EXHIBIT L

DEPARTMENT OF HEALTH, ENVIRONMENTAL HEALTH

SUBJECT: Onsite Wastewater

DESCRIPTION: A summary follows of proposed changes to the Rules and Regulations Pertaining to Onsite Wastewater Systems:

5.8.2.1 ~~The installation shall not be covered without approval from the authorized agent.~~ Within five (5) days, the installer shall certify that the system has been installed pursuant to the approved permit.

This brings the regulation into compliance with Act 939 of 2007.

5.9.1 All subdivision plans which are proposed to utilize onsite wastewater systems as a method of wastewater treatment for all or part of the lots or tracts in said subdivision shall be submitted to the Arkansas Department of Health for review and approval of the overall plan for the utilization of onsite wastewater systems. Any lots or parcels within the boundaries of the proposed subdivision which are found to be unsuitable for subsurface onsite systems must be incorporated into surrounding lots or parcels. Areas designated as green or community space must be clearly identified and will not be assigned a lot number or considered in the approval of the subdivision. ~~The procedure for subdivision review and approval shall be as follows:~~

11.6.3.7.3 The inlet and outlet must be indicated. ~~Each septic tank shall have only one inlet and one outlet.~~ Tanks must utilize approved tank penetration seals.

11.6.5 Inlet and outlet. Four-inch or larger sanitary tees shall be used as inlet and outlet devices in all septic tanks. The septic tank manufacturer shall provide properly constructed inlet and outlet devices with each tank. The effluent line leaving the tank shall be Schedule 40 PVC. The inlet invert shall enter the tank at least 3 inches above the liquid level in the tank to allow for a momentary rise in liquid level during discharges to the tank. This free drop prevents blackwater and standing of solid material in the house sewer leading to the tank. The inlet tee shall extend at least 6 inches below the liquid level in the tank and extend above the liquid level to a minimum of one inch from the top of the tank. In no case shall the inlet device be greater in length than the outlet device.

Under "DR Responsibilities in Application Submittal":

2. The drawing to be to scale using either 1 inch = 20 feet or 1 inch = 30 feet. The drawing must indicate the house, all septic system components, and all other features affecting the location of primary and ~~alternate~~ secondary disposal locations.

7. The location and elevation of the water well and water supply line must be shown, along with their distance from all parts of proposed septic system location and alternate disposal location. For public water systems, show the distances from the septic system's components and ~~alternate~~ secondary disposal location to the water mains and the water service lines.

8. The location, elevation and distances of all wells and/or septic systems on adjoining properties that are within 100 feet of the proposed septic system and ~~alternate~~ secondary area must be shown.

10. In the primary and ~~alternate~~ (secondary) disposal site locations, contour lines or arrows indicating the direction and degree of the lot's slope must be shown.

11. A bench-mark must be designated and elevation shots or rod readings must be shown for all parts of the sewage system. Ground elevation and flow-line elevations must be provided for all system components. This includes the stub-out and the beginning, middle and end of each absorption trench in the primary and ~~alternate~~ (secondary) disposal sites. The ~~alternate~~ secondary area must be indicated and properly sized.

21. The soil determination, percolation test or soil pit in the ~~alternate~~ secondary area must be indicated.

These changes standardize word use throughout the regulation.

Under "Designated Representative Site Responsibilities":

2. The beginning, middle and end of all laterals shall be flagged in both the primary and ~~alternate~~ secondary site. **Exception**: The secondary site need not be flagged provided the lot is 1.5 acres or larger in size; the slope is less than 10 percent; or the secondary site is clearly acceptable. Technical change to be less restrictive than current regulation on secondary areas.

PUBLIC COMMENT: A public hearing was held on February 12, 2010, and the public comment period expired that date. No public comments were submitted to the agency. The proposed effective date is June 15, 2010.

CONTROVERSY: This is not expected to be controversial.

FINANCIAL IMPACT: There is no financial impact.

LEGAL AUTHORIZATION: Arkansas Code Annotated § 20-7-109(a)(1)(A) authorizes the State Board of Health to make all necessary and reasonable rules and regulations of a general nature for the protection of public health and safety. The Environmental Health Division (formerly Division of Sanitarian Services) of the Department of Health shall have general supervision and authority over the location, design, construction, installation and operation of individual sewage disposal systems, and shall be responsible for the administration of the Arkansas Sewage Disposal Systems Act and of the rules and regulations adopted pursuant to this chapter. Ark. Code Ann. § 14-236-107.

RULES AND REGULATIONS

PERTAINING TO

ONSITE WASTEWATER SYSTEMS

ACT 402 OF 1977

A.C.A. 14-236-101 et seq.

Revised:

~~December 22, 2008~~

Table of Contents

Section 1. Authority and Purpose

1.1. The following RULES AND REGULATIONS PERTAINING TO ONSITE WASTEWATER SYSTEMS are duly adopted and promulgated by the Arkansas State Board of Health pursuant to the authority expressly conferred by the laws of the State Arkansas including, without limitation, Act 96 of 1913 (A.C.A. 20-7-I09), and Act 402 of I977 (A.C.A. 14-236-101, et seq.).

1.2. Purpose: To establish minimum standards for the design and construction of onsite wastewater systems in suitable soils for the renovation of wastewater and the return of the renovated wastewater into the hydrologic cycle.

Section 2. Definitions

2.1. **Alternate Onsite Wastewater System.** A non-standard individual wastewater treatment or collection system approved by the Department in instances where a standard system is not suitable.

2.2. **Approved System.** An onsite wastewater system constructed and installed in accordance with the standards and requirements of this Regulation and for which a Permit for Operation has been issued. "Approved system" does not imply that the system will perform satisfactorily for a specific period of time, only that the system has met the minimum requirements of this Regulation.

2.3. **Authorized Agent.** The Environmental Health Specialist assigned to the County, or Business Unit by the Department.

2.4. **Bedrock.** Consolidated rocks such as sandstones, siltstones, and shale, which essentially retain their depositional or tectonic orientation. Fine earth materials shall constitute less than 10% of the materials and no other conditions exist that would provide adequate wastewater renovation. Where bedrock and soil horizons are interlayered, the depth to bedrock shall be the cumulative thickness of the soil layers greater than or equal to four inches in thickness within 72 inches of the soil surface.

2.5. **Bedroom**. Any room inside a residence intended for the purposes of sleeping quarters.

2.6. **Benchmark.** A mark made on a stationary object of a determined position and elevation and used as a reference point.

2.7. **Community Wastewater System.** Any system, whether public or privately owned, serving 2 or more individual lots, for the collection, treatment and disposal of wastewater or industrial wastes of a liquid nature, including various devices for the treatment of such wastewater or industrial wastes.

2.8. **Department.** The Arkansas Department of Health.

2.9. **Designated Representative (DR).** A person certified by the Department to make percolation tests, system designs and inspections subject to the authorized agent's final approval. Designated representatives shall be registered professional engineers, registered land surveyors, licensed master plumbers, registered sanitarians or other similarly qualified individuals holding current certificates from the State of Arkansas, and shall demonstrate to the satisfaction of the authorized agent prior to their designation as a "designated representative" their competency to make percolation tests, designs and final inspections for onsite wastewater systems in accordance with these Rules and Regulations and when authorized by the Authorized Agent.

2.10. **Dwelling Unit.** A structure intended to be used as a residence. A single structure may contain more than one dwelling unit: e.g., a duplex contains 2 dwelling units.

2.11. **Distribution Box.** A watertight box that receives the discharge of effluent from the septic tank and distributes the flow of wastewater equally to each absorption trench.

2.12. **Distribution Device.** A device, approved by the Department, used to distribute or alternate the effluent load between 2 or more locations.

