FREMONT COUNTY
ON-SITE WASTEWATER TREATMENT SYSTEM REGULATIONS

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1 . Authority

This regulation is promulgated pursuant to the On-site Wastewater Treatment System Act, 25-10-101, et seq. C.R.S.

2 . Scope and Purpose

A. Declaration / Title

1. In order to preserve the environment and protect the public health and water quality; to eliminate and control causes of disease, infection, and aerosol contamination; and to reduce and control the pollution of the air, land and water, it is declared to be in the public interest to establish minimum standards and regulations for On-site Wastewater Treatment Systems (OWTS) in the state of Colorado and to provide the authority for the administration and enforcement of such minimum standards and regulations.

2. This regulation will apply to On-site Wastewater Treatment Systems as defined in section 25-10-103(12), C.R.S. and shall be known as the FREMONT COUNTY ON-SITE WASTEWATER TREATMENT SYSTEM REGULATIONS.

B. Purpose

1. The purpose of this regulation as authorized by the OWTS Act is to establish minimum standards for the location, design, construction, performance, installation, alteration and use of OWTS within the state of Colorado, and establish the minimum requirements for regulations adopted by THE FREMONT COUNTY BOARD OF HEALTH including but not limited to permit application requirements; requirements for issuing permits; the inspection, testing, and supervision of installed systems; the maintenance and cleaning of systems; the disposal of waste material and the issuance of cease and desist orders.

C. Effluent Discharged to Surface Waters

1. Any system that will discharge into State waters must be designed by a professional engineer. The discharge permit application must be submitted for preliminary approval to the Fremont County Public Health Department. Once approved by the Fremont County Public Health Department, the application must be submitted to the Water Quality Control Division for review in accordance with the Water Quality Control Act, 25-8-101, et seq. C.R.S, and all applicable regulations of the Water Quality Control Commission. Compliance with such a permit will be deemed full compliance with this regulation.

D. Jurisdiction of Fremont County Health Agencies

1. The jurisdiction of the Fremont County Public Health Agency extends over all unincorporated areas and over all municipal corporations within the territorial limits of the county or the counties comprising the district public health agency, but not over the territory of any municipal corporation that maintains its own public health agency.

3. Definitions:

1. **Absorption system:**
   A leaching field and adjacent soils or other system for the treatment of sewage in an On-site Wastewater Treatment System by means of absorption into the ground. See Soil treatment area.
2. **Accessible:**
   It means easily reached, attained or entered by the necessary equipment or maintenance provider.
3. **Alteration (Alter):**
   Means to change in character or composition of the OWTS. This includes any Modification to the OWTS resulting in a small yet significant difference.
4. **Applicant**:
   A person who submits an application for a permit for an On-site Wastewater Treatment System.
5. **Auxiliary building:**
   It means a non-residential structure, located on the same lot or parcel as the principal structure, and for an incidental use to the principal structure.
6. **Basal Area:**
   The effective area available to transmit the treated effluent from the filter media in a mound system into the in-situ receiving soils. The perimeter is measured at the interface of the imported material and in-situ soil. On sloping sites, only the area down-gradient from the up-slope edge of the distribution media may be included in the calculation.
7. **Bed:**
   A below-grade soil treatment area with a level sub-base consisting of a shallow excavation greater than three feet wide containing distribution media and more than one lateral.
8. **Bedrock:**
   Continuous rock that underlies the soil or is exposed at the surface. Bedrock is generally considered impervious, but if fractured or deteriorated, it may allow effluent to pass through without adequate treatment.
9. **Bedroom:**
   A room with an egress window, a closet, and/or is intended for sleeping purposes; or as defined by the local board of health, as stated in the local OWTS regulation.
10. **Biochemical Oxygen Demand, Five-Day: (BOD_5)**
    Quantitative measure of the amount of oxygen consumed by bacteria while stabilizing, digesting, or treating biodegradable organic matter under aerobic conditions over a five-day incubation period; expressed in milligrams per liter (mg/L).

11. **Biochemical Oxygen Demand, Carbonaceous Five Day: ($CBOD_5$)**
Quantitative measure of the amount of oxygen consumed by bacteria while stabilizing, digesting, or treating the organic matter under aerobic conditions over a five-day incubation period while in the presence of a chemical inhibitor to block nitrification; expressed in milligrams per liter (mg/L).

12. **Building sewer:**
Piping that conveys wastewater to the first system component or the sewer main.

13. **Carbonaceous Biochemical Oxygen Demand:**
See Biochemical Oxygen Demand, Carbonaceous.

14. **Cesspool:**
An unlined or partially lined underground pit or underground perforated receptacle into which raw household wastewater is discharged and from which the liquid seeps into the surrounding soil. Cesspool does not include a septic tank.

15. **Chamber:**
An arch-shaped structure providing an open-bottom soil interface with permeable sidewalls, used for distribution of effluent in a soil absorption system.

16. **Cistern:**
An enclosed unpressurized reservoir or tank for storing water as part of a potable water supply system.

17. **Cleaning:**
The act of removing septage or other wastes from a wastewater treatment system component or grease/waste from a grease interceptor.

