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## 1996 Proposed Sewage Handling and Disposal Regulations

### 12 VAC 5-610-110. (Repealed.)

### 12 VAC 5-610-120. Definitions.

The following words and terms, when used in this chapter, shall have the following meanings, unless the context clearly indicates otherwise:

"Agent" means a legally authorized representative of the owner.

"Alluvial soil" means a soil developing from recently deposited alluvium and exhibiting essentially no horizon development or modification of the recently deposited materials.

"Alluvium" means mineral materials, either weathered or unweathered, that are transported by flowing water and deposited or redeposited in a flood-plain or marine terrace.

"Aquifer" means water-bearing portion of a geologic formation that transmits water.

~~"Bureau" means the Bureau of Wastewater Engineering, Division of Water Programs, State Health Department.~~

"Colluvial soil" means a soil developing from recently deposited colluvium and exhibiting essentially no horizon development or modification of the recently deposited materials.

"Colluvium" means an accumulation of soil material, or a mixture of stone fragments and soil material, deposited at the base of slopes or in depressional areas, primarily by gravity.

"Commissioner" means the State Health Commissioner or his subordinate who has been delegated powers in accordance with 12 VAC 5-610-40 B.

"District health department" means a consolidation of local health departments as authorized

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in ~~Title 32.1 § 21.1-31~~ § 32.1-31 C of the Code of Virginia as amended. (See APPENDIX A).

"Division" means the Division of Onsite Sewage and Water Services, Office of Environmental Health Services, State Health Department.

"Drainfield acre" means any imaginary square or rectangularly shaped area of land, consisting of 43,560 square feet, covering the area where a drainfield, or part of a drainfield, exists or is proposed. In the case of rectangularly shaped areas, the shortest side must be 75% (or more) of the length of the longest side.

"Existing construction" (with failing sewage disposal systems) means an existing structure where the sewage disposal system serving the structure has failed or is currently in violation of state law or regulations and requires correction.

"General approval" means approval granted to systems which are thoroughly proven and tested in terms of theory and application, such as a conventional drainfield, a low-pressure system or elevated sand mound, and which are described in Part IV (12 VAC 5-610-660 et seq.).

"Gray color" means a chroma-2 or less on the Munsell Color Chart.

"Impervious strata" means soil or soil materials with an estimated or measured percolation rate in excess of 120 minutes per inch.

"Local health department" means a branch of the State Health Department established in each city and county in accordance with ~~Title 32.1 § 32.1-30~~ of the Code of Virginia as amended (See APPENDIX A).

"Mass sewage disposal system" means a sewage disposal system or systems which will

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discharge effluent to a single absorption area or multiple absorption areas with or without combined flows, such that the loading rate exceeds 1,200 gallons per day for any drainfield acre.

"Mineral soil" means a soil consisting predominantly of, and having its properties determined predominantly by, mineral matter. A mineral soil usually contains less than 20% organic matter, but it may contain an organic surface layer up to 12 inches thick.

"New construction" means construction of a building for which a building permit is required.

"Office" means the Office of ~~Management for Community Health Services, State Health Department~~ Environmental Health Services.

"Owner" means the Commonwealth or any of its political subdivisions, including sanitary districts, sanitation district commissions and authorities, any individual, any group of individuals acting individually or as a group, or any public or private institution, corporation, company, partnership, firm or association which owns or proposes to own a sewerage system or treatment works.

"Paralithic" or "Cr" means partially weathered igneous, metamorphic, or sedimentary rock, with characteristics similar to rock, but which is not soft, loose, or friable like saprolite. When evaluated in place, it is compact and grinds when encountered by an auger but may be penetrated with an auger or backhoe.

"Person" means an individual, corporation, partnership, association or any other legal entity.

"Pump and haul" means any unusual circumstance wherein sewage is permitted to be transported by vehicle to a point of disposal. The term pump and haul includes all facilities and appurtenances necessary to collect and store the sewage for handling by a contractor having a valid sewage handling permit.

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"Rock" or "bedrock" means an aggregate of minerals which is usually consolidated, hard, dense or indurated and which may have one or more of the following characteristics: jointing, bedding planes, schistosity or strike and dip. Rock does not have soil structure and may in some instances be penetrable with a hand auger or rippable with a backhoe.

"Saprolite" means material weathered from igneous or metamorphic rock, without soil structure, which is soft, loose, and friable in place and can be penetrated easily with an auger. Saprolite is defined as a C horizon and may have potential to treat and dispose of effluent.

"Septage" means material accumulated in a pretreatment system (see 12 VAC 5-610-780 and 12 VAC 5-610-570) or privy.

"Sewage" means water carried and nonwater carried human excrement, kitchen, laundry, shower, bath or lavatory wastes separately or together with such underground, surface, storm or other water and liquid industrial wastes as may be present from residences, buildings, vehicles, industrial establishments or other places.

"Sewage disposal system" means a sewerage system or treatment works designed not to result in a point source discharge.

"Sewage handling" means the vehicular conveyance of sewage (See "Transportation" in § 32.1-163 of the Code of Virginia in APPENDIX A).

"Sewerage system" means pipe lines or conduits, pumping stations and force mains and all other construction, devices and appliances appurtenant thereto, used for the collection and conveyance of sewage to a treatment works or point of ultimate disposal.

"Shrink-swell soils" means soils with horizons that contain montmorillonite and other clays that excessively shrink upon drying and swell upon wetting.

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"Sink hole" means a depression in the topography without a surface outlet for drainage from the low point. Sink holes are common in areas containing limestone and generally result from the collapse of solution cavities.

"Soil" means the weathered mineral fraction of the earth's mantle, which is less than or equal to 2.0 mm in size as measured in place. Soil is comprised of sands, silts or clays or combinations of these textures and may contain larger aggregate materials such as rock or paralithic material. Soil includes the A, B, C, and E horizons.

"Soil horizon" means a layer of soil or soil material approximately parallel to the land surface and different from adjacent genetically related layers in physical, chemical, and biological properties or characteristics such as color, structure, texture, consistency, kinds and numbers of organisms present, degree of acidity or alkalinity, etc.

"Subdivision" means multiple building lots derived from a parcel or parcels of land.

"Subsurface soil absorption" means a process which utilizes the soil to treat and dispose of effluent from a treatment works. (Also see "Subsurface Drainfields APPENDIX A drainfield" in § 32.1-163 of the Code of Virginia).

"Treatment works" means any device or system used in the storage, treatment, disposal or reclamation of sewage and industrial wastes, including but not limited to pumping, power and other equipment and appurtenances, septic tanks and any works, including land, that are or will be (i) an integral part of the treatment process or (ii) used for ultimate disposal of residues or effluent resulting from such treatment.

**12 VAC 5-610-150. ~~Effective date of regulations.~~ (Repealed.)**

~~The effective date of these regulations is November 1, 1982, except as noted in paragraphs~~

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A and B below.

~~A. The effective date for those parts of sections or the sections of the regulations pertaining to the requirements for a sewage handling permit is January 1, 1983.~~

~~B. The effective date for those parts of sections, or the sections of the regulations pertaining to the requirements for an approved disposal site for the handling and treatment of septage is January 1, 1985.~~

~~C. Where the applicant can demonstrate that approved public or private sewage treatment facilities are not reasonably available to handle the disposal and treatment of septage, and the applicant has submitted a plan by October 1, 1984, that sets forth specific action steps (including dates) for compliance with 12 VAC 5-610-380 D, then the effective date listed under paragraph B of this section may be extended until July 1, 1985.~~

**12 VAC 5-610-170. Enforcement regulations.**

All sewage handling and disposal facilities shall be constructed and operated in compliance with the requirements as set forth in this chapter.

A. Notice. Subject to the exceptions indicated below whenever the commissioner or the district or local health department has reason to believe a violation of any of these regulations has occurred or is occurring, the alleged violator shall be notified. Such notice shall be made in writing, shall be delivered personally or sent by certified mail, shall cite the regulation or regulations that are allegedly being violated, shall state the facts which form the basis for believing the violation has occurred or is occurring, shall include a request for a specific action by the recipient by a specified time and shall state the penalties associated with such violations (See ~~APPENDIX A~~ § 32.1-27 of the Code of Virginia). When the commissioner deems it

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necessary he may initiate criminal prosecution or seek civil relief through mandamus or injunctive relief prior to giving notice.

B. Pursuant to the authority granted in § 32.1-26 of the Code of Virginia the commissioner may issue orders to require any owner to comply with the provisions of this chapter. The order shall be signed by the commissioner and may require:

1. The immediate cessation ~~and/or~~ or correction, or both, of the violation;
2. The acquisition or use of additional land, equipment, supplies or personnel to insure that the violation does not recur;
3. The submission of a plan to prevent future violations to the commissioner for review and approval;
4. The submission of an application for a variance; and
5. Any other corrective action deemed necessary for proper compliance with the regulations.

C. Hearing before the issuance of an order. Before the issuance of an order described in ~~paragraph~~ subsection B of this section, a hearing must be held, with at least 30 days notice to the affected owner of the time, place and purpose thereof, for the purpose of adjudicating the alleged violation or violations of these regulations. The procedure at the hearing shall be in accordance with 12 VAC 5-610-200 B ~~of the regulations~~ and with §§ 9-6.14:10 through 9-6.14:12 of the Code of Virginia.

D. ~~Order when~~ Order; when effective. All orders shall become effective not less than 15 days after mailing a copy thereof by certified mail to the last known address of the owner

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violating this chapter. Violation of an order is a misdemeanor. (See § 32.1-27 of the Code of Virginia (~~APPENDIX A~~.)

E. Compliance with effective orders. The commissioner may enforce all orders. Should any owner fail to comply with any order, the commissioner may:

1. Apply to an appropriate court for an injunction or other legal process to prevent or stop any practice in violation of the order;
2. Seek mandamus against any owner that is a municipal corporation;
3. Request the Attorney General to bring an action for civil penalty;
4. Request the Commonwealth's Attorney to bring a criminal action.

F. Not exclusive means of enforcement. Nothing contained in this section shall be interpreted to require the commissioner to issue an order prior to seeking enforcement of any regulations or statute through an injunction, mandamus or criminal prosecution.

**12 VAC 5-610-250. Procedures for obtaining a construction permit for a sewage disposal system.**

Construction permits are issued by the commissioner but all requests for a sewage disposal construction permit shall be directed initially to the district or local health department.