2.13. **Domestic Wastewater.** All wastes discharging from sanitary conveniences and plumbing fixtures of a domestic nature, exclusive of industrial and commercial wastes.

2.14. **Dosing Tank.** A tank constructed of concrete, plastic, fiberglass or other approved material that contains one or more pumps or automatic siphons designed to deliver a specified volume of wastewater effluent to the distribution system.

2.15. **Emergency Repair.** The repair and/or replacement of any part of a malfunctioning onsite wastewater system, excluding the alteration of existing absorption trenches and/or the installation of additional absorption area, that poses an immediate health hazard.

2.16. **Engineering.** The engineering section of the Arkansas Department of Health.

2.17. **Experimental Onsite Wastewater System.** A sewage treatment system that is not classified as a standard or alternate onsite wastewater system. Experimental systems may be approved on a case-by-case basis and evaluated under the direction of the Department to determine the effectiveness of the system.

2.18. **Fragipan.** A natural subsurface horizon having a higher density than the soil above; cemented when dry but showing brittleness when moist. This layer is 15 cm or more in thickness and shows evidence of pedogenesis within the horizon or on the face of structural unit. The layer has very coarse prismatic, columnar, or blocky structure, has weak structure of any size or is massive. The layer has, in 60 percent or more of the volume, a firm or firmer rupture-resistance class, a brittle manner of failure at or near field capacity, virtually no roots and the layer is not effervescent in dilute HCL.

2.19. **High Strength Wastewater.** Wastewater which exceeds the following parameters; biochemical oxygen demand (BOD_5), of 300 mg/l; total suspended solids (TSS) of 300 mg/l; fats, oils and grease content of 25 mg/l.

2.20. **High-use Area.** Any site accessible to the public for the purposes of entertainment, recreation, or gathering.

2.21. **High Water Mark.** The established maximum flood elevation of lakes with constructed dams, or when not available, the line which the water impresses on the soil by covering it for sufficient periods of time to deprive it of non-aquatic vegetation.

2.22. **Homeowner.** A person who owns and occupies a building as his home.

2.23. **Hydraulic Conductivity.** The rate of water movement under unit gradient in a specific soil horizon.

2.24. **Onsite Wastewater System.** A single system of treatment tanks and/or renovation facilities used for the treatment of domestic wastewater, exclusive of industrial wastes, serving only a single building, commercial facility such as an office building, or industrial plant or institution.

2.25. **Industrial Wastes**. Liquid wastes resulting from the processes employed in industrial and commercial establishments.

2.26. **Installer.** Any person, firm, corporation, association, municipality, or governmental agency licensed by the department, which constructs, installs, alters or repairs onsite wastewater systems for others.

2.27. **Interceptor Drain.** A subsurface drainline, usually constructed upgrade from the absorption area to divert seasonal groundwater.

2.28. **Lake.** A considerable body of inland water or an expanded portion of a river generally of appreciable size and too deep to permit vegetation, excluding subaqueous vegetation, to take root completely across the expanse of water.

2.29. **Maintenance Personnel.** An individual certified by the Department to conduct assessments under the Onsite Maintenance and Monitoring Program.

2.30. **Municipality.** A city, town, county, district, or other public body created by or pursuant to State law, or any combination thereof, acting cooperatively or jointly.

2.31. **Pedon.** The smallest classifiable soil units. Pedons are intended to be of a size suitable for field examination, description, and sampling.

2.32. **Person.** Any institution, public or private corporation, individual, partnership, or other entity.

2.33. **Piezometer.** A pipe placed in the soil which gives the water pressure at depth. The reading is used to estimate the elevation of a water table.

2.34. **Pond.** A body of water smaller than a lake, often artificially formed.

2.35. **Potable Water.** Water free from impurities in amounts sufficient to cause disease or harmful physiological effects with the bacteriological and chemical quality conforming to applicable standards of the Arkansas State Board of Health.

2.36. **Primary Absorption Area.** The area approved by the Department or it's authorized agent for the installation of an onsite wastewater system for a specified tract of land.

2.37. **Professional Soil Classifier (P.S.C.).** A person who, by reason of their special knowledge of the physical, chemical, and biological sciences applicable to soils as natural bodies and of the methods and principles of soil classification experience in the formation, morphology, description, and mapping of soils, is qualified to practice soil classifying, and who has been registered by the Arkansas State Board of Registration for Professional Soil Classifiers.

2.38. **Property Owner.** A person who owns and may or may not occupy the property.

2.39. **Property Owners' Association.** An association created by and pursuant to State law and organized for the purpose of maintaining common facilities including onsite wastewater facilities in unincorporated subdivisions.

2.40. **Redoximorphic Features.** Soil features formed by the processes of reduction, oxidation, and translocation of iron and manganese oxides in seasonally saturated and reduced soils.

2.41. **Relic Redoximorphic Features.** Redoximorphic features that are observed in the soil profile but are not indicative of contemporary seasonal water table levels. Redoximorphic features may not be considered relic unless they meet the guidelines as specified in Section 8.4.1.1 or are evaluated by a monitoring process as specified in Section 8.4.6.

2.42. **Residential Strength Effluent.** Effluent which does not exceed the following parameters. biochemical oxygen demand (BOD_5), of 300 mg/l; total suspended solids (TSS), of 300 mg/l; fats, oils and grease content of 25 mg/l.

2.43. **Restrictive Soil Layer.** A soil layer that impedes the movement of water, air or growth of plant roots. Examples of such layers or conditions are traffic pans, claypans, fragipans, compacted soil, bedrock and clayey soil.

2.44. **Scum.** The accumulated floating material, including grease, oils and other low-density solids in a septic tank.

2.45. **Secondary Absorption Area.** An alternate location indicated on a lot or plot plan showing where the absorption area is to be placed in the event of failure or necessary replacement of the system located on the primary absorption area.

2.46. **Seasonal Water Table (SWT).** A zone of soil that become saturated for periods long enough to undergo reducing conditions during periods of climatic stress due to an underlying restrictive layer. The seasonal water table may be classified as brief, moderate, or long.

2.47. **Septic Tank.** A single tank or series of tanks that receives raw domestic wastewater and serve as the primary treatment unit in an onsite wastewater system. The septic tank provides skimming and storage of scum, settling and storage of the wastewater solids, and the partial digestion of accumulated solids by anaerobic action. Clarified effluent then flows from the septic tank to the absorption area or for further treatment.

2.48. **Septic Tank Manufacturer.** A person, firm, corporation or association who manufactures septic tanks, package treatment units or other components for onsite wastewater systems.

2.49. **Similarly Qualified Individual.** A bachelor's degree with 30 hours of natural science, engineering and/or math, or 3 years experience verified by the Department in the design of onsite wastewater systems.

2.50. **Sludge.** The accumulated solids that have settled to the bottom of a septic tank.

2.51. **Soil Absorption System.** The system for the final renovation of the septic tank effluent and return of the renovated wastewater to the hydrologic cycle, including the lateral lines, the perforated pipes, the rock or other approved material and the soil absorption trenches.

2.52. **Soil Horizon.** A layer approximately parallel to the surface of the soil distinguishable from adjacent layers by a distinctive set of properties produced by the soil forming process.

2.53. **Soil Pit.** An onsite excavation. The excavation shall be of adequate size to observe depth to seasonal water tables, depth to bedrock, or impervious layers. The soil pit is a minimum of 36 inches in width, and dug to provide ease of access such as steps or a moderate slope. The excavation shall be 4 feet in depth unless an impervious layer is encountered and shall provide an exposed sidewall area of at least 3 feet in length. It is used to observe those soil characteristics relevant in determining soil suitability for wastewater absorption and renovation.