18. **Colorado Plumbing Code:**
Rules and Regulations of the Colorado State Plumbing Board
(3 CCR 720-1).

19. **Commission:**
The Water Quality Control Commission created by section 25-8-201, C.R.S.

20. **Competent technician:**
A person who has the appreciate expertise and is able to conduct and interpret the results of soil profile test pit excavations, percolation test, and site evaluations. This individual has also met the required "Competent Technician" as defined section V.5.I

21. **Component:**
A subsection of an On-site Wastewater Treatment System; a component may include multiple devices.

22. **Composting toilet:**

A self-contained waterless toilet designed to decompose non-water-carried human wastes through microbial action and to store the resulting matter for disposal.

23. **Consistence:**
The degree and kind of cohesion and adhesion that soil exhibits and/or the resistance of soil to deformation or rupture under an applied stress to an extent that the soil density would restrict permeability. Aspects of consistence are used to determine if the horizon will have permeability lower than that of the defined soil type. Additional insight to consistence can be found in the USDA-NRCS Field book for Describing and Sampling Soils; Version 3.0, Sept. 2012.

24. **Crest:**
The highest point on the side of a dry gulch or cut bank.

25. **Cut - bank:**
A nearly vertical slope caused by erosion or construction that has exposed soil strata.

26. **Deep gravel system:**
A soil treatment area for repairs only where the trenches utilize a depth of gravel greater than 6 inches below the distribution pipe and sidewall area is allowed according to a formula specified in this regulation.

27. **Deficiency:**
See Malfunction.

28. **Department:**
The Department of Public Health and Environment created by section 25-1-102, C.R.S.

29. **Design:**
    1. The process of selecting, sizing, locating, specifying, and configuring treatment train components that match site characteristics and facility use as well as creating the associated written documentation; and
    2. Written documentation of size, location, specification and configuration of a system.

30. **Design capacity:**
See Flow, Design.

31. **Design flow:**
See Flow, Design.

32. **Designer, on-site wastewater treatment system**:
A practitioner who utilizes site evaluation and investigation information to select an appropriate OWTS and prepares a design document in conformance with this regulation.

33. Disinfection:
The process of destroying pathogenic microorganisms in sewage through the application of ultraviolet light, chlorination, or ozonation.

34. Distribution:
The process of dispersing wastewater or effluent to one or more components, devices, or throughout a soil treatment area.

35. Distribution box:
A watertight component that receives effluent from a septic tank or other treatment unit and distributes effluent via gravity in approximately equal portions to two or more distribution laterals in the soil treatment area.

36. Division:
The division of administration of the department of which the Water Quality Control Division is a part.

37. Domestic wastewater:
See Wastewater, domestic.

38. Domestic Wastewater Treatment Works:
A system or facility for treating, neutralizing, stabilizing, or disposing of domestic wastewater which system or facility has a designed capacity to receive more than 2,000 gallons of domestic wastewater per day. The term "domestic wastewater treatment works" also includes appurtenances to such system or facility such as outfall sewers and pumping stations and equipment related to such appurtenances. The term "domestic wastewater treatment works" does not include industrial wastewater treatment plants or complexes whose primary function is the treatment of industrial wastes, notwithstanding the fact that human wastes generated incidentally to the industrial process are treated therein. 25-8-103 (5), C.R.S.

39. Dosing:
A high rate periodic discharge into a soil treatment area.

40. Dosing, demand:
A configuration in which a specific volume of effluent is delivered to a component based upon patterns of wastewater generation from the source.

41. Dosing, pressure:
A uniform application of wastewater throughout the intended portion of the soil treatment area through small diameter pipes and orifices, under pressure. For this definition, the term pressure indicates that the system is capable of creating upward movement of effluent out of the distribution system piping.

42. Dosing, timed:
A configuration in which a specific volume of effluent is delivered to a component based upon a prescribed interval, regardless of facility water use.

43. Dosing siphon:

A device used for demand dosing effluent, which stores a predetermined volume of water and discharges it at a rapid rate, from a tank at a given elevation to a component at a lower elevation, accomplished by means of atmospheric pressure and the suction created by the weight of the liquid in the conveying pipe.

44. Dosing tank:

A tank, compartment or basin that provides for storage of effluent from a septic tank or other treatment unit intended to be delivered to a soil treatment area at a high-rate periodic discharge.

45. Drainfield:

See Soil treatment area.

46. Drop box:

A device used for sequential distribution of effluent by gravity flow to a lateral of a soil treatment area.

47. Dry gulch:

See Gulch, dry.

48. Drywell:

An unlined or partially lined underground pit (regardless of geometry) into which drainage from roofs, basement floors, water softeners or other non-wastewater sources is discharged and from which the liquid seeps into the surrounding soil.

49. Effective Size:

The size of granular media such that 10 percent by weight of the media is finer than the size specified.

50. Effluent:

The liquid flowing out of a component or device of an On-site Wastewater Treatment System.