A. Type I. A Type I sewage disposal system is an individual sewage disposal system incorporating a septic tank and subsurface soil absorption (septic tank-subsurface drainfield) serving a single residence. The submission of an application is all that is normally necessary to initiate procedure for obtaining a permit under this subsection. If after a site investigation, it is determined that pumping, enhanced flow distribution (see 12 VAC 5-610-930 A) or low pressure

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distribution (see 12 VAC 5-610-940) is necessary, the system shall be considered a Type II system.

B. Type II. A Type II sewage disposal system is a sewage disposal system incorporating a septic tank and resurface soil absorption system which serves a commercial or other establishment, more than a single family dwelling unit, or where pumping, enhanced flow distribution (see 12 VAC 5-610-930 A) or low pressure distribution (see 12 VAC 5-610-940) is necessary. The procedure for obtaining a permit includes the following steps:

1. The submission of an application;
2. A preliminary conference as necessary; and
3. The submission of informal plans, specifications, design criteria, and other data, as may be required by the district or local health department. Depending on the size and complexity of the system, the submission of formal plans and specifications may be required.

C. Type III. A Type III sewage disposal system is a sewage disposal system other than a septic tank subsurface soil absorption system or a privy. The procedure for obtaining a permit under this subsection includes the following steps:

1. The submission of an application;
2. A preliminary conference; and
3. The submission of formal plans, specifications and design criteria. Other supporting data may be required on a case-by-case basis. In the case of septage disposal facilities the plans and specifications shall include sufficient land area for disposal of the design

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production volume accumulated during a year long operating period. For the purpose of compliance with § 32.1-164.2 of the Code of Virginia, as amended, relating to land disposal of stabilized septage, local government will be notified by the department following satisfactory completion of steps 1 and 2 listed above.

D. Type IV-Privies. The submission of an application is all that is normally necessary to initiate the procedure for obtaining a permit under this section.

E. Application.

1. All applications for any type sewage disposal system except a special facility for handling and disposal of septage shall be made on an application form provided by the district or local health department and approved by the department. ~~A copy of a model form can be found in APPENDIX B.~~

2. Applications for special facilities for handling and disposal of septage shall be in letter form to the department requesting permission to establish a septage disposal facility.

F. Preliminary conference. A preliminary conference with the district or local health department will be held for Type II and Type III systems. When a Type III system for septage disposal is planned, the conference shall be with the department. At such conference the owner and/or his agent shall be prepared to set forth the sewage disposal problems and the proposed solution in such a manner to support his conclusions and recommendations.

G. Formal plans.

1. All formal plans for sewage disposal systems shall bear a suitable title showing the name of the owner and shall show the scale in feet, a graphical scale, the north point, date, and the name of the licensed professional engineer by or under whom prepared.

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The cover sheet and each plan sheet shall bear the same general title identifying the overall sewage disposal project and each shall be numbered. Appropriate subtitles should be included on the individual sheets.

The plans shall be clear and legible. They shall be drawn to a scale which will permit all necessary information to be plainly shown. The size of the plans should be no larger than 30 inches by 48 inches. Data used should be indicated. Location, when made, shall be shown on the plans. Logs of test borings shall be given either on plans or in the specifications.

Detailed plans shall consist of plan views, elevations, sections, and supplementary views which together with the specifications and general layouts provide the working information for the contract and construction of the work, including dimensions and relative elevations of structures, the location and outline form of equipment, the location and size of piping, water levels, ground elevations, and erosion control abatement facilities.

2. Geographical and other features. Topography, elevations (contour lines), existing or proposed streets and all bodies of water, ditches, buildings, springs, cisterns and wells within 100 feet horizontally of the proposed sewage disposal system site and/or well, and all property lines shall be clearly shown.

3. General layout. The general layout shall show the following:

- a. Test borings, groundwater elevation (if observed), and soil profiles;
- b. Size and location of sewage disposal systems;
- c. Schematic flow diagram showing the flow through the various disposal system units;

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d. Piping; and

e. Hydraulic profile showing the flow of sewage.

4. Detailed plans. Detailed plans shall show the following:

a. Location, dimensions and elevations of existing or proposed system facilities;

b. Pertinent data concerning the rated capacity of pumps, blowers, motors and other mechanical devices. All or part of such data may be included in the specifications by suitable reference on the plans;

c. Average and maximum hydraulic flow in profile; and

d. Adequate description of any features not otherwise covered by the specifications.

H. Formal specifications. Complete technical specifications for the construction of the sewage disposal system and all appurtenances shall accompany the plans. The specifications accompanying construction drawings shall include, but not be limited to, all construction information not shown on the drawings, which is necessary to inform the builder in detail of the design requirements as to the quality of material workmanship and fabrication of the project, type, size, strength, operating characteristics, and rating of equipment; allowable infiltration, machinery, valves, piping, and jointing of pipe, electrical apparatus, wiring and meters; operating tools and construction materials; special filter materials such as stone, sand, gravel or slag; miscellaneous appurtenances; chemicals when used; instructions for testing materials and equipment as necessary to meet design standards and operating test for the complete works and component units.

I. Special requirements for certain sewage disposal systems. A construction permit for a

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single sewage disposal system proposed to serve a dwelling unit with multiple living units, multiple dwelling units or multiple lots with dwelling units shall be issued only to a single owner. The owner shall provide legal documentation to insure operation and the maintenance of the system for the expected life of the living units or dwellings.

J. Construction permit with conditions.

1. Definition: Conditional construction permit means a permit authorizing the installation of a septic tank subsurface soil absorption system which does not fully conform to the criteria in Part IV (12 VAC 5-610-660 et seq.) of this chapter pertaining to septic tank size, subsurface soil absorption system size and certain groundwater table conditions as indicated by soil evaluation, but which, under the conditions to which the permit is subject, can be reasonably expected to function without danger to public health.

2. The purpose of this section is to allow for the issuance of conditional construction permits. Procedures for obtaining a conditional construction permit are the same as those contained in ~~paragraphs~~ subsections A, B, C and D of this section.

3. Conditional construction permits may be issued for any one or more of the following use conditions when satisfactory substantiation is provided by the applicant:

- a. Reduced water flow based on permanent water saving plumbing devices;
- b. Limitations on the number of persons occupying the dwelling or using the facility served by the proposed septic tank system;
- c. Intermittent or seasonal use of the dwelling or facility served by the septic tank system; and

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d. Temporary use of the septic tank system for a specified time period not to exceed one year. Such permits may be renewable when the commissioner determines there is a good cause for renewal.

4. Criteria.

a. The septic tank and/or drainfield size may be reduced based on the use conditions contained in subdivision 3 a, b, c, or d above of this subsection.

b. In areas with seasonal fluctuating water table(s), where the seasonally high water table would cause failure if the system were to be used continuously, septic tank systems may be installed when the period of use of the septic tank system coincides with the period when the groundwater table, as indicated by free water, is at its lowest level. Acceptable separation distances to free standing groundwater shall be as follows:

Minimum Separation Distances to Seasonal Water Table

<u>Percolation Rate</u>	<u>Distance from Trench Bottom</u>
<u>Minutes/Inch</u>	<u>Inches</u>
<u>5</u>	<u>2</u>
<u>17</u>	<u>3</u>
<u>46</u>	<u>12</u>
<u>90</u>	<u>18</u>
<u>120</u>	<u>20</u>

Table 2.1

Minimum Separation Distances to Water Table

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<u>Texture Group</u>	<u>Percolation Rate (minutes per inch)</u>	<u>Separation Distance (inches)</u>	
		<u>without pretreatment</u>	<u>with pre- treatment<sup>1</sup></u>
<u>Group I</u>	<u>1 to 16</u>	<u>24</u>	<u>18</u>
<u>Group II</u>	<u>17 to 45</u>	<u>18</u>	<u>12</u>
<u>Group III</u>	<u>46 to 90</u>	<u>18</u>	<u>12</u>
<u>Group IV</u>	<u>90 to 120</u>	<u>18</u>	<u>12</u>

<sup>1</sup>Pretreatment in this context refers to sewage that has been treated to reduce both BOD and suspended solids to 30 mg/l or less.

c. Because of the increased risk of failure, a conditional permit shall not be issued, in an area with a seasonally fluctuating water table if the proposed absorption area is within 200 feet of a shellfish growing area, recreational waters or a public water supply impoundment.

5. The district or local health department shall affix to the conditional construction permit a clear and concise statement relating the conditions and circumstances which formed the basis for issuing the conditional permit as well as the owner's obligations under the permit.

6. The holder of any conditional construction permit shall have the permit recorded and indexed in the grantee index under the holder's name in the land records of the clerk of the circuit court having jurisdiction over the site of the septic tank system. District or local health departments shall be provided with certification that the conditional septic tank system permit has been recorded in the land records of the circuit court. The conditional permit shall become effective one day after the district or local health department receives notification of recordation. The district or local health department shall advise the local building official that conditional septic tank system permits are not valid without certification that the permits have been properly recorded as required and shall forthwith

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notify the local building official when the conditional permit becomes effective. Final approval of the construction of the septic tank subsurface soil absorption system shall not be given until or unless the system is constructed in accordance with the conditions of the permit. The operation permit will be issued in accordance with 12 VAC 5-610-340.

7. As per § 32.1-164.1 of the Code of Virginia, the holder of the permit and any subsequent holders of the permit shall be bound by the conditions stated in the permit unless the holder or subsequent holder obtains an additional permit for modification or alteration of the septic tank system to meet any new use conditions.

**12 VAC 5-610-260. Requirements for the submission of formal plans, specifications and other data.**

A. In accordance with the provisions of Title 54.1 of the Code of Virginia, ~~§§ 54-17.1 through 54-44~~ all formal drawings, specifications, reports, and other documents submitted for approval shall be prepared by or under the supervision of a licensed professional engineer. The front cover of each set of drawings, of each copy of data and each copy of the specifications submitted shall bear the original imprint of the seal and signature of the licensed professional engineer by or under whom prepared. In addition each drawing submitted shall bear an imprint or a legible facsimile of such seal.

B. If revisions to the formal plans, specifications or documents are necessitated, a letter will be sent to the engineer outlining the revisions and requesting submission of the revised documents within 30 calendar days.