2.54. **Soil Qualified Designated Representative.** A Designated Representative who has successfully passed the soils portion of the D.R. testing procedure, as set forth by the Department. These individuals are certified to size absorption areas based on depth to seasonal water tables.

2.55. **Soil Textural Class.** The relative proportions by weight of the three mineral fractions sand, silt, and clay as defined by the USDA soil texture classifications

2.56. **Stream.** A year round flowing stream as designated by the United States Geological Survey.

2.57. **Subdivision.** Land divided or proposed to be divided for predominantly residential purposes into such parcels as required by local ordinances, or, in the absence of local ordinances, subdivision means any land which is divided or proposed to be divided by a common owner or owners for predominantly residential purposes into 3 or more lots or parcels, platted or unplatted units any of which contains less than three acres, as a part of a uniform plan of development.

2.58. **Surface Discharging System.** Those systems that apply effluent directly to the soil surface or are sized less than that determined by seasonal water table loading rates as outlined in this regulation.

2.59. **True Water Table.** The upper surface of a saturated zone within the soil that is directly connected to a regional aquifer.

2.60. **Undisturbed Soil.** Soil which has developed by the actions of the soil forming processes and which has not been disturbed or altered by the human activities. Exception: plow layers less than 7 inches from the soil surface.

2.61. **Valid Permit.** A permit for construction is valid for a period of one year from the date of approval. A permit may be deemed invalid by the Authorized Agent before construction if the site and/or soil conditions have changed after approval or the information on the permit is inaccurate. A permit may be re-validated.

2.62. **Wastewater.** Any sewage containing animal or vegetable matter in suspension or solution, including but not limited to liquid wastes from toilets, kitchen sinks, lavatories, washing machines and other plumbing fixtures.

2.63. **Wet Season.** The period within a year when rainfall normally exceeds evapo-transpiration and a seasonal water table can be expected to be at its highest level in the soil.

Section 3. Variances and Exemptions

3.1. Requested variations from these Rules and Regulations will be considered and may be approved at the sole discretion of the Department.

3.2. Submission of proposed experimental onsite wastewater systems may be approved, disapproved, or approved on a trial basis for a specific period of time. Such approval or disapproval shall be at the sole discretion of the Department. Submission of an experimental design shall include design data as to the efficiency of operation of the proposed experimental system. A monitoring plan shall be submitted for approval in addition to the system design.

3.3. Good management practices. Good management practices are additions or modifications to systems which will make such systems more efficient, or which could make such systems acceptable in certain soil conditions. Where good management practices are proposed for inclusion in a soil absorption system, approval shall be at the discretion of the Department or its Authorized Agent.

3.4. Existing installation. No onsite wastewater system in existence on the effective date of these Rules and Regulations nor any onsite wastewater system installed after the effective date of these Rules and Regulations in a subdivision, wherein individual lots have been developed or sold for use with onsite wastewater systems for which a plat has been filed on record prior to the effective date of these Rules and Regulations shall be required to conform to more stringent specifications and requirements as to design, construction, density of improvements, lot size and installation than those standards contained in any applicable duly adopted and published regulations in effect at the time of

platting of record of such subdivisions. No onsite wastewater system to be installed on a residential lot for which the Department or its authorized agent has issued a construction permit on or before the effective date of these Rules and Regulations shall be required to conform to the design, construction and installation provisions of these Rules and Regulations. In a subdivision for which a master plan has been approved by the Department prior to the effective date of these Rules and Regulations or for which the Department has otherwise previously issued its written approval for the installation of onsite wastewater systems and where individual lots have been developed or sold in reliance upon such prior written approval, onsite wastewater systems shall not be required to conform to more stringent specifications as to design, construction and installation than those standards in effect at the time of, or referred to, in such prior written approval. However, it is provided, that any onsite wastewater system which is determined by the Department to be a health hazard or which constitutes a nuisance due to odor or unsightly appearance must conform to the provisions of these Rules and Regulations within 30 working days after notification that such determination has been made.

Section 4. Sewer Connection

4.1. All premises shall be connected to a sanitary sewer when within 300 feet and available to said premises when connection can be made without crossing another person's property. No privies, onsite wastewater systems or other receptacles for human excreta shall be constructed, maintained, or used on the premises. Plumbing fixtures shall be installed and maintained in accordance with the ARKANSAS STATE PLUMBING CODE. (see Ark. Code Ann.§§ 17-38-101-311)

4.2. When connection to an existing sanitary sewer system is not feasible and a large number of residences are to be built in an area, consideration should be given to the construction of a community sewer system and treatment plant. However, since an improperly operated or inadequately staffed community wastewater treatment plant cannot effectively treat wastewater, consideration should be given to the size of the proposed system to ensure that economically feasible sewer rates are sufficient to ensure proper treatment plant operation. As an aid to developers and engineers, the following information is offered to determine the feasibility of a public sewer system or onsite wastewater system.

Population Density	**Equivalent Lot Size**	**Service Economic Justification**
Over 5,000 persons per sq. mi.	Less than 1/2 acre	Public sewerage is justified
2,500-5,000 persons per sq. mi.	1/2 to 1 acre	Public sewerage normally is justified
1,000-2,500 persons per sq. mi.	1 to 2 acres	Public sewerage normally is not justified
less than 1,000 persons per sq. mi.	Over 2 acres	Public sewerage rarely is justified

Section 5. Permitting Requirements

5.1. A completed Onsite Wastewater System Permit Application and detailed plans and specifications following the requirements found in Appendix F for the collection, treatment and/or renovation facilities for all wastes of a domestic nature, containing a predominance of human excreta and exclusive of industrial wastes shall be submitted to and receive the approval of the Arkansas Department of Health or its authorized agent, prior to construction of a building or residence.

5.2. Onsite wastewater systems in subdivisions or in platted or unplatted lots or tracts of land as provided in Act 402, must be planned, designed and constructed in accordance with the RULES AND REGULATIONS PERTAINING TO GENERAL SANITATION and the RULES AND REGULATIONS PERTAINING TO ONSITE WASTEWATER SYSTEMS, of the Arkansas Department of Health. Permits for construction and operation of onsite wastewater systems must be obtained in accordance with the RULES AND REGULATIONS PERTAINING TO ONSITE WASTEWATER SYSTEMS, prior to the construction, installation or modification of the Onsite Wastewater System.

5.3. Permit requirement. It shall be unlawful for any person, firm, corporation, association, municipality or governmental agency to begin construction, alteration, repair or extension of any onsite wastewater system, owned by any other person, firm, corporation, association, municipality or governmental agency until the owner first obtains a valid Permit for Construction issued by the Department or its authorized agent.

5.4. It shall be unlawful for any person, firm, corporation, association, municipality or governmental agency to begin operation of any onsite wastewater system until such system has been inspected and approved by the Department or its authorized agent and the owner has first obtained a Permit for Operation issued by the Department or its authorized agent.

5.5. It shall be unlawful for any installer to begin construction, alteration, repair or extension of any onsite wastewater system owned by any other person, firm, corporation, association, municipality or governmental agency until the permit holder or installer first notifies the authorized agent a minimum 24 hours prior to the date he plans to begin work on said system. Emergency repairs may be undertaken without prior notification to the authorized agent provided a permit is obtained within ten working days.

5.6. To those cities or counties with authorized agents, the authorized agent shall be the authorized agent of the Department. In the event that an authorized agent has not been designated for a city or county, applications for onsite wastewater systems shall be made to the Department. Application forms and instructions may be obtained from the authorized agent or from the Department.

5.7. Plan review fee. A fee shall be levied for the review of each permit. Permit fees shall be made payable to the Department. The review fee must be paid before the issuance of

Part 1 of the Permit Application. There shall be no refund of the fee or any part thereof due to failure to proceed under the Permit Application. Construction must begin within one year of issuance or the permit must be re-validated by the Department or its authorized agent.

