintained will constitute grounds for revocation of approval for the use of such a unit. Approval will be limited to the existing use and any change of use or ownership will require a new approval but may not require new plans.

4. New Building - Tight tanks will not be approved for new construction except in connection with the marina license program of the Department of Environmental Quality Engineering when no feasible alternative exists.
5. Upon availability of a sewerage system, connection shall be made within 30 days and the tight tank system shall be abandoned.
6. Commercial Wastes - No approval for a tight tank at a commercial establishment shall be granted by the Regional Engineer without the prior consent of the Boston Office of the Division of Water Pollution Control.
7. Industrial Wastes - Holding tanks for non-hazardous, non-domestic industrial wastes may be approved by the Regional Engineer pursuant to the Industrial Waste Holding Tank Policy Memorandum dated October 7, 1985. No approval for a tight tank for sanitary waste at industrial facilities shall be granted without the prior consent of the Boston Office of the Division of Water Pollution Control.

MKP/wp



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Thomas C. McMahon
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TITLE 5 POLICY MEMORANDUM #87-8

TO: Boards of Health
Deputy Regional Engineers
Program Managers

FROM: Mark K. Pare, P.E.
Chief, Ground Water Regulation Section

SUBJECT: Foundation Drains

Mark K. Pare

This office considers foundation drains to be subsurface drains within the meaning provided in 310 CMR 15.01. Therefore, in those instances where foundation drains are utilized, the separation distances specified in section 15.03(7) for subsurface drains (25 feet for both septic tank and leaching facility where the drain does not lead to a surface water supply, or 50 feet for a septic tank and 100 feet for a leaching facility where the drain does lead to a surface water supply) shall apply. Since these separation distances are greater than those specified for a cellar wall, they would be the controlling factor on the location of subsurface disposal system components.

MKP/wp



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Thomas C. McMahon
Director

TITLE 5 POLICY MEMORANDUM #87-9

TO: Boards of Health
Deputy Regional Environmental Engineers
Program Managers

SUBJECT: Separate Grey Water
Disposal Areas

FROM: Mark K. Pare, P.E. *Mark Pare*
Chief, Ground Water Regulation Section

A separate disposal system for grey water is not recommended, however, if separate systems are proposed, both systems must contain all elements of a sanitary sewage disposal system required by Title 5 (septic tank, adequate leaching facility).

MKP/RJW/wp