**12 VAC 5-610-370. Special permits for experimental methods, processes and equipment.**

A. New construction. Sewage treatment and disposal methods, processes, and equipment

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which (i) are not covered by criteria in Part IV (12 VAC 5-610-660 et seq.) and which (ii) in principle and/or application are new or unconventional are subject to a special permitting procedure in lieu of that set forth in 12 VAC 5-610-250. All applications for such processes, methods, and equipment shall be made to the bureau division through the district or local health department.

1. Submission of data on experimental methods, processes, and equipment. The policy of the bureau division is to encourage the development of any new methods, processes, and equipment which appear to have application for the treatment and disposal of sewage; however, new developments shall have been thoroughly tested in a full scale or representative pilot system utilizing this process and equipment. Results of this testing must be submitted to the bureau division. The testing required on new developments will generally follow these guidelines:

- a. All procedures used in validating the process shall be conducted under the supervision of an accredited university, a licensed professional engineer experienced in the field of sanitary engineering, or by a testing firm acceptable to the bureau division;
- b. The tests shall be performed under maximum design conditions and over extended periods of time in the geographical area of the proposed installation;
- c. The data shall be from a continuous operation of a full scale or pilot installation treating or conveying the type of sewage to be handled;
- d. Flow measuring equipment shall be provided and total flow shall be recorded daily;
- e. The minimum sampling and analysis program will be established by the bureau

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division in accordance with the process under investigation; and

f. All analyses will be made in accordance with ~~the current edition of~~ Standard Methods for Examination of Water and Wastewater, 1992 (American Public Health Association), or analytical methods approved by the ~~bureau~~ division.

g. The sampling shall establish the impact of the experimental sewage treatment and disposal methods, processes, or equipment on ground water and public health.

2. Detailed plans must be submitted showing how in case of noncompliance, the method, equipment or process will be converted to or replaced with a proven system. In order to assure that funds are available to convert or replace the experimental method, equipment or process with a proven system, bonding or other assurances shall be provided. A proven system shall be a Type I, II, or III system, a point source discharge system or connection to an existing approved sewerage system or treatment works. The application for the experimental system shall be accompanied by one of the following: (i) ~~an application for a National~~ Virginia Pollution Discharge Elimination System (NPDES VPDES) permit, or (ii) a General Permit Registration Statement issued by the State Water Control Board and a construction permit for an alternative discharging sewage treatment system issued by the commissioner, certification from the owner of the existing sewage system or treatment works that connection is available or a valid construction permit for a Type I, II, or III system.

3. Issuance of a construction permit. After review of the plans and testing data by the ~~bureau~~ division and approval of a proven system (see ~~subsection A~~ subdivision 2 of this chapter subsection) the commissioner shall issue a construction permit in accordance

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with the procedures of such in 12 VAC 5-610-250, if reasonably satisfied that the method, process, or equipment will provide satisfactory sewage disposal.

4. Issuance of an experimental operation permit. Upon completion of construction or modification, a permit to operate for a definite period of time will be issued for the operation of the provisionally approved methods, processes and equipment. The number of experimental systems of similar design characteristics to be installed for an evaluation period shall be determined by the bureau division and where soil dependent systems are utilized the number shall be limited to not more than four ~~(4)~~ for each physiographic province (See Appendix K). There shall be no limit on the number of experimental systems allowed to be installed when an approved back-up system is constructed in accordance with subdivision 2 of this subsection, and plumbing is provided to the back-up system. In this instance, a flow diversion valve shall be installed to divert wastewater flow between the two systems as necessary. The provisional permit to operate the experimental system shall require that ~~(4)~~ the evaluation period shall be a minimum of 18 months and no longer than 36 months, under design conditions, and ~~(2)~~ the holder of the experimental operation permit shall submit reports on operation during the evaluation period as required by the bureau division.

5. Issuance of an operation permit. The commissioner shall issue an operation permit upon expiration of the experimental permit if, on the basis of testing during that period, the bureau division finds that the experimental method, processes or equipment provides satisfactory sewage disposal. If these conditions are not met, then the commissioner shall issue an order which will require the owner to alter the sewage disposal system in a manner that will enable the conditions to be met.

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B. Existing construction. Sewage treatment and disposal methods, processes and equipment which (i) are not covered by the criteria in Part IV (12 VAC 5-610-660 et seq.) of this chapter and which (ii) in principle and/or application are new or unconventional may be utilized where a conventional sewage disposal system serving an occupied dwelling has failed and it is not possible to provide an alternate sewage disposal system having a discharge to state waters. The procedures for obtaining a permit for such systems shall generally follow those set forth in subsection A of this section with the following exceptions:

1. The detailed plans required need not show how in case of nonacceptance, the sewage disposal system will be converted to or replaced with a proven process nor are bonds or assurances required;
2. More than four permits for soil dependent experimental systems of similar design characteristics may be issued per physiographic province; and
3. If the disposal system fails to work satisfactorily on a year round basis, further correction to the system may be required.

C. Waiver of issuance of an experimental operating permit. Sewage treatment and disposal methods, processes and equipment which have been tested and have demonstrated operational competence, to the satisfaction of the commissioner, but are not covered by criteria in Part IV ~~of this chapter~~ (12 VAC 5-610-660 et seq.), shall be waived from the requirements of subsections A and B of this section and shall be subject to the requirements of 12 VAC 5-610-250. If the wastewater to be treated is substantially different in flow and/or characteristics from one which was used during testing, the commissioner shall require that an experimental operating permit be issued and further testing conducted until operational competence is demonstrated.

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D. Issuance of design and construction criteria. When sewage treatment and disposal methods, processes and/or equipment have demonstrated operational competence to the satisfaction of the commissioner, provisional system approval shall be granted and design and construction criteria shall be developed in Part IV of this chapter when deemed appropriate in accordance with Article 2 (12 VAC 5-610-441 et seq.) of this part. The criteria shall include as a minimum the siting criteria, design and installation standards, performance, monitoring and service requirements of the methods, processes and equipment.

Article 2.

Systems with Provisional Approval.

**12 VAC 5-610-441. Provisionally approved systems; overview.**

A. Sewage treatment and disposal systems, methods, processes, technology and equipment that are not covered by criteria in Part IV (12 VAC 5-610-660 et seq.) and have not received general approval for use under the provisions of these regulations may be eligible for provisional approval. Depending upon the complexity of system, method, process, technology or equipment, provisional approval may be granted requiring individual applications for either a Type II or Type III system, as described in 12 VAC 5-610-250. After the evaluation period described in 12 VAC 5-610-445, a provisionally approved system may be given general approval and be incorporated into the regulations.

B. The purpose of the provisional approval process is to use, evaluate, and develop criteria for the use of new and innovative technology. The evaluation process allows the department a realistic amount of time, under true field conditions, to develop and refine siting, construction, operation and maintenance criteria applicable to conditions and uses occurring in Virginia.

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During this evaluation period, residents of the Commonwealth have the benefit of the systems and the department can review, evaluate, revise and refine all aspects of criteria related to the system.

**12 VAC 5-610-442. Applying for provisional approval.**

A. Applications for provisional approval shall be made in writing to the division and shall request provisional approval for a specific system, technology, method or process. The application shall comply with 12 VAC 5-610-240 regarding the submission of detailed plans and specifications.

B. The application shall include the following:

1. A description of the system's operation including the accepted scientific and engineering principles upon which the system technology, method or process is based.
2. A description of the site criteria required for successful operation of the system.
3. Design criteria for sizing the system to meet all relevant site conditions and waste flow characteristics.
4. Construction procedures for successfully installing a system.
5. Operation criteria and maintenance requirements for the successful use of the system over the life expectancy of the system.
6. Proposed performance standards that the system is expected to meet to determine the success or failure of the system.
7. Documentation giving factual evidence that the system has at least a reasonable potential for treating and disposing of effluent, and that the system granted has

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competency beyond experimental status but it does not need to demonstrate full competency.

8. Documentation of at least 50 comparable systems of identical design and capacity having been installed in Virginia or other states. Only systems installed under similar soil and site conditions (if applicable) to the site and soil conditions for which approval is sought in Virginia shall be considered. Additionally, the wastewater flows, strength and other characteristics shall be similar in both the demonstration systems and the proposed use in the provisional application.

9. Data indicating that the 50 systems identified in subsivision 8 of this subsection have provided both treatment and disposal equivalent to a conventional septic tank-drainfield system over a period of time not less than three years.

10. Test results and certifications conducted by an accredited college or university, the National Sanitation Foundation, entities accredited by the American National Standards Institute, or other testing groups that may be acceptable to the division and the Sewage Handling and Disposal Advisory Committee as being impartial and competent in testing or evaluating wastewater treatment and disposal methods.

C. An application submitted according to this section and containing all of the above information shall be considered a completed application.

**12 VAC 5-610-443. Evaluation process for provisional system applications.**

A. Preliminary evaluation. Upon receiving an application, the division shall review it for completeness. The division shall request additional information from the applicant if the application does not contain all of the requested information. Once the application is complete,

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the division shall prepare a summary and a preliminary evaluation of the proposal.

B. Review by advisory committee. The division shall present its summary and preliminary evaluation to the Sewage Handling and Disposal Advisory Committee. The applicant shall be invited to attend the meeting and make a presentation to the committee. The committee shall review the application, the division's summary and preliminary evaluation, and any additional information presented at the meeting. The purpose of the committee's review is to ensure that the perspectives and expertise of the committee are provided to the department and are included in the department's decision making process. After review and consideration of the application, the advisory committee shall make a report to the division making a recommendation that the commissioner approve, deny or request additional information on the application. Further the committee report shall include the basis for the recommendation.

C. Division evaluation and recommendation. The division shall evaluate all completed applications and make a recommendation to the commissioner concerning the application. The recommendation, if favorable, shall include proposed criteria for installing, operating and maintaining the system. The division shall consider the following:

1. Whether the demonstrations and test results required by 12 VAC 5-610-442 to be included in the application have been met and are satisfactory.
2. The impact of the system on ground water and public health.
3. The comments and recommendations of the Sewage Handling and Disposal Advisory Committee.
4. The operation of the system in other states. The division shall solicit evaluations and comments from health officials in other states where the system, method, process,

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equipment or technology has been used. Whenever possible, comments shall be solicited from field environmental health specialists with first hand experience, and from the appropriate individual or individuals in the state regulatory agency with responsibility for evaluating new methods and technologies.

5. A review of the manufacturer's or the distributor's records relating to system maintenance and customer complaints. Failure to maintain accurate and up-to-date records of maintenance actions and customer complaints may delay or prevent completing a product review.