5.7.1. A fee shall be levied for the review of individual sewage disposal permit applications as follows:

5.7.1.1. For structures one thousand five hundred square feet (1,500 sq. ft.) or less, the fee to review a permit application is thirty dollars ($30.00):

5.7.1.2. For structures more than one thousand five hundred square feet (1,500 sq. ft.) and up to two thousand square feet (2,000 sq. ft.), the fee to review a permit application is forty-five dollars ($45.00);

5.7.1.3. For structures more than two thousand square feet (2,000 sq. ft.) and up to three thousand square feet (3,000 sq. ft.), the fee to review a permit application is ninety dollars ($90.00);

5.7.1.4. For structures more than three thousand square feet (3,000 sq. ft.) and up to four thousand square feet (4,000 sq. ft.), the fee to review a permit application is one hundred twenty dollars ($120.00):

5.7.1.5. For structures more than four thousand square feet (4,000 sq. ft.), the fee to review a permit application is one hundred fifty dollars ($150.00), and

5.7.1.6. For the alteration, repair or extension of any individual sewage disposal system, the fee to review a permit application is thirty dollars ($30.00).

5.7.2. In calculating the square footage of a residential structure for purposes of determining the applicable fee under this section, the square footage of all auxiliary areas of the residential structure shall not be considered.

5.7.2.1. Auxiliary areas include garages, carports, porches, and other similar areas as determined by the Division of Environmental Health Protection of the Department of Health.

5.8. Permit Procedure

5.8.1. Part I of the Permit is the Permit for Construction. Part I of the Permit Application form must be completed by a Designated Representative and approved by the Department or its authorized agent prior to initiating construction. The information to be reported in this portion includes the results of the percolation test, soil determination results, lot dimensions, system design, system layout and other information required by the Department or its authorized agent. **NO CHANGES OR ALTERATIONS MAY BE MADE TO THE SYSTEM PRIOR TO OR DURING CONSTRUCTION WITHOUT PRIOR APPROVAL OF THE AUTHORIZED AGENT.**

5.8.2. Part II of the Permit Application is the installation inspection. An installation inspection may be made during the construction of any onsite wastewater system. The inspection may be made during any phase of the installation.

5.8.2.1. It shall be the duty of the holder of the Permit for Construction or the installer to notify the authorized agent or Designated Representative, when the installation is ready for inspection. It shall be the duty of the owner or occupant of the property to give the Department, its authorized agent or designated representative, free access to the property at reasonable times for the purpose of making the installation inspection. ~~The installation shall not be covered without approval from the authorized agent.~~ Within five (5) days, the installer shall certify that the system has been installed pursuant to the approved permit.

5.8.2.2. The inspection may be made by the authorized agent, or may be made by the designated representative at the approval of the authorized agent.

5.8.2.3. In the event an inspection is not made 2 working days from the date of notification to the Department of Health, its authorized agent or designated representative, that the installation is completed and ready for inspection, elevation shots will be recorded and the system shall be deemed approved.

5.8.2.4. Any person aggrieved by the disapproval of an onsite wastewater system installation shall be afforded review as provided in Act 434 of 1967, the ARKANSAS ADMINISTRATIVE PROCEDURE ACT.

5.8.3. PART III of the PERMIT is the PERMIT FOR OPERATION. After approval of the inspection, the authorized agent will approve and issue a PERMIT FOR OPERATION. The system shall not be used until the PERMIT FOR OPERATION is issued. The authorized agent will retain the original and return the remaining copies to the owner.

5.8.4. Refusal of permit. Except as provided in Section 3.4, a PERMIT for the construction, alteration, repair, extension or operation of an onsite wastewater system or alternate/experimental system shall be refused where public sewer systems are reasonably available or economically feasible, or in instances where the issuance of such PERMIT is in conflict with the other applicable laws and regulations or where the issuance of such permit is in conflict with the public policy declared in Act 402 of 1977 as amended, except that emergency repairs may be undertaken without prior issuance of a PERMIT, provided a PERMIT is subsequently obtained within 10 working days after the repairs are made.

5.9. Subdivision Review

5.9.1. All subdivision plans which are proposed to utilize onsite wastewater systems as a method of wastewater treatment for all or part of the lots or tracts in said subdivision shall be submitted to the Arkansas Department of Health for review and approval of the overall plan for the utilization of onsite wastewater systems. Any lots or parcels within the boundaries of the proposed subdivision which are found to be unsuitable for subsurface onsite systems must be incorporated into surrounding lots or parcels. Areas designated as green or community space must be clearly identified and will

not be assigned a lot number or considered in the approval of the subdivision. ~~The procedure for subdivision review and approval shall be as follows:~~

5.9.2. Submission shall be made to the Local County Health Unit and shall include data on soil pits, percolation tests (if applicable), respective test location, location of nearest public or community sewer system, details as to topography and information as to the present and future land use of the subdivision and of adjoining lands, and such other information as may be required for the review. The Department will establish guidelines on subdivision plan submission and review policies. These guidelines will be updated periodically as necessary.

5.9.3. The Department shall review the submission to determine if onsite wastewater systems or alternate systems could effectively treat wastewater for the subdivision. Should the Department find the subdivision acceptable for onsite wastewater systems, prior to final approval it shall refer the submission to Engineering for their comments and recommendations with respect to the advisability and feasibility of a community sewer system and treatment plant or connection to a public sewer system. After receipt of comments and recommendations from Engineering, the Department shall approve or disapprove the submission and if disapproved, shall refer the applicant to Engineering for information, review and approval as to a community sewer system and treatment plant or connection to a public sewer.

5.9.4. The plan review fee will be a minimum of one hundred ($100.00) for one (1) lot and twenty-five dollars ($25.00) for each following lot, with a maximum of one thousand five hundred dollars ($1,500).

5.9.5. The following items will be included in all subdivision plans:

5.9.5.1. Vicinity map and legal description indicating the location of the subdivision

5.9.5.2. Layout of lot boundaries, streets, easements, all topographical features, and flood level of the area.

5.9.5.3. The corners of both the primary and secondary absorption areas must be sized and flagged on each lot and indicated on the plans.

5.9.5.4. Contour lines at 5 to 20 feet intervals shall be shown as relating to lot boundaries and the location of test performed.

5.9.5.5. Subdivision with wells will show proposed well location for each lot.

5.9.5.6. Features that may affect the location of the subsurface onsite wastewater systems should be identified. These include but are not limited to streams, existing wells, pipelines (oil, gas or water), power lines, topographic features, etc.

5.9.5.7. All lots will be designed for 3 bedroom residences unless otherwise indicated.

5.9.5.8. Subdivisions with Public Water Facilities require detailed engineering plans and specification for the water systems submitted by an engineer licensed in the State of Arkansas to the Engineering Section of the Arkansas Department of Health.

5.9.5.9. Addresses of all parties to receive copies of the subdivision.

5.9.5.10. Three (3) copies of the plans are required.

5.9.5.11. Flood level determination.

5.10. No surface discharging systems shall be allowed in subdivisions.

5.11. Primary and secondary absorption areas in a subdivision shall be sized according to natural soil conditions. Capping fill may be used to overcome separation to bedrock; however, no reduction in loading rate shall be granted for the purpose of determining minimum lot size. On lots less than three acres in size proposed for subdivision development, all undisturbed soils shall have a minimum depth of 13 inches or greater to a brief seasonal water table, and/or a depth of 18 inches or greater to an adjusted moderate seasonal water table, and/or a depth of 24 inches or greater to an adjusted long seasonal water table. Lots that do not meet the above minimum soil criteria must be three acres or larger and sized on natural soil conditions. Good management practices shall not be used for the purpose of determining minimum lot size.