6. A review of any sample results which may be collected from or around any of the systems.

7. The practicability of preventative maintenance and the frequency of the required maintenance.

8. Other information as deemed appropriate by the division which relates to evaluating the effect of the system, method or process on ground water or public health.

D. Decision by commissioner. In making a decision, the commissioner shall review the recommendations of the division, and the comments and recommendations made by the advisory committee. The commissioner may elect to approve or deny the application, or approve the application with conditions or with requirements for additional testing. The commissioner's provisional approval shall set forth the criteria for filing an application (i.e., Type II or Type III system), installing, operating, maintaining and testing the provisionally approved system. The commissioner may limit the number of any specific type of provisionally approved system that may be permitted. The commissioner's approval shall indicate that the provisional

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approval may be modified as set forth in 12 VAC 5-610-446 D.

**12 VAC 5-610-444. Appeals.**

A. Denial of provisional status. Pursuant to the Administrative Process Act (§ 9-6.14:1 et seq. of the Code of Virginia), any aggrieved applicant seeking provisional approval for a specific type of system may appeal the final case decision of the commissioner to an appropriate circuit court.

B. Denial of an applicant for use of a provisionally approved system. Aggrieved applicants who have been denied use of a system having provisional approval may request a hearing in accordance with 12 VAC 5-610-210.

**12 VAC 5-610-445. Permits for constructing and operating provisionally approved systems.**

A. Construction permit application. Homeowners can apply for a construction permit to install a provisionally approved system in the same manner provided for in 12 VAC 5-610-250 for Type II or Type III systems depending upon the nature of the provisional approval granted by the commissioner. Appeals from the denial of a permit application for a provisionally approved system shall conform to the requirements of 12 VAC 5-610-210.

B. Operation permit status. Homeowners installing a provisionally approved system in accordance with the construction permit issued by the commissioner and provisional siting, design and construction criteria for that system shall be issued an operation permit. Such operation permit shall be valid until the system ceases to operate in a safe and sanitary manner, as determined by the department. The validity of any individual operation permit, issued for a system having provisional approval, shall not be dependent upon ultimate approval or denial of

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that specific type of provisionally approved system for general approval under these regulations.

C. Recordation. All permits for provisionally approved systems shall be recorded with the clerk of the circuit court in the county where the system is permitted in accordance with 12 VAC 5-610-250 J 6.

D. Repair area. A 100% repair area, meeting or exceeding the requirements of these regulations, or an approved discharge permit, shall be identified prior to permitting a site for a provisional system. The repair area shall be reserved for the exclusive use of the repair system. A 100% repair area meeting the requirements of the provisional approval shall be considered adequate toward meeting this repair area provision.

E. Maintenance. Whenever deemed appropriate by the commissioner, the department shall require operation and maintenance procedures and schedules appropriate for the method proposed.

**12 VAC 5-610-446. Evaluation period for provisionally approved system.**

A. Evaluation criteria. Prior to receiving general approval and being incorporated into these regulations, systems with provisional approval shall be evaluated for not less than five years. An annual review shall normally be completed for systems with provisional approval. The review, at a minimum, shall include the following:

1. A field review of a sample of the systems installed. The sample shall include a representation of systems of newer and older installations and systems installed under different site and system limitations. System limitations will frequently be unique to each system and therefore the criteria used to select systems of different manufacturers will vary according to the nature and design of the system. The division shall determine the

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sample size to be evaluated and the criteria for sample selection.

2. An interview with a sample of system owners to determine customer satisfaction and customer opinions. This sample may or may not be the same as the sample of systems reviewed under 12 VAC 5-610-441 B 1.

3. A review of the manufacturer's or the distributor's records relating to system maintenance and customer complaints. Failure to maintain accurate and up-to-date records of maintenance actions and customer complaints may delay or prevent completing a product review.

4. A review of any sample results which may be collected from or around any of the systems.

5. Other information as deemed appropriate by the division which relates to evaluating the effect of the system, method or process on ground water or public health.

B. Reporting. The division shall distribute copies of the annual review to the manufacturer and the Sewage Handling and Disposal Advisory Committee.

C. Tracking of site locations. The manufacturer and the department shall keep records on the numbers, locations and operation of all provisionally approved systems.

D. Revisions to provisional approval. During the period of provisional approval, the department may revise any aspect of the site, soil and design requirements for that system based on experience gained during the use of the systems. The department shall work with the applicant to revise the approval by agreement, but shall not be prohibited from doing so without the consent of the applicant if warranted by health or environmental concerns. The revised provisional approval shall apply to any systems for which an application is filed after the revision

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is made.

**12 VAC 5-610-447. General approval of provisionally approved systems.**

A. After the evaluation period specified in 12 VAC 5-610-446 is completed, design and construction criteria shall be developed in Part IV (12 VAC 5-610-660 et seq.) if the commissioner is satisfied that the sewage treatment and disposal system, method, process or equipment has demonstrated operational competency equal to or better than that of a gravity flow septic tank drainfield absorption system. These criteria shall be incorporated into the regulations in accordance with the Virginia Administrative Process Act (§ 9-6.14:1 et seq. of the Code of Virginia). The criteria shall include as a minimum the site conditions necessary for permitting a system, design considerations, installation criteria, performance, monitoring and service requirements of the methods, processes and equipment.

B. After the evaluation period specified in 12 VAC 5-610-446 is completed, design and construction criteria shall not be developed in Part IV (12 VAC 5-610-660 et seq.) if the commissioner concludes that the sewage treatment and disposal system, method, process or equipment has not demonstrated operational competency equal to or better than that of a gravity flow septic tank-drainfield absorption system. The conditional system approval may be extended or rescinded for any system failing to show equivalency with a gravity flow septic tank-drainfield absorption system. After a provisional approval for a system has been rescinded, any future installations of systems utilizing the same design shall comply with all provisions of these regulations for experimental systems.

Article 3.

Mass Sewage Disposal Systems.

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**12 VAC 5-610-448. Special requirements for mass sewage disposal systems.**

The criteria contained in this article apply to mass sewage disposal systems and shall supersede any other conflicting criteria contained elsewhere in this chapter.

1. Ownership. Mass sewage disposal systems shall have a single owner as described in 12 VAC 5-610-250.

2. Low pressure distribution. All mass sewage disposal systems shall be designed using low pressure distribution.

3. Plans and specifications. All mass sewage disposal systems shall be considered Type II systems requiring formal plans and specifications.

4. Reserve areas. A separate reserve area or reserve areas meeting the requirements of the original absorption area or areas, and equaling 100% of the required area, shall be provided adjacent to the proposed system.

5. Recordation. In addition to the subsurface absorption system protection provided for in 12 VAC 5-610-700 a dedication document duly recorded with the clerk of the circuit court shall be furnished to the department stating that the sewage disposal areas and reserve areas will be used only for sewage renovation and may not be excavated or used for permanent structures while the mass sewage disposal system is utilized.

**12 VAC 5-610-449. Ground water modeling and verification.**

A. Nitrate evaluation. The prevention of ground water contamination shall be addressed by the applicant. Documentation shall include, but not be limited to, demonstrating that nitrogen concentrations in the ground water will be limited to 10 mg/l or less at the perimeter of the

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property.

1. Dilution areas. Dilution areas, if utilized, shall be adjacent to the mass sewage disposal system and shall be in line with the direction of local ground water flow when known. If the direction of local ground water flow is not known and cannot be readily determined, the regional ground water direction may be used.

2. Mass balance. Nitrogen calculations shall be based on a mass balance principle.

a. Unless demonstrated otherwise, the wastewater shall be assumed to have 70 mg/l of nitrogen concentration of which not more than 30% will be denitrified as a result of gaseous losses prior to entering a saturated zone.

b. No reduction in nitrate-nitrogen loading rate shall be given for reduced water flow. For the purposes of determining nitrate-nitrogen loads from residential wastewater, a flow of 75 gallons per person per day shall be utilized. Nothing contained in this subsection prevents the use of water saving fixtures. Furthermore, reduced absorption areas may be permitted pursuant to 12 VAC 5-610-680.

3. All drinking water wells shall be prohibited from being located anywhere within the plume of the mass sewage disposal system, where the nitrate concentration of the plume will exceed 10 mg/l.

4. When the nitrate level leaving the property exceeds 10 mg/l, the department shall require the system owner to cease discharging within six months unless a plan to take remedial action has been proposed, reviewed and approved by the department and installed, inspected and approved for use by the department.

B. Water mounding evaluation. The potential for effluent mounding below the absorption

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area shall be addressed by the applicant. The evaluation shall consider the impact of mass sewage disposal system facilities, proposed or existing, within 1,500 feet of the proposed mass sewage disposal system. Data shall be submitted which will demonstrate how a minimum of 24 inches of unsaturated soil will be maintained below the trench bottom. All water mounding calculations shall use measured hydraulic conductivity readings; estimating hydraulic conductivity without measured data shall be prohibited.

C. Location. In general, not less than four monitoring wells will be required. The monitoring wells shall be located to intercept any potential plume from the mass sewage disposal system and establish that adequate dilution is occurring. The department may require specific well locations to be designated by a certified professional geologist. Whenever a water supply is located within 500 feet down gradient from any part of a mass sewage disposal system or systems, at least one additional monitoring well shall be required between the water supply and the mass sewage disposal system.

D. Sampling. Ground water, soil and effluent sampling shall be required based on local hydrogeologic conditions. Sampling parameters shall be established by the department on a case-by-case basis but shall at a minimum include fecal coliform, chlorides and nitrates. Sampling frequency shall be every six months.

1. Responsibility for sampling. The owner of the mass sewage disposal system shall be responsible for ensuring that all samples are collected, analyzed, and reported to the department in accordance with these regulations. All laboratory tests shall be conducted in accordance with either Standard Methods for the Examination of Water and Wastewater, 1992 (American Public Health Association), or Methods for Determination of Inorganic Substances in Environmental Samples, August 1993 (USEPA).

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2. Reporting requirements. All sample results shall be submitted on or before the last work day of the month in which the sample is due. Sample results shall be submitted to the district health department office by the owner or the owner's representative. Results may be submitted on any form agreed to by the department prior to sampling.

E. Background sampling. At least one background sample from each well shall be required prior to permitting the mass sewage disposal system. Sampling may occur at any time satisfactory to the applicant. Where the background nitrate level is less than 10 mg/l, the system shall be designed to ensure that the nitrate level does not increase above 10 mg/l. Where the background nitrate level of any sample exceeds 10 mg/l, at the property boundary, the application for a mass sewage disposal system shall be denied.

**12 VAC 5-610-470. Physical features.**

A. Marshes and swamps. Placement of subsurface soil absorption systems on or in swamps and marshes is prohibited.

B. Slope. Subsurface soil absorption systems shall not be placed on slopes greater than 50% unless terraced.

C. Drainage ways.

1. Definition. A drainage way is a concave portion of the landscape in which surface water or rain water run-off gathers intermittently to flow to a lower elevation.

2. Placement. Subsurface soil absorption systems shall not be placed at a position in a drainage way subject to intermittent flooding.

D. Fill material. Fill material means soil transported and deposited by man as well as soil

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recently transported and deposited by natural erosion forces. Recent natural soil transportation and deposit is evidenced by one or more of the following.

1. No or indistinct soil horizons;
2. Depositional stratification;
3. Presence of a buried organic layer; and
4. Position in the landscape.

Placement of subsurface soil absorption systems in fill material is normally prohibited. However, fill material consisting of colluvial soil derived from sandstone (noncarbonaceous) in the mountainous area, may be considered on a case-by-case basis for placement of subsurface soil absorption systems.

~~E. Rock and impervious strata.~~

- ~~1. Separation distances to rock and impervious strata are contained in Table 4.4. The rock requirements pertain to continuous solid rock formations and outcroppings associated with the parent material and should not be confused with "stoniness".~~
- ~~2. Rock is defined as any material that is continuous and cannot be penetrated with a hand auger or hand posthole digger.~~
- ~~3. Impervious strata is defined as soil or soil materials with an estimated or measured percolation rate in excess of 120 minutes/inch.~~

E. Soil material required beneath a drainfield for treatment.

1. Eighteen or 24 inches of soil (see Table 2.1 in 12 VAC 5-610-250) meeting all the requirements contained in these regulations for the installation of a subsurface absorption

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trench, must exist below and beside all soil absorption trenches for the purpose of renovating sewage effluent before entering rock or other material not capable of treating effluent.

2. Where 18 inches or 24 inches of soil (see Table 2.1 in 12 VAC 5-610-250) meeting all the requirements contained in these regulations cannot be provided below a drainfield trench prior to encountering rock or water table, the separation distance may be reduced by six inches provided adequate pretreatment is provided. The minimum adequate pretreatment shall be considered to be sand filtration or other pretreatment capable of producing effluent containing not more than 30 mg/l BOD and 30 mg/l suspended solids at least 95% of the time on a continuous basis as measured by grab samples. Additional pretreatment may be required to address site specific concerns such as nitrate or bacterial contamination.

3. When pretreatment is utilized with a subsurface sewage disposal system, the permit shall be issued with conditions, as described in 12 VAC 5-610-250 J, and shall require monitoring and maintenance as described in Article 4 (12 VAC 5-640-490 et seq.) of Part III of the Alternative Discharging Sewage Treatment Regulations for Individual Single Family Dwellings including monitoring and maintenance contracts.

F. Sink holes. Placement of a subsurface soil absorption system at the low point of a sink hole is prohibited. For set back distance see 12 VAC 5-610-930, Table 4.4.

G. Flood plains. Subsurface soil absorption systems shall not be placed in flood plains subject to annual or more frequent sustained (24 hours) flooding.

H. Artificial drainage. Where soils are artificially drained, soil coloration may no longer be an

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accurate indicator of the position of the seasonal water table.

Three types of artificial drainage systems which are generally considered are as follow:

1. A water table depressor system of buried conduits i.e., agricultural drainage tile;
2. A lateral groundwater movement interceptor is a buried conduit for the purpose of intercepting lateral groundwater movement i.e., a French drain; and
3. Open ditches with the bottom elevation of the ditch below the seasonal water table.

I. Setback distances. Minimum setback distance between subsurface soil absorption systems and various structures and topographical features may be found in ~~Part IV of this chapter~~ 12 VAC 5-610-930, Table 4.4.

**12 VAC 5-610-700. Site preparation and alteration.**

A. Preservation of soil structure. The preservation of the original structure of the soil in the area selected for placement of the absorption trenches is essential to maintaining the percolative capacity of the soil.

1. Prohibition on construction. Subsurface soil absorption systems shall not be constructed in Texture Group III and IV soils during periods of wet weather when the soil is sufficiently wet at the depth of installation to exceed its plastic limit. For the purpose of this chapter the plastic limit of a soil shall be considered to have been exceeded when the soil can be rolled between the palms of the hands to produce threads 1/8 inch in diameter without breaking apart and crumbling.

Table 4.1  
Sewage Flows

Discharge Facility	Design Unit	Flow	BOD	S.S	Flow Duration
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		gpd	#/day	\$/day	(Hour)
Dwelling <sup>1</sup>	per person total	75	0.2	0.2	24
Food Preparation		15			
Toilet Facilities		20			
Bathing Facilities		20			
Hand Washing Facilities		5			
Laundering		15			
Schools with shower and cafeteria	per person	16	0.04	0.04	8
Schools without showers and with or without cafeteria	per person	10	0.025	0.025	8
Boarding Schools	per person	75	0.2	0.2	16
Motels at 65 gals/person (rooms only)	per person	130	0.26	0.26	24
Trailer Courts	per person	75	0.2	0.2	24
Restaurants	per seat	50	0.2	0.2	16
Interstate or through highway restaurants	per seat	100-180	0.7	0.7	16
Interstate Rest Areas	per person	5	0.01	0.01	24
Service Stations	per vehicle serviced	10	0.01	0.01	16
Factories & Office Buildings	per person per 8-hr shift	15-35	0.03-0.07	0.03-0.07	Operating Period
Shopping Centers	per 1000 ft. of ultimate floor space	200-300	0.1	0.1	12
Hospitals	per bed	300	0.6	0.6	24
Nursing Homes	per bed	200	0.3	0.3	24
Homes for the Aged	per bed	100	0.2	0.2	24
Doctors Office in Medical Center	per 100 ft.	500	0.1	0.1	12
Laundromats, 9 to 12# machines	per machine	500	0.3	0.03	16
Community Colleges	per student and faculty	15	0.03	0.03	12
Swimming Pools	per swimmer	10	0.001	0.001	12
<del>Theaters</del> Theaters,					
Drive-In Type	per car	5	0.01	0.01	4
Theaters, Auditorium Type	per seat	5	0.01	0.01	12
Picnic Areas	per person	5	0.01	0.01	12
Camps, Resort Day and Night with limited plumbing	per campsite	50	0.05	0.05	24
Luxury Camps with flush toilets	per camp site	100	0.1	0.1	24
Dump Station	per camp site	50	0.05	0.05	24

<sup>1</sup>For all dwelling units the design shall be based on two ~~person~~ persons per bedroom

2. Soil compaction. Special caution shall be taken in allowing wheeled and tracked vehicles to traverse the area selected for placement of the absorption systems before, during and after construction of the trenches, especially during wet weather. Precaution is especially important where Texture Group III and IV soils are involved. Alteration of soil structure by movement of vehicles may be grounds for rejection of the site and/or

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system.

3. Soil smearing. Excavating equipment utilized to construct the absorption system shall be so designed as not to compress or smear the sidewalks or bottom of the system. Excessive smearing of the usable absorption trench sidewalls or bottom during construction may result in irreversible damage to the soil infiltrative surface and may be grounds for rejection of the site and/or system.

B. Removal of vegetation. Vegetation such as maple, cottonwood, willows and other plant species with extremely hydrophilic (water loving) root systems shall be removed for a minimum of 10 feet from the actual absorption areas. Other trees should be removed from the absorption area.

C. Grading.

1. Pregrading. The proposed site for the subsurface soil absorption system shall not be graded until the district or local health department has completed the site evaluation contained in Part III, Article 1 of this chapter.

2. Interim grading. Interim grading means site grading during or immediately preceding the construction of the absorption system. Any such grading shall be done in accordance with the conditions contained in the construction permit. The district or local health department may require notification upon completion of the interim grading but before actual installation of the absorption system.

3. Final grading. Final grading of the absorption area site for diversion of surface water (e.g. crowning) for the purpose of eliminating surface water from flowing or ponding on the site, preparation for seeding, etc. shall be accomplished to avoid damaging the

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absorption area. Prior to grading, the distribution box, pretreatment unit and absorption area shall be clearly staked.

D. Drainage.

1. Surface water. The area surrounding the absorption area shall be graded to divert surface water from the absorption area site. The absorption area site shall also be graded to eliminate the ponding of water.

2. Roof drains, basement sump discharges (nonsewage), floor drains, footing drains, etc. are prohibited from being connected to the sewage disposal system and shall be directed away from the absorption area site in a manner to preclude water flow into, through or over the site. Discharge of sewage into a basement sump collecting water from floor drains, storm water, etc. is prohibited.

3. Lateral groundwater movement interceptors (LGMI e.g. French drains) may be required to divert groundwater movement away from the absorption area site. The LGMI shall be placed perpendicular to the general slope of the land and generally parallel to the absorption trenches. A tight drain from the LGMI shall be constructed to discharge into a natural or manmade drainage way.

E. Protection of subsurface soil absorption system.

1. No structures shall be placed over the subsurface soil absorption system. Driveways or parking lots shall not be constructed on the subsurface soil absorption system unless the invert of the lead or header lines or top of the gravel in the absorption trenches is deeper than 30 inches below the ground surface and the driveway or parking lot is paved with portland cement or bituminous concrete to prevent compaction of the trench bottom.

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Driveways and parking lots shall not be constructed over the distribution box unless adequate structural and access provisions are provided.

2. Where all or part of a subsurface soil absorption system is proposed to be installed on property other than the owners, an easement in perpetuity shall be recorded with the clerk of the court prior to issuance of a construction permit (see 12 VAC 5-610-280). The easement shall be of sufficient area to permit access, construction, required reserve area (see 12 VAC 5-610-710), and maintenance of the system.

3. Where the sewer line from the building to the pretreatment unit or the conveyance line is to be placed underneath a state road or in a Virginia Department of Transportation right-of-way, the requirement for a recorded easement in perpetuity can be waived for that portion of the system located underneath the road or in the right-of-way. In its place, the applicant shall obtain the appropriate permit or permits from the Department of Transportation to construct the sewer or conveyance line in its right-of-way. The construction permit for the sewage disposal system shall not be issued until the applicant provides the local health department with a copy of the permit issued by the Department of Transportation. Under no circumstances shall the pretreatment unit, the distribution box, or the soil absorption portion of the system be installed in the Department of Transportation right-of-way.