5.11.1. Submission shall be made to the Local County Health Unit utilizing one of the following approved methods:

5.11.2. Subdivision Review and Soils Mapping

5.11.2.1. When utilizing soil mapping for subdivision review, the soil map shall be submitted by a Professional Soil Classifier. When soil mapping a subdivision for the purpose of designing subsurface onsite wastewater systems, a high intensity map is required. A high intensity map details the location and extent of the soils and landscape features sufficiently for site evaluation for subsurface wastewater renovation. The final report consists of a soils map and a soils report.

5.11.2.2. Field procedures for Mapping Subdivisions

5.11.2.2.1. Soil maps for subdivisions are to be made from a maximum grid of 100 feet. Grid points must be accurately located and identified using flags or stakes. A soil pit must be located at each grid point and identified with the corresponding flag or stake. The maximum distance allowed from a property line to an outside perimeter grid line is 50 feet.

5.11.2.2.2. The corners of both the proposed primary and secondary absorption areas must be sized and flagged on each lot.

5.11.2.2.3. A soil description must be made from each soil pit in accordance with the National Cooperative Soil Survey.

5.11.2.3. The Soil Map

5.11.2.3.1. The soil map should be compiled at a scale of 1 inch = 100 feet (1: 1,200).

5.11.2.3.2. The soil map must show all map units. A map unit is a collection of areas defined and named the same in terms of their soil properties. Each map

unit differs in some respect from all others and is uniquely identified on a soil map. Each individual area on the map is a delineation. Areas consisting of 625 square feet or more shall be delineated. Areas consisting of less than 625 square feet are inclusions and must be identified in the map unit description. Soil map units are to be named by their numerical ranking with respect to the soil loading rates designated for each map unit. Example: The unit with the highest loading rate for subsurface wastewater renovation will be named Map Unit 1.

5.11.2.3.3. When a soil pit is not located with the absorption areas, the primary and secondary absorption areas will be sized according to the most limiting loading rate from the range within the applicable map unit. Within a map unit, the absorption areas can be moved outside the designated primary and secondary areas without additional soils information by utilizing the most limiting loading rate or further soil evaluation in the specific area being proposed must be conducted.

5.11.2.3.4. The Legend must identify all symbols used on the soil map.

5.11.2.3.5. A signed statement must be on the soil map certifying the map was made in accordance with the current National Soil Survey Standards by a Registered Professional Soil Classifier Licensed in Arkansas.

5.11.2.3.6. The following statement must be on all soil maps. Any modification such as cutting, filling or compaction of the soil may change the nature of the soils, and may alter the suitability of the soils for the intended use and will therefore void the soil map.

5.11.2.4. The Soils Report

5.11.2.4.1. The soils report is a separate document that must be submitted as an attachment to the soil map. The report should consist of the following.

5.11.2.4.2. Each map unit identified on the soils map must have a typical pedon description. Terms used in the description must be those used by the National Cooperative Soil Survey.

5.11.2.4.3. The range in characteristics for each soil map unit must be given. The characteristics must include but are not limited to color, texture, redoximorphic features and depth to bedrock. Ranges should be narrow enough that interpretations will not be different for soils with the same typical pedon.

5.11.2.4.4. Interpretations for each typical pedon must be included in the soils report. The minimum interpretations required include: seasonal water table duration, hydraulic conductivity classes, depth to bedrock and the range of soil loading rate.

5.11.2.4.5. A signed statement must be on the soils report certifying the report was made in accordance with the current National Soil Survey Standards by a Registered Professional Soil Classifier.

5.11.3. Sizing based on Seasonal Water Table loading rates without Soil Mapping

5.11.3.1. Designative Representatives utilizing soil morphology method must be soil certified. The following information or items must be included.

5.11.3.2. A minimum of one soil pit in both the primary absorption and secondary absorption area is required. Soil pit information must include depth to rock, impermeable soil layers and seasonal water tables.

5.11.3.3. Loading rates used to size primary and secondary sites must be given.

5.11.3.4. The corners of both the proposed primary and secondary absorption areas must be sized and flagged on each lot.

5.11.4. Sizing based on Percolation Test Data

5.11.4.1. A minimum of one soil pit in both the primary absorption and secondary absorption area is required. Soil pit information will include information of depth to rock, impermeable soil layers, and estimated depths to seasonal water tables.

5.11.4.2. If the soil is considered acceptable based on the information above, a minimum of one percolation hole in both the primary and secondary absorption areas is required.

5.11.4.3. Percolation rates used to size the primary and secondary site must be given.

5.11.4.4. Lots sized using percolation test data must not be smaller than that required by seasonal water table loading rates.

5.11.4.5. The corners of both the proposed primary and secondary absorption areas must be sized and flagged on each lot.

5.11.5. Construction of any type shall not begin upon any lot in the subdivision until final approval of the submission for utilization of onsite wastewater systems within the subdivision has been made by the Department.

5.11.6. Property Owners' Associations that construct and maintain or have constructed and maintained wastewater treatment facilities in accordance with standards and regulations established by the Arkansas Department of Health or the Arkansas Department of Environmental Quality and that desire to exercise general supervision and authority over the treatment of wastewater within and for the subdivided area over which their authority extends, may request the Department or in the case of onsite wastewater systems, or Engineering, in the case of community wastewater treatment systems, to delegate such parts of its authority as the Property Owners' Association wishes to exercise. The Department may, at its discretion, delegate any

of its authority in the administration of these Rules and Regulations as it shall deem proper and in accordance with the following.

5.11.6.1. In the event, that such Property Owners' Association constructs and maintains all onsite wastewater systems within the subdivided area over which their authority extends, the Department, after determining by the procedure set forth in Section 5.9 that the use of the onsite wastewater systems within the subdivision is acceptable, may, at its discretion, delegate the Property Owners' Association general supervision and authority over the location, design, construction, installation and operation of onsite wastewater systems subject, however, to compliance with these Rules and Regulations and to the use of the permit forms established under these Rules and Regulations and to the final approval of each permit by the authorized agent of the Department.

5.11.6.2. In the event that such Property Owners' Association constructs and maintains all community wastewater treatment systems within the subdivided area over which their authority extends, Engineering may, at its discretion, delegate general supervision and authority over the location, design, construction, installation and operation of such community wastewater treatment systems subject to compliance with applicable Rules and Regulations of the Department of Health and of the Arkansas Department of Environmental Quality, and subject to final approval of designs and issuance of permits as required by said applicable Rules and Regulations. Such compliance shall be to the same degree and extent as would apply if the Property Owners Association were a municipality.

Section 6. System Location

6.1. These distances shall be used only where ideal conditions indicate them to be sufficient, and greater distance shall be required where local conditions demand. All waivers except with public water supplies involved must be submitted to and approved by the Department. Waivers affecting public water supplies must be submitted to and approved by Engineering. Details pertaining to local water wells, such as depth, type of construction, vertical zone of influence, etc., together with data on the geological formations and porosity of subsoil strata, should be considered in determining the safe allowable distance between wells and subsurface onsite wastewater systems.

6.2. Minimum Horizontal Distances.

6.2.1. All facilities used for the collection, treatment, and renovation of wastewater must be at least 300 feet from the high water mark of any body of water, if within one quarter mile of a public water supply intake on that body of water.

6.2.2. All facilities used for the collection, treatment, and renovation of wastewater must be at least 300 feet from any spring used as a public water supply.

6.2.3. All facilities used for the collection, treatment, and renovation of wastewater must be at least 100 feet from any source of domestic water supply.

6.2.4. All facilities used for the collection, treatment, and renovation of wastewater must be at least 100 feet from the high water mark of any stream or lake.

6.2.5. All facilities used for the collection, treatment, and renovation of wastewater must be at least 50 feet from any pond on the same property and 100 feet from any pond on adjacent properties.