F. Preplacement and post-placement of utilities. Subsurface soil absorption systems shall not be placed in an underground utility easement. No buried utility service, e.g. water lines, electrical lines, gas lines etc., shall traverse the subsurface soil absorption system area nor shall the buried service be closer than 10 feet to the system.

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**12 VAC 5-610-810. Anaerobic biological systems.**

Septic tanks are the most commonly used pretreatment systems and under normal circumstances are the most inexpensive units which give acceptable results with a minimum of maintenance.

A. 1. Location. Minimum separation distances for septic tanks to various structures and features are the same as those contained in 12 VAC 5-610-930, Table 4.4, entitled Minimum Separation Distances; except that for Class III wells the distance shall be 50 feet.

B. 2. Materials. The preferred material for use in constructing septic tanks is concrete. Other materials may be considered on a case-by-case basis. All materials must be resistant to corrosion, both chemical and electrolytic and must have sufficient structural strength to contain sewage and resist lateral compressive and bearing loads.

C. Design. **12 VAC 5-610-815. Septic tank design.**

4. A. Tank capacity. The minimum hydraulic detention time shall be 48 hours based on daily design flow. In no case shall the septic tank capacity be less than 750 gallons. Table 4.2 contains the minimum required septic tank capacities for dwelling units.

Table 4.2

Septic Tank Capacities for Dwelling Units

No. Bedrooms	Approximate Tank Volume in Gallons
1	750
2	750

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3	900
4	1200
5	1500

2. B. Tank dimensions. Septic tanks shall be rectangular in plan, cross-section and longitudinal view. The length to liquid depth to width ratio should be approximately equal or greater than 2 to 1 to 1 (2:1:1) and less than or equal to 3 to 1 to 1 (3:1:1). In no case shall the liquid depth be less than four feet or greater than eight feet. A minimum of one foot free board shall be provided. Inlet and outlet structures shall be placed on the longitudinal axis of the tank. Typical tank dimensions are found in Table 4.3.

Table 4.3

Typical Septic Tank Dimensions in Feet

Approximate

Gallons	Length	Width	Liquid Depth	Freeboard
750	7	3.5	4	1
900	8	4	4	1
1200	9	4.5	4	1
1500	9.5	5	4.7	1

3. C. Inlet-outlet structure.

a. 1. General. The inlet and outlet structures shall function as a baffle. The invert of the inlet structure shall be greater than one inch but less than two inches higher than the invert of the outlet structure with the tank installed. The inlet structure shall extend six to eight inches below and eight to 10 inches above the normal liquid level. The outlet

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structure shall extend below the normal liquid surface to a distance of 35 to 40% of the liquid depth and eight to 10 inches above the normal liquid level. The inlet and outlet structures shall have an open space not less than four inches by four inches in cross-section or four inches in diameter.

b. 2. Materials. All materials used for inlet and outlet structures shall have long term resistance to chemical and electrolytic corrosion. When pipe tees are used as inlet and outlet structures, the material shall be compatible with the material used in the sewer.

4. D. Top access and watertightness. All septic tanks shall be watertight and shall be provided with a watertight top. As a minimum, access manholes shall be provided over the inlet and outlet structures and shall have a minimum open space of 18 inches by 18 inches. When the septic tank has in excess of 30 inches of soil cover an access manhole shall be brought to within 18 inches of the ground surface and shall be provided with a tight fitting cover. In wet areas the manhole covers shall be watertight.

E. Inspection port. All septic systems installed or repaired after July 1, 1994, and utilizing a septic tank for pretreatment, shall be equipped with a 4-inch to 6-inch (or larger) inspection port. The inspection port shall terminate at or above grade and be designed to allow an inspection of sludge build up in the septic tank. The inspection port shall be constructed of schedule 40 PVC pipe, or equivalent, and shall be fitted with a water-tight threaded cap. The recommended location of the inspection port shall be in or near the manhole cover on the inlet side of the septic tank away from the inlet tee. Other locations may be approved by the district health department on a case-by-case basis.

D. F. Construction of septic tanks. The contractor and/or manufacturer shall design and

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construct the septic tank to withstand the lateral and bearing loads to which the septic tank is expected to be subjected. Suggested design and construction criteria are contained in Appendix N.

~~E.~~ G. Placement of septic tanks. The precast septic tank shall be bedded with at least six inches of sand or fine gravel where rock or other undesirable conditions are encountered. The tank shall be placed level. Where excavation is required the hold shall be sufficiently large to permit placement of the tank. Backfilling the excavation for all septic tanks shall be done in layers with sufficient tamping to avoid settling. Backfill material shall be free of large stones and debris.

**12 VAC 5-610-820. Miscellaneous.**

A. Multiple septic tanks in series. The required volume for a septic tank may be satisfied by the utilization of two septic tanks in series, however, the first septic tank in series shall equal to 1/2 to 2/3 the required total volume.

~~12 VAC 5-610-830.~~ B. Physical and/or chemical systems. Physical ~~and/or~~ or chemical systems, or both, utilized as pretreatment for subsurface disposal of sewage shall meet the applicable criteria contained in 12 VAC 5-580-930 through 12 VAC 5-580-960 of the Sewerage Regulations.

~~12 VAC 5-610-840.~~ C. Water stop. A water stop is a method for sealing the annular space around a conduit ~~and/or~~ or pipe, or both, for the purpose of preventing infiltration ~~and/or~~ or exfiltration, or both. Conduits ~~and/or~~ pipes passing through the walls of a pretreatment unit shall be provided with a water stop.

**12 VAC 5-610-950. Absorption areas.**

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The absorption area is the undisturbed soil medium beginning at the soil gravel or sand interface which is utilized for absorption of the effluent. The absorption area includes the infiltrative surface in the absorption trench and the soil between and around the trenches.

A. Minimum soil conditions necessary for placement of absorption trenches.

1. Suitability of soil horizon. The absorption trench bottom shall be placed in the soil horizon or horizons with the "fastest" average estimated or measured percolation rate. Soil horizons are to be identified in accordance with 12 VAC 5-610-480. The soil horizon must meet the following minimum conditions:

a. It shall have an estimated or measured percolation rate equal to or less than 120 minutes per inch.

b. The soil horizon or horizons shall be of sufficient thickness so that at least 12 inches of absorption trench sidewall is exposed to act as an infiltrative surface; and

c. If no single horizon meets the conditions in ~~paragraph A~~ subdivision 1 b above of this subsection, a combination of adjacent horizons may be utilized to provide the required 12 inch sidewall infiltrative surface. However, no horizon utilized shall have an estimated or measured percolation rate greater than 120 minutes/inch.

2. Distance to rock, rock outcroppings, impervious strata and pans. The minimum acceptable separation distance, both vertical and horizontal, from the absorption trench bottom and sidewalls to rock, rock outcroppings, impervious strata and pans is one foot. (See Table 4.4 "Minimum Separation Distances")

3. Minimum depth to seasonal water table. As used herein the term seasonal water table means that portion of the soil profile where a color change has occurred in the soil as a

result of saturated soil conditions or where soil concretions have formed. Typical colors are gray mottlings, solid gray or black. The depth in the soil at which these conditions first occur is termed "seasonal water table". The minimum separation distance from the absorption trench bottom to the seasonal water table for various soil percolation rates is tabulated in Table 4.5.

Table 4.5

~~Minimum Separation Distances to Seasonal Water Table~~

~~Percolation Rate Distance from Trench Bottom~~

<del>Minutes/Inch</del>	<del>Inches</del>
<del>5</del>	<del>2</del>
<del>17</del>	<del>3</del>
<del>46</del>	<del>12</del>
<del>90</del>	<del>18</del>
<del>120</del>	<del>20</del>

Table 4.5

Minimum Separation Distances to Water Table.

<u>Texture Group</u>	<u>Percolation Rate (minutes per inch)</u>	<u>Separation Distance (inches)</u>	
		<u>without pretreatment</u>	<u>with pre- treatment<sup>1</sup></u>
<u>Group I</u>	<u>1 to 16</u>	<u>24</u>	<u>18</u>
<u>Group II</u>	<u>17 to 45</u>	<u>18</u>	<u>12</u>
<u>Group III</u>	<u>46 to 90</u>	<u>18</u>	<u>12</u>
<u>Group IV</u>	<u>90 to 120</u>	<u>18</u>	<u>12</u>

<sup>1</sup>Pretreatment in this context refers to sewage that has been treated to reduce both BOD and suspended solids to 30 mg/l or less.

4. Placement of absorption trenches below soil restrictions. Placement of the soil absorption trench bottom below soil restrictions as defined in 12 VAC 5610-490 E,

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whether or not there is evidence of a perched water table as indicated by free standing water or gray mottlings or coloration, requires a special design based on the following criteria:

- a. The soil horizon into which the absorption trench bottom is placed shall be a Texture Group I, II or III soil, or have an estimated or measured percolation rate of less than 91 minutes per inch.
- b. The soil horizon shall be a minimum of three feet thick and shall exhibit no characteristics that indicate wetness or restriction of water movement. The absorption trench bottom shall be placed so that at least two feet of the soil horizon separates the trench bottom from the water table and/or rock. At least one foot of the absorption trench side wall shall penetrate the soil horizon;
- c. A lateral groundwater movement interceptor (LGMI) shall be placed upslope of the absorption area. The LGMI shall be placed perpendicular to the general slope of the land. The invert of the LGMI shall extend into, but not through, the restriction and shall extend for a distance of 10 feet on either side of the absorption area (See 12 VAC 5-610-700 D 3); and
- d. Pits shall be constructed to facilitate soil evaluations as necessary.

#### B. Sizing of absorption trench area

1. Required area. The total absorption trench bottom area required shall be based on the average estimated or measured percolation rate for the soil horizon or horizons into which the absorption trench is to be placed. If more than one soil horizon is utilized to meet the sidewall infiltrative surface required in ~~paragraph A 1 of this chapter~~ subdivision A 1 of

this section, the absorption trench bottom area shall be based on the average estimated or measured percolation rate of the "slowest" horizon. The trench bottom area required in square feet per 100 gallons (Ft<sup>2</sup>/100 Gals) of sewage applied for various soil percolation rates is tabulated in Table 4.6. The area requirements are based on the equation:

$$\log y = 2.00 + 0.008 (x)$$

where  $y = \text{Ft}^2/100 \text{ Gals}$

$x = \text{Percolation rate in minutes/inch}$

Notwithstanding the above, the minimum absorption area for single family residential dwellings shall be 400 square feet.