6.2.6. All facilities used for the collection, treatment, and renovation of wastewater must be at least 10 feet from any dwelling or building.

6.2.7. All facilities used for the collection, treatment, and renovation of wastewater must be at least 10 feet from all property lines.

6.2.8. All facilities used for the collection, treatment, and renovation of wastewater must be at least 10 feet from any water service line.

6.2.9. Provided that the tank is water-tight, tested on site, and approved by the Department, a variance may be granted for tank locations that do not meet the above listed minimum horizontal distance separations.

Section 7. Minimum Lot Size

7.1. For the purpose of determining minimum lot size, all lots must have suitable primary and secondary absorption areas, sized according to natural soil data. Good management practices shall not be used for the purpose of determining minimum lot size. However, in no case shall a wastewater system utilizing subsurface renovation be approved regardless of lot size if soils are not suitable for subsurface renovation.

7.2. If an individual water well supply and an onsite wastewater system are proposed, the lot size must be such that the well shall be located at least 50 feet from any lot line, and at least 100 feet from any part of the onsite wastewater system proposed on the same lot and onsite wastewater systems proposed on any adjacent lots. Wells should be located up slope from wastewater systems if possible. Both primary and secondary onsite wastewater systems shall conform to all set back requirements established under Section 6.2 of this regulation.

7.3. If a public water supply is proposed and an onsite wastewater system is to be used, the lot size must be such that a primary absorption area and a secondary absorption area are present. Both absorption areas must conform to the set back requirements outlined in Section 6.2 of this regulation.

Section 8. Soil Criteria

8.1. The first step in the design of any onsite wastewater system is to determine the suitability of the soil. A minimum of 2 soil pits is required to determine the suitability of a site. One pit must be in the area of the proposed primary absorption area and one pit must be in the area of the proposed secondary absorption area. The soil pits must be left open for use by the authorized agent. Depths to seasonal water tables, bedrock (if encountered), and the

type and depth of the various soil layers including both pervious and impervious strata and their relationship with the proposed soil absorption system's other impervious strata shall be reported. No soil absorption system shall be installed in fill material.

8.2. Soil Separation Distances

The following are minimum soil separation distances from the bottom of the proposed absorption trench to the true water table (aquifer) and bedrock. These conditions must be met before the soil is considered suitable for subsurface renovation.

8.2.1. True Water Tables

Moderate Hydraulic Conductivity	24 inches
High Hydraulic Conductivity	36 inches

8.2.2. Bedrock

Moderate Hydraulic Conductivity with redoximorphic features indicating SWT of moderate duration or longer	18 inches
Moderate Hydraulic Conductivity with no redoximorphic features or redoximorphic features indicating a brief SWT	24 inches
High Hydraulic Conductivity	36 inches

8.3. Hydraulic Conductivity Classes

The hydraulic conductivity class may be estimated using the following.

8.3.1. High hydraulic conductivity. Natural soil horizons which have not been compacted by human activities, especially vehicle traffic and tillage operations, and are in the following particle size classes

Sandy. The texture of the fine earth is sand or loamy sand but not loamy very fine sand; very fine sand with rock fragments making up less than 35% of the volume.

Fragmental. Stones, cobbles, gravel, and very coarse sand particles; too little fine earth to fill some of the interstices larger than 1 millimeter.

Sandy-skeletal. Rock fragments 2 millimeters in diameter or larger make up 35% or more by volume; enough fine earth to fill interstices larger than 1 millimeter; the fraction finer than 2 millimeters is sandy as defined for the sandy particle size class.

8.3.2. Moderate hydraulic conductivity. Natural soil horizons which clearly have some soil structure other than platy, which have not been compacted by human activities,

especially vehicle traffic and tillage operations, and which are in one or more of the following particle size classes

Loamy. The texture of the fine earth is loamy very fine sand, or finer, but the amount of clay is less than 35%; rock fragments are less than 35% by volume.

Loamy-skeletal. Rock fragments make up 35% or more by volume; enough fine earth to fill voids larger than 2 millimeters; the fraction finer than 2 millimeters is loamy as defined for the loamy particle size class.

8.3.3. Low hydraulic conductivity. Included are all soil horizons which have platy structure, or (clearly) fraigipan horizons or horizons which have been compacted by the human activities, especially vehicle traffic and tillage operations. Also included are horizons with the following particle size classes:

Clayey. The fine earth contains 35% or more clay and rock fragments are less than 35% by volume.

Clayey-skeletal. Rock fragments make up 35% or more by volume; enough fine earth to fill voids larger than 1 millimeter; the fraction finer than 2 millimeters is clayey as defined for the clayey particle size class.

8.4. Seasonal Water Table (SWT) Classes

The depth to seasonal water tables of 3 durations can be estimated from the following guides. The guides are interpretations of redoximorphic features, a type of soil morphology which results from reduction-oxidation processes. All colors are for moist conditions. Place each horizon in the most limiting class in which it will fit.

The placing of soil horizons into SWT classes based on redoximorphic features is an interpretation and requires some understanding of soil development processes. Redoximorphic features are not expected to occur unless the horizon has been both saturated and reduced. Reduction is not expected to occur until after the horizon has been saturated for some period of time.

8.4.1. Horizons with dissimilar color patterns on ped surfaces and ped interiors

8.4.1.1. Brief: Soil horizons which have seasonal water tables of brief duration contain one or more of the following.

Concentrations or depletions on ped surfaces with chroma ≥ 3, not greater than 50% or more chroma 3 on ped surfaces.

Manganese masses on 2% or more of the ped surface

Iron or manganese nodules or concretions 2 millimeters in diameter or larger

Note: Iron/Manganese nodules or concretions with clear to sharp boundaries and the absence of iron/manganese accumulations on the

surface of the nodule or concretion are not indicative of contemporary seasonal water table levels.

8.4.1.2. Moderate: Soil horizons which have seasonal water tables of moderate duration contain one or more of the following.

Some chroma ≤2 on ped surfaces

50% or more chroma 3 on ped surfaces

35 to 49% clay

8.4.1.3. Long: Soil horizons which have seasonal water tables of long duration contain one or more of the following.

Chroma ≤2 on 70% or more of the ped surfaces

Chroma ≤2 on 50% or more of the ped surfaces with some chroma of 2 or less in ped interiors

50% or more clay

8.4.2. Horizons with similar color patterns on ped surfaces and ped interiors and horizons without peds

8.4.2.1. Brief: Soil horizons which have seasonal water tables of brief duration contain one or more of the following

Concentrations or depletions with chroma ≥3, not greater than 20% chroma 3

Iron or manganese nodules or concretions 2 millimeters in diameter or larger

Note: Iron/Manganese nodules or concretions with clear to sharp boundaries and the absence of iron/manganese accumulations on the surface of the nodule or concretion are not indicative of contemporary seasonal water table levels.

8.4.2.2. Moderate: Soil horizons which have seasonal water tables of moderate duration contain one or more of the following.

Chroma ≤2 on less than 50% of the mass

Chroma 3 in more than 20% of the mass

35 to 49% clay

8.4.2.3. Long: Soil horizons which have seasonal water tables of long duration contain one or more of the following.

Chroma ≤2 in 50% or more of the mass

50% or more clay

8.4.3. Soil horizons that have chroma and value of ≤ 3 due to high organic matter contents (A horizons) present problems for SWT interpretations. Also uncoated grains which result from prolonged leaching with organic acids (E horizons) are not considered to be an indication of a SWT. These horizons (A and E) shall be considered to contain SWT's only if they also contain high or low chroma colors. A plowed horizon (Ap), which has chroma of 3 or less, shall not be considered to contain an SWT unless the first underlying horizon contains an SWT. The duration of the SWT in a plowed horizon (Ap) with chroma ≤ 3 and in A and E horizons with chroma ≤ 3 and high or low chroma colors shall be the same as in the first underlying horizon.

8.4.4. Soils with 35% or more clay that are low or moderate shrink-swell, with a hue of 5YR or redder typically formed over sandstone, siltstone, limestone, and chert may have higher hydraulic conductivities and seasonal water tables of shorter duration than indicated by the above characteristics. These soils will be considered moderate hydraulic conductivity and sized according to redoximorphic features. Alluvial soils such as those deposited by the Arkansas and Red Rivers and soils formed from shale are high shrink-swell and are not included in this exception.

8.4.5. Some soils may exhibit redoximorphic features that are not indicative of current soil conditions. In such soils, monitoring wells or piezometers may be necessary to determine current soil wetness conditions. Monitoring must be done during the wet season.

8.4.6. Monitoring Requirements

8.4.6.1. A property owner or their representative has the option to use observation wells and/or piezometers to demonstrate that redoximorphic features are not an indication of zones of saturation. The following procedures for the use of observations wells/piezometers to determine the depth and duration of seasonal water tables shall be implemented.

8.4.6.2. The property owner or their representative shall notify the Department, in writing, of the intent to use observation wells and/or piezometers to determine the seasonal water tables.

8.4.6.3. On individual lots at least one (1) observation wells and/or piezometers shall be installed and monitored on a site within both the proposed primary and secondary absorption areas. If in the judgment of the Department, more than one (1) is needed, the property owner or their representative shall be notified. For subdivision evaluation, at least one (1) observation well and/or piezometer shall be installed in each soil mapping unit. However, a minimum of one (1) observation well and/or piezometer per acre is required.

8.4.6.4. The wells and/or piezometers shall extend at least 36 inches into the natural soil. The Department reserves the right to determine the depth of all well

and/or piezometers. In soils with fragipan, the observation well and/or piezometer must not be installed deeper than the top of the fragipan.

8.4.6.5. All plans and specifications for observation wells/piezometers shall be submitted and installed under the supervision of a Professional Soil Classifier. NOTE: Individuals submitting monitoring plans must have demonstrable training and/or experience in monitoring of seasonal water tables.

8.4.6.6. Monitoring of seasonal water tables shall be conducted by a Professional Soil Classifier or Designated Representative.

8.4.6.7. Under no circumstances will the property owner/developer be allowed to monitor the water levels.

8.4.6.8. The monitoring period is from December 1st through May 15th of the following year to verify the depth and duration of the seasonal water tables during years of normal precipitation for this time period. Depending on when peaks are observed, the Department may or may not accept the monitoring for the time period. A near normal reporting period is defined as a period that has plus or minus one standard deviation of the long term mean annual precipitation. (Long term refers to 30 or more years.) Also, the mean monthly precipitation during a normal period must be plus or minus one standard deviation of the long-term monthly precipitation for 8 of the 12 months. For the most part, normal years can be calculated from the mean annual precipitation.

8.4.6.9. The Department shall field check the monitoring periodically during the time of expected saturated soil conditions at its discretion.

8.4.6.10. The Department may, at any time during the observation period, verify the observed water depth by conducting a soil boring next to, and of equal depth with, any of the observation wells/piezometers. The well may be declared invalid by the Department if the water level after 24 hours without precipitation, presents a discrepancy with the observed water level in the data collected. The owner will be notified by the Department of such findings.

8.4.6.11. When monitoring determines that the site is suitable, the Department will request that a new site evaluation be submitted. The monitoring information must be incorporated into the new site evaluation.

8.4.6.12. Some soils have been extensively studied and have no contemporary seasonal water tables. These specific areas may be exempted from the soil redoximorphic features but must be sized by Hydraulic Conductivity or percolation rates. Only specific areas recognized by the Department may be exempted without the monitoring requirements outlined in this regulation.

8.4.7. Lowering Seasonal Water Tables

8.4.7.1. Interceptor Drains. Interceptor drains can be utilized to lower or eliminate the brief seasonal water table on sites with 3% or more slope in portions of the

soil that have moderate or high hydraulic conductivity. Approval of any reduction in seasonal water table depth is at the sole discretion of the Department or its authorized agent. (See Appendix H, figure 8.)

8.4.7.2. Capping Fill. The depth of the observed seasonal water table may be increased by a factor equal to half the depth of the settled fill up to a maximum adjustment of 7 inches. Capping fills are outlined in Section 9.8 of this regulation. Systems incorporating capping fills shall be designed to load to the surface of the settled cap in order to utilize the adjustment credited for the applied cap.

8.5. On lots less than 3 acres, prior to adjustment for capping fill, where the slope is less than or equal to 12%, all undisturbed soils exhibiting a depth of 13 inches or greater to a brief seasonal water table, and/or a depth of 18 inches or greater to an adjusted moderate seasonal water table, and/or a depth of 24 inches or greater to an adjusted long seasonal water table must utilize a subsurface onsite wastewater systems as outlined in this regulation.

8.6. On lots of 3 acres or greater, prior to adjustment for the capping fill, all undisturbed soils exhibiting a depth of 12 inches or greater to a brief seasonal water table, and/or a depth of 16 inches or greater to an adjusted moderate seasonal water table, and/or a depth of 20 inches or greater to an adjusted long seasonal water table must utilize a subsurface onsite wastewater systems as outlined in this section.

Section 9. Standard Systems

9.1. A standard onsite wastewater system consists of a field of perforated pipe surrounded by gravel, or other product approved by the Department and installed in such a manner that the clarified effluent from the septic tank or pretreatment unit will be distributed with reasonable uniformity into the natural soil. The individual absorption trench should not be more than 60 feet long, with a maximum length of 100 feet, and the trench bottom and perforated pipe or gravel substitute should be installed at a grade of 0 to 2 inches per 100 feet. In order to ensure even distribution of the effluent, all onsite wastewater systems utilizing a distribution box must have absorption trenches of the same length. Onsite wastewater systems utilizing serial distribution of the effluent must be provided with an approved diversion device to allow drying of the most used absorption trenches. The most used absorption trench should be allowed to drain and dry out during the summer months. In all cases, a minimum of 2 absorption trenches is required to ensure that the absorption area will function even if one absorption trench is disturbed.

9.2. Many different designs may be used in laying out absorption trenches. The choice may depend on the size and shape of the available absorption area, the area required, and the topography of the absorption area. In all gravity flow designs, the septic tank flow line must be at or above the ground elevation of the highest trench. In all designs requiring five hundred (500) linear feet or more of absorption trench, mechanical dosing is required.

9.3. Soil absorption areas utilizing pipe and gravel provide for a trench 24 inches wide, with a standard trench depth of 18 inches from the bottom of the trench to the finished settled grade. Systems designed with trench depths up to 24 inches may be utilized. There shall

be a minimum of 6 inches of gravel below the pipe and a minimum of 2 inches of gravel above the pipe. A minimum of 6 inches of cover is required above the gravel bed or gravel substitute. The trench depth may vary in those instances where the soil absorption area was designed to overcome limiting soil characteristics. Trench depths must be specifically called for in the Designated Representative's design and approved by the authorized agent. The absorption area in square feet is twice the total length of the trenches. The minimum spacing between the trenches shall be 6 feet between the trenches and 8 feet center to center. Increased separation between trenches is encouraged to enhance the effectiveness of the trenching system.

9.4. All gravel substitute products approved by the Department must be a minimum of 8 inches in height and may not exceed 24 inches in width. The D.R. must specify the product name and model to be installed when utilizing a gravel substitute in the system design.