2. Area reduction. See Table 4.6 for percent area reduction when low pressure distribution is utilized. A reduction in area shall not be permitted when flow diversion is utilized with low pressure distribution.

Table 4.6  
Area Requirements for Absorption Trenches

Percolation Rate Minutes/Inch	Area Required Ft <sup>2</sup> /100 Gals		Area Required Ft <sup>2</sup> /Bedroom	
	Gravity	Low Pressure Distribution	Gravity	Low Pressure Distribution
5	110	110	165	165
10	120	120	180	180
15	132	132	198	198
20	146	146	218	218
25	158	158	237	237
30	174	164	260	255
35	191	170	286	260
40	209	176	314	264
45	229	185	344	279
50	251	193	376	293
55	275	206	412	309
60	302	217	452	325

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65	331	228	496	342
70	363	240	544	359
75	398	251	596	375
80	437	262	656	394
85	479	273	718	409
90	525	284	786	424
95	575	288	862	431
100	631	316	946	473
105	692	346	1038	519
110	759	379	1138	569
115	832	416	1248	624
120	912	456	1368	684

C. Minimum cross section dimensions for absorption trenches.

1. Depth. The minimum trench sidewall depth as measured from the surface of the mineral soil shall be ~~18~~ six inches when placed in a landscape with a slope less than 10%. ~~Mineral soil is a soil consisting predominantly of, and having its properties determined predominantly by mineral matter. A mineral soil usually contains less than 20% organic matter, but it may contain an organic surface layer up to 12 inches thick.~~ The installation depth shall be measured on the downhill side of the absorption trench. When the installation depth is less than 18 inches, the depth shall be measured from the lowest elevation in the microtopography. All systems shall be provided with at least 12 inches of cover to prevent frost penetration and provide physical protection to the absorption trench; however, this requirement for additional cover shall not apply to systems installed on slopes of 30% or greater. Where additional soil cover must be provided to meet this minimum, it must be added prior to construction of the absorption field, and it must be crowned to provide positive drainage away from the absorption field. The minimum trench depth shall be increased by at least five inches for every 10% increase in slope. Sidewall depth is measured from the ground surface on the downhill side of the trench.

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2. Width. All absorption trenches utilized with gravity distribution shall have a width of from 18 inches to 36 inches. All absorption trenches utilized with low pressure distribution shall have a width of eight inches to 24 inches.

D. Lateral separation of absorption trenches. The absorption trenches shall be separated by a center to center distance no less than three times the width of the trench for slopes up to 10%. However, where trench bottoms are two feet or more above rock, pans and impervious strata, the absorption trenches shall be separated by a center to center distance no less than three times the width of the trench for slopes up to 20%. The minimum horizontal separation distance shall be increased by one foot for every 10% increase in slope. In no case shall the center to center distance be less than 30 inches.

E. Slope of absorption trench bottoms.

1. Gravity distribution. The bottom of each absorption trench shall have a uniform slope not less than two inches or more than four inches per 100 feet.

2. Low pressure distribution. The bottom of each absorption trench shall be uniformly level to prevent ponding of effluent.

F. Placement of absorption trenches in the landscape.

1. The absorption trenches shall be placed on contour.

2. When the ground surface in the area over the absorption trenches is at a higher elevation than any plumbing fixture or fixtures, sewage from the plumbing fixture or fixtures shall be pumped.

G. Controlled blasting. When rock or rock outcroppings are encountered during construction

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of absorption trenches the rock may be removed by blasting in a sequential manner from the top to remove the rock. Percolation piping and sewer lines shall be placed so that at least one foot of compacted clay soil lies beneath and on each side of the pipe where the pipe passes through the area blasted. The area blasted shall not be considered as part of the required absorption area.

**12 VAC 5-610-1080. Anaerobic lagooning of septage.**

A. General. An anaerobic lagoon for the purpose of this chapter is a nondischarging facility consisting of an open impervious structure, constructed of earth or other material specifically designed for receiving and stabilizing septage and other sewage sludges. Industrial waste sludges and sludges containing toxic material shall not be placed in these lagoons.

B. General site requirements.

1. Engineering, geologic, soil and hydrologic evaluation. Geologic information required by the district or local health department and the ~~bureau~~ division shall include, but not be limited to, soil characteristics, percolation information, maximum groundwater table, direction of groundwater movement and permeability.

2. Location.

a. Minimum setback distances for topographic features are the same as those for subsurface soil absorption systems and are contained in Table 4.4.

b. Buffer zone. Buffer zone criteria are contained in Appendix I.

c. Flood protection. The anaerobic lagoon and operational components shall be located at an elevation which is not subject to the 100-year flood/wave action or shall

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otherwise be adequately protected against the 100-year flood/wave action damage. The anaerobic lagoon shall remain fully operational during the 25-year flood/wave action.

d. Surface runoff. Adequate provisions shall be made to divert storm water around the anaerobic lagoon and otherwise protect the lagoon's embankments.

3. Access. An all weather access road shall be provided.

4. Fencing. The facility site to include treatment units and appurtenances shall be fenced with a five foot fence (woven wire plus barbed wire); gates and locks to provide controlled entry into the facility. The fence shall be posted with signs identifying the facility, safety and health dangers and trespass penalties. The fence shall not be constructed closer than 10 feet to the outside edge of any treatment unit or appurtenance.

C. Design requirements (See Figure IV-1 for typical sections).

1. Receiving facilities.

a. An impervious pad or sufficient strength to support a loaded tank truck and with drainage to the lagoon shall be provided at the point or points where the contents of the tank truck is offloaded into the lagoon or receiving facilities.

b. The receiving and inlet facilities shall be designed to transport the septage into the lagoon, to distribute the septage as evenly as possible throughout the lagoon and to minimize generation of odors and suspension of solids.

2. Treatment units.

a. Anaerobic lagoons.

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(1) Number and capacity. A minimum of two lagoons shall be provided. The combined total capacity of the lagoons shall provide eight months storage based on the average daily discharge into the lagoon.

(2) Operating depth. The normal operating depth shall be from three to five feet.

(3) Lagoon bottom. The lagoon bottom shall be level, constructed of impervious material ( $10^{-6}$  cm/sec) and be a minimum of two feet above the seasonal water table or at the original ground surface.

For Typical Anaerobic Lagoon Inlet Structure, see Virginia Administrative Code print product.

(4) Lagoon embankments. Embankments and/or dike walls shall be impervious and structurally stable. They shall be designed to permit access of equipment by appropriate lining or internal barriers necessary for sludge removal in a nuisance free and safe manner, and to minimize risk, supervision, operation and maintenance. Earthen embankments shall be sloped (minimum 1:3) and seeded with proper cover, subject to soil characteristics, to minimize erosion.

(5) Freeboard. A minimum freeboard of two feet above the normal depth shall be provided.

(6) Shape. A uniform shape shall be provided i.e. round, square, or rectangular with no narrow or elongated portions. The lagoon shall not contain islands, peninsulas or coves unless they are part of the inlet/outlet design.

b. Sludge dewatering. When sludge dewatering units are provided they shall be designed in accordance with 12 VAC 5-580-700, Sludge Dewatering, Virginia

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Sewerage Regulations contained in Appendix J.

3. Supernatant disposal. Normally the lagoon supernatant should be included in the sludge mixed liquor which is disposed of on the land. When a system is designed to provide for separate supplemental supernatant disposal it shall be by subsurface soil absorption system. The minimum subsurface soil absorption system field size shall be based on the anticipated average daily supernatant generation rate and shall meet all applicable criteria contained in ~~Part III~~, Article 1 (12 VAC 5-610-560 et seq.) of Part III and ~~Part IV~~, Article 5 (12 VAC 5-610-900) of Part IV of this ~~chapter~~ chapter. The lagoon outlet shall be designed to minimize the solids content of the supernatant withdrawn for disposal in the subsurface soil absorption system and shall be provided with a means to control the rate and quantity of supernatant withdrawal.

**12 VAC 5-610-1140. General.**

Authority for this article is found in § 32.1-164 B 6 of the Code of Virginia. This article pertains only to new construction where a nonpublic water supply, other than a private well, is to be constructed and utilized in conjunction with an onsite sewage disposal system. Approval of the water supply is an integral part of the issuance of an operation permit for a sewage disposal system (see 12 VAC 5-610-340) and no separate permit is required. An approval of a water supply under this section connotes a water supply meeting the quantity, quality and construction standards of a satisfactory water supply at the time of approval.

A. Quantity.

1. The system shall be capable of supplying water in adequate quantity for its intended usage. Failure to provide adequate capacity may cause intermittent flows and negative

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pressures which may cause contamination of the system through cross connections or other system deficiencies.

2. The source shall have a capacity to produce 150 gallons per bedroom per day for residential use.

3. The minimum system capacity (source plus storage) should be capable of delivering a sustained flow of five gallons per minute per connection for 10 minutes for ordinary residential use.

~~4. When wells are utilized the yield and drawdown of the well shall be determined by one of the following methodologies:~~

~~a. All wells, air lift, bail or pump for a minimum of 30 minutes.~~

~~b. Bored wells only: Bail down water level and measure recovery over a 30 minute period; if flow into well is slow, bail the well and measure recovery after 24 hours.~~

~~A completed GW-2 Form shall be used to certify the yield of the well.~~

#### B. Quality.

1. Water sources described in this section shall be considered satisfactory if the water sample or samples test negative for coliform organisms. Sources with positive coliform counts, but with less than 100 MPN/100ml shall be provided with a means for continuous disinfection (chlorination).

2. A sample tap shall be provided at or near the water entry point into the system so that samples may be taken directly from the source; this requirement may be met by utilizing the first tap on the line near where the plumbing enters the house (may be a hose bib),

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provided the tap precedes any water treatment devices.

3. The entire water system including the well shall be disinfected prior to use. After operating the well to remove any remaining disinfectant, a sample of the water from the well shall be collected by the district or local health department for bacteriological examination. The sample may be collected by the owner ~~or well driller~~, or an agent designated by the owner, provided the sample is submitted to a private, certified (by Division of Consolidated Laboratory Services) laboratory for analysis.