9.5. Effluent Strength

9.5.1. Septic tank effluent when applied to the soil causes a clogging layer to form. This layer is called a biomat. The biomat, while increasing treatment performance, reduces the infiltrative capacity of the soil. Septic tank effluent is considered high strength if it possesses anything outside of the parameters of residential strength wastewater (see definitions). The Designated Representative must indicate the assumed strength of the wastewater entering the system and the effluent values that the intended design is to achieve. Soil loading rate charts (Appendix A/Table 1) do not take into consideration the organic loading to the soil. Loading rates found in Appendix A/Table 1 can only be used when the wastewater strength has been reduced to residential strength levels.

9.5.2. Establishments with limited or no food preparation and which have effluent strength similar to residential effluent need no special treatment other than periodic monitoring. Establishments or structures producing high levels of grease and oils, or high TSS or high BOD_5 must reduce wastewater strength prior to disposal. High strength effluent reducing systems must be monitored and managed by licensed CMP.

9.6. Sizing the Absorption Area

If the soil is acceptable for the installation of subsurface absorption trenches, a percolation tests or a seasonal water table determination shall be made at points selected as typical of the area in which the absorption trenches will be located. Only a Soil Qualified Designated Representative may design subsurface absorption systems based on seasonal water table data.

9.6.1. Sizing the system based on Seasonal Water Table Data

When a seasonal water table of more than one duration is present in a soil, the loading rate is determined as follows.

Determine the depth of each seasonal water table.

Adjusting the moderate seasonal water table:

Subtract the depth to the brief SWT from the depth to the moderate SWT and divide by 3;

Subtract the result from the depth to the moderate SWT to obtain the adjusted moderate SWT.

Adjusting the long seasonal water table:

Subtract the adjusted moderate SWT from the depth to the long SWT and divide by 2;

Subtract the above number from the depth to the long SWT to obtain the adjusted long SWT;

Adjusting the long seasonal water table where only brief and long seasonal water tables are encountered:

Subtract the depth to the brief SWT from the long SWT and divided by 6;

Subtract the above number from the depth to the long SWT to obtain the adjusted long SWT.

Compare the loading rates for the brief, adjusted moderate and adjusted long duration seasonal water table using the soil loading charts.

Use the most restrictive loading rate to determine the size of the absorption area.

Soils that only have one duration of seasonal water table are loaded by using the loading rate given in the soil loading charts for the duration of seasonal water table observed.

9.6.2. Sizing the soil absorption area based on Percolation Data

9.6.2.1. Procedures of percolation tests

9.6.2.1.1. Number and location of tests. Three (3) or more test holes spaced uniformly over the primary absorption area and one (1) test hole in the secondary absorption area are required. Percolation tests shall be performed at the depth of the proposed soil absorption system.

9.6.2.1.2. Type of test holes. The depth of a standard percolation test hole is 18 inches and the diameter shall be 12 inches. If soil and site characteristics indicate that a deeper or shallower system is desired, then the percolation test shall be run at the depth of the bottom of the proposed absorption trench.

9.6.2.1.3. Preparation of test holes. Carefully scratch the bottom and sides of the holes with a knife blade or sharp-pointed instrument, in order to remove any smeared soil surfaces and to provide a natural soil interface into

which water may percolate. Remove all loose material from the holes. Add 2 inches of coarse sand or fine gravel to protect the bottom from scouring and sediment.

9.6.2.1.4. Saturation and swelling of the soil. It is important to distinguish between saturation and swelling. Saturation means that the void spaces between soil particles are full of water. This can be accomplished in a short period of time. Swelling is caused by intrusion of water into the individual soil particles. This is a slow process, especially in clay-type soil, and is the reason for requiring a prolonged soaking period. To conduct the test, carefully fill the holes with clear water to a minimum depth of 12 inches above the gravel and maintain at this level, preferably overnight, but no less than 4 hours. This may be achieved by the use of an automatic siphon. This procedure is to ensure that the soil is given time to swell and to approach the condition it will be in during wet seasons of the year.

9.6.2.1.5. After the saturation period, adjust the depth of water in the holes to 6 inches above the gravel. From a fixed reference point, measure the drop in water level at the end of a 30-minute period, refilling 6 inches above the gravel as necessary. The drop of water level that occurs during the 30-minute period is used to calculate the percolation rate.

9.6.2.1.6. In soils in which the first 6 inches of water seeps away in less than 30 minutes after the 24-hours or greater saturation period), the time interval between measurements shall be taken at 10 minutes and the test run for one hour. The drop that occurs during the final 10 minutes is used to calculate the percolation rate.

9.6.2.2. The size of the absorption area may be determined from the results of the percolation test and the data in Appendix A. As noted in Appendix A, soil in which the percolation rate is greater than 75 minutes per inch (mpi) is unsuitable for a standard soil absorption system.

9.6.2.3. The size of the absorption area for a system sized using percolation rate data shall not be smaller than that required by seasonal water table data for the same site.

9.7. Serial Distribution

9.7.1. Serial distribution may be used when maximum storage can be achieved for all lines. The overflow point of the tee must be at the ground level of the line served. However, when maximum storage can not be achieved, Appendix G (Loss Storage Formula) must be used for sizing the system.

9.7.2. Serial distribution systems designed under percolation test shall not be smaller than required by seasonal water table data.

9.8 Capping Fill Systems

9.8.1 Soil absorption systems shall not be installed in fill material. However, fill material

may be used as a cap over the natural soil surface to increase the volume available for the storage of effluent.

9.8.2 Where capping fill is incorporated in the design of an onsite wastewater system, the Distribution system shall be capable of storing effluent to the top of the settled cap.

9.8.3 The absorption trenches on capping fill systems must be designed and installed in the natural soil. However, a variance as provided in 3.1 and 3.2 can be requested to install the absorption trenches partially in the fill, no less than 4 inches into the natural soil, to overcome bedrock separation requirements. Systems utilizing capping fill shall have a minimum 6 inches of settled cover above the gravel bed or gravel substitute.

9.8.4 The slope of the absorption area cannot exceed 12%. Submitted plans must indicate both the original and the finished elevations referenced to a benchmark.

9.8.5 For absorption areas exhibiting slopes of 6% or less, the full depth of fill must extend a minimum of 10 feet beyond the edge of the absorption trench then graded at a three to one or less slope. The fill area must be seeded and watered regularly to prevent erosion. (See Appendix H, figures 4 and 5.)

9.8.6 For absorption areas exhibiting slopes greater than 6% the full depth of fill must extend 1 foot beyond the absorption area on the up hill side, 10 feet on the sides of the absorption area, and 20 feet on the down hill side of the absorption area and then all sides graded to a three to one slope or less thereafter. The fill area must be seeded and watered regularly to prevent erosion. (See Appendix H, figures 6 and 7.)

9.8.7 For absorption areas exhibiting slopes greater than 6%, a berm and/or drainage ditch to divert surface water is required. The berm and/or drainage ditch shall be constructed no more than 10 feet up slope from the absorption area and extending a minimum 10 feet beyond the applied capping fill.

9.8.8 On slopes of greater than 12%, a variance for capping fill systems may be granted in accordance to sections 3.1 and 3.2.

9.8.9 The fill material used must be a uniform loamy soil with maximum clay content of 27%. The depth of fill above the original ground surface is measured after settling. Loamy soils can be expected to settle 25%.

9.8.10 The absorption area and borrow site must be scarified to destroy and remove the vegetative material. The absorption area must be tilled to a minimum depth of 4 inches. Stumps should be left in place at the absorption area to prevent extensive disruption of the soil.

9.8.11 Where capping fill is incorporated into the design of a system, only track equipment may be utilized when applying the cap.

9.8.12 The soil cap is a part of the soil absorption system and shall meet all the setbacks outlined in Section 6.2 of this regulation.

9.9 Dosing Standard Systems