4. If tests indicate that the water is unsatisfactory and no other approval source is available, adequate approved methods of water treatment shall be applied. The district or local health department shall be consulted when treatment is necessary.

C. Approval. All water supplies covered by this chapter shall be approved by the district or local health department before being placed into service as a satisfactory water supply.

## **12 VAC 5-610-1150. Wells. (Repealed.)**

### **A. General.**

~~1. Drinking water wells covered under this chapter. All nonpublic water supply wells used, or intended to be used, for a drinking water supply to residential, commercial or industrial buildings or facilities that are constructed in conjunction with the construction of an onsite sewage disposal system are covered by this chapter.~~

~~2. Nonpublic drinking water wells not covered under this chapter. This chapter does not apply to nonpublic drinking water wells already in existence on the effective date of this chapter.~~

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~~3. Classes of water wells. The following classes of drinking water wells are established for purposes of this chapter. These clauses are in addition to those established in the current Commonwealth of Virginia Waterworks Regulations and are intended for use for nonpublic drinking water systems:~~

~~a. Class III A (drilled wells).~~

~~b. Class III B (bored wells).~~

~~c. Class III C (jetted wells).~~

~~d. Class III D (dug wells).~~

~~B. Well location.~~

~~1. Sanitary survey. Any obvious source of toxic or dangerous substances in the vicinity of the proposed water well shall be investigated by the district or local health department. If the source of contamination would affect the well adversely, the well shall be prohibited. The minimum separation distance between the well and sources of pollution shall be the same as that for the subsurface soil absorption system. See Table 4.4 Minimum Separation Distances and 12 VAC 5-610-810 A.~~

~~2. Downslope siting of wells from potential sources of pollution. Special precaution shall be taken when locating a well within a 60 degree arc directly downslope from any part of any existing or intended onsite disposal system or other known source of pollution, including, but not limited to, buildings subject to termite or vermin treatment or used to store polluting substances or storage tanks or storage areas for petroleum products or other deleterious substances. The minimum separation distance shall be increased by 25 feet for every five percent of slope and/or an increase be made to the minimum depth of~~

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grout and casing in the amount of five feet for every five percent of slope.

~~3. Sites in swampy areas, low areas, or areas subject to flooding. No water well covered by this chapter shall be located in areas subject to annual flooding or in other areas subject to the collection of pollutants.~~

~~C. Site protection.~~

~~1. No objects, articles, or materials of any kind which are not essential to the operation of the well should be placed or stored in a well house, on the well head or well pump or water treatment system, or within close proximity to them.~~

~~2. The application of agricultural fertilizers, pesticides, and/or herbicides within close proximity to the well or treatment system should be prohibited.~~

~~3. The minimum distance from any well subject to this chapter to any property line shall be 10 feet.~~

~~4. Fencing of the well lot may be required under certain conditions such as to prohibit livestock access to the well head.~~

~~5. If necessary, the area around the well shall be graded to divert surface water away from the well.~~

~~D. Materials.~~

~~1. General. All materials used in drinking water wells shall have long term resistance to corrosion and sufficient strength to withstand hydraulic, lateral and bearing loads.~~

~~2. Casing. Materials used for casing shall be watertight and shall consist of ductile iron, wrought iron, concrete tile, clay tile, steel, stainless steel or plastic, all designed for water~~

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~~well use or other suitable materials as determined by the district or local health department on a case-by-case basis. Driven casings shall consist of ductile iron, steel or stainless steel and shall be equipped with a suitable drive boot.~~

~~3. Screens. Where utilized, screens shall be construed of stainless steel, bronze, copper or plastic or other suitable materials as determined by the district or local health department on a case-by-case basis.~~

~~4. Joints. Joints shall be watertight, and mechanically sound. Welded joints shall have smooth interior surfaces and shall be welded in accordance with acceptable welding practice.~~

~~5. Gravel. Gravel utilized for gravel packed wells shall be uniformly graded, clean, washed and of a suitable size.~~

~~E. Construction; general.~~

~~1. Casing. All Class III wells shall be cased to a minimum depth of 20 feet or terminated one foot in bedrock when bedrock is encountered at a depth less than 20 feet. Casings shall be extended at least 12 inches above ground. When the casing is extended to the aquifer and the aquifer is overlain by consolidated materials, the casing shall extend at least one foot into the consolidated material, however, when in unconsolidated material, the casing shall terminate in the aquifer.~~

~~2. Screens. When used, for the prevention of entry of foreign materials, screens shall be free of rough edges, irregularities, or other defects. A positive watertight seal between the screen and the casing shall be provided.~~

~~3. Grouting.~~

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a. Purpose. ~~The annular space between the casing and well bore is one of the principal avenues through which undesirable water and contaminants may gain access to a well. Therefore, the annular space shall be filled with neat cement grout. Neat cement grout shall consist of cement and water with not more than six gallons of water per sack (94 pounds) of cement.~~

~~Exception: When exceptional conditions require the use of a less fluid grout, to bridge voids, a mixture of cement, sand and water in the proportion of not more than two parts by weight of sand to one part of cement with not more than six gallons of clean water per bag of cement may be used if approved by the district or local health department, or for bored wells only, a concrete (1-1-2 mix with all aggregates passing a 1/2 inch sieve) grout with not more than six gallons of clean water per bag of cement may be used provided a minimum three inch annular space is available and its use approved by the district or local health department.~~

~~In cases where an open borehole has been drilled below the depth to which the casing is to be grouted, the lower part of the hole must be backfilled, or a bridge must be set in the hole, to retain the slurry at the desired depth. Backfilling the hole with gravel and capping with sand is a common procedure. Material ordinarily sold as plaster or mortar sand is usually satisfactory; more than half the sand should be of grain sizes between 0.012 inches and 0.024 inches.~~

b. Depth. ~~All Class III wells shall be grouted to a minimum depth of 20 feet when the casing depth is equal or greater than 20 feet. When the casing depth is less than 20 feet in accordance with 12 VAC 5-610-1150 E above, the casing shall be grouted from the bedrock to the surface. Alternate grouting depths may be accepted for bored~~

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wells when the sole source aquifer lies between 10 and 20 feet provided the following conditions are met:

(1) The grouting shall terminate at least one foot above the aquifer but must not be less than 10 feet in depth from the ground surface.

(2) The slope between the wells and any source of contamination shall not exceed five percent, and if the soil absorption system meets the conditions of subdivision E 4 of this section. The well must also meet the requirements of the section. If the sole source is less than 10 feet in depth, the owner may apply for a variance.

The provisions of continuous treatment, i.e., disinfecting, along with information on surrounding soil conditions, and distances to sources of pollution would be necessary as a minimum to support the variance request.

c. Installation. All Class III wells shall be grouted. A neat cement bentonite grout is preferable over any other grout mixture. The grout shall be installed by means of a grout pump or tremie pipe from the bottom of the annular space upward in one operation until the annular space is filled, whenever the grouting depth exceeds 20 feet. Pouring of grout is acceptable for both drilled and bored wells whenever grouting depth does not exceed 20 feet. Grouting shall be brought to the ground surface and flared to provide a seal with the soil. When an outer casing is utilized during the construction of the well, the outer casing shall be pulled simultaneously with the grouting operation. The outer casing shall not be allowed to remain after the grouting operation.

d. Annular space. The clear annular space around the outside of the casing and the

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~~well bore must be at least 1 1/2 inches on all sides. (See exception for bored wells subdivision E 3 a of this section.)~~

~~4. Additional casing and grouting. When the subsurface soil absorption system is placed at a depth greater than five feet below the ground surface the casing and grouting of the water well shall be increased to maintain at least a 15 foot vertical separation between the trench bottom and the lower terminus of the casing and grouting.~~

~~5. Well head.~~

~~a. General. No open wells or well heads or unprotected openings into the interior of the well will be permitted.~~

~~b. Mechanical well seals. Mechanical well seals shall be used on all wells with metallic or plastic casing.~~

~~c. Other. Large diameter wells shall be provided with a watertight overlapping (shoebox) type cover, constructed of reinforced concrete or steel.~~

~~6. Appurtenances passing through casing.~~

~~a. General. All openings through well casings shall be provided with a positive water stop.~~

~~b. Pitless well adapters. Pitless well adapters shall be subject to approval by the bureau. All pitless adapters shall be installed according to the manufacturer's recommendations.~~

~~7. Venting. Venting shall be provided in such a manner as to allow for the passage of air but not water, insects, or foreign materials into the well.~~

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~~F. Disinfection. All wells shall be disinfected before placing the well or wells in service. Disinfection shall be accomplished with a 50 mg/l solution of chlorine for 24 hours.~~

~~G. Information to be reported. A copy of a Water Well Completion Report (State Water Control Board Form GW2) and the results of the yield and drawdown testing shall be provided to the district or local health department, the owner and the Water Control Board within 30 days of the completion of the well.~~

~~H. Well abandonment. Well abandonment shall be in conformance with the current guidelines of the State Water Control Board.~~

Appendix A. (Repealed.)

Appendix B. (Repealed.)

Appendix C. (Repealed.)

Appendix D. (Repealed.)

Appendix E. (Repealed.)

Appendix N. (Repealed.)

Appendix O. (Repealed.)

#### Documents Incorporated by Reference FORMS

Application for a Sewage Disposal System Construction Permit, C.H.S. 200 (Rev. 4/83).

Sewage Disposal System Construction Permit, C.H.S. 202A (Rev. 6/84).

Schematic Drawing of Sewage Disposal System and Topographic , C.H.S. 202B (Rev. 6/84).

Application for Sewage Handling Permit, B.W.E. 23-1.

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Application for Pump and Haul, B.W.E. 25-1.

Pump and Haul Storage Facility Construction Permit, B.W.E. 26-1.

Soil Evaluation Form, C.H.S. 201 (Rev. 4/83).

Soils Evaluation Percolation Test Data.

Record of Inspection-Non-Public Drinking Water Supply System.

Completion Statement, C.H.S. ~~203~~ 204 (Rev. 4/83).

#### DOCUMENTS INCORPORATED BY REFERENCE

Standard Methods for the Examination of Water and Wastewater, American Public Health Association, American Waterworks Association, Water Pollution Control Federation, 1992.

Methods for Determination of Inorganic Substances in Environmental Samples, United States Environmental Protection Agency, August 1993.

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