51. Effluent filter:

A removable, cleanable (or disposable) device installed on the outlet piping of a septic tank for the purpose of retaining solids larger than one-eighth inch and / or modulating effluent flow rate. An effluent filter may be a component of a pump installation. An effluent filter may also be installed following the septic tank before higher level treatment components or a soil treatment area.

52. Effluent pipe:

Non-perforated pipe that conveys effluent from one On-site Wastewater Treatment System component to the next.

53. Environmental health specialist:

A person trained in physical, biological, or sanitary science to carry out educational and inspectional duties in the field of environmental health.

54. Evapotranspiration/absorption system:

An unlined On-site Wastewater Treatment component that uses evaporation, transpiration, and absorption for dispersal of effluent.

55. Evapotranspiration system:

An On-site Wastewater Treatment component with a continuous, impermeable liner that uses evapotranspiration and transpiration for dispersal of effluent.

56. Failure:

A condition existing within any component of an OWTS which prevents the system from functioning as intended, and which results in the discharge of untreated or partially treated wastewater onto the ground surface or ground water, or which results in the back-up of sewage into the building sewer. Other conditions within an OWTS component that are deemed by the Fremont County Public Health Agency to be a threat to public health and/or safety may also be deemed a failure.

57. Field performance testing:

Data gathering on a system in actual use that is being proposed for Division acceptance.

58. Floodplain (100-year):

An area adjacent to a stream which is subject to flooding as the result of the occurrence of a one hundred (100) year flood, and is so adverse to past, current or foreseeable construction or land use as to constitute a significant hazard to public or environmental health and safety or to property or is designated by the Federal Emergency Management Agency (FEMA) or National Flood Insurance Program (NFIP). In the absence of FEMA/NFIP maps, a professional engineer must certify the flood plain elevations.

59. Floodway:

The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot or as designated by the Federal Emergency Management Agency or National Flood Insurance Program. In the absence of FEMA/NFIP maps, a professional engineer must certify the floodway elevation and location.

60. Flow, daily:

The measured volume of wastewater generated from a facility in a 24-hour period expressed as gallons per day.

61. Flow, design:

The estimated volume of wastewater per unit of time for which a component or system is designed. Design flow may be given in the estimated volume per unit such as person per unit time that must be

multiplied by the maximum number of units that a facility can accommodate over that time.

62. Flow equalization:
A system configuration that includes sufficient effluent storage capacity to allow for regulated flow on a daily or multi-day basis to a subsequent component despite variable flow from the source.

63. Flow equalizer:
An adjustment device to evenly distribute flow between outlets in a distribution box or other device that may be out of level.

64. Grease interceptor tank:
A watertight device located outside a facility designed to intercept, congeal, and retain or remove fats, oils, and grease from sources such as commercial food service that will generate high levels of fats, oils and greases.

65. Ground water:
That part of the subsurface water that is at or below the saturated zone.

66. Groundwater Condition:
A condition in the soil where a seasonal or current groundwater surface has been identified, thus creating a vertical separation requirement to the infiltrative surface of a soil treatment surface.

67. **Ground water surface:**
The uppermost limit of an unconfined aquifer at atmospheric pressure.

68. Guidelines:
State Board of Health Guidelines on Individual Sewage Disposal Systems, 5 CCR 1003-6 – predecessor of Regulation 43, On-site Wastewater Treatment System Regulation, 5 CCR 1002-43.

69. Gulch, dry:
A deep, narrow ravine that receives discontinuous storm influenced flows for a short duration in direct response to a rain event and is not interconnected to a groundwater source.

70. Health officer:
The chief administrative and executive officer of the Fremont County Public Health Agency, or the appointed health officer of the Fremont County Board of Health. Health officer includes the director of the Fremont County Public Health Agency.

71. Higher level treatment:
Designated treatment levels other than treatment level 1.

72. Holding Tank:
See Vault.

73. Individual Sewage Disposal System:
A term used for On-site Wastewater Treatment System in Colorado regulations from 1973 until 2013.

74. Infiltrative surface:

Designated interface where effluent moves from distribution media or a distribution product into treatment media or original soil. In a standard trench or bed system this will be the interface of the distribution media or product and in-situ soil. Two separate infiltrative surfaces will exist in a mound system and an unlined sand filter, one at the interface of the distribution media and fill sand, the other at the interface of the fill sand and in-situ soil.

75. Inspection port:

An access point in a system component that enables inspection, operation and/or maintenance.

76. Invert:

Elevation of the bottom of the inside pipe wall or fitting.

77. Lateral:

A pipe, chamber or other component used to transport and distribute effluent.

78. Leach field:

See Soil treatment area.

79. Limiting layer:

A horizon or condition in the soil profile ~~or underlying strata that limits the treatment~~ that exhibits a limited capacity for treatment but will readily accept the effluent. Generally speaking, this includes fractured bedrock, and type R-0 soils (see Table 10-1A).

80. Liner:

An impermeable synthetic or natural material used to prevent or restrict infiltration and/or exfiltration. For the purpose of this regulation, the minimum thickness of a liner must be 30 mil.

81. Linear loading rate:

The amount of effluent applied per linear foot along the contour (gpd/linear ft.).

82. Local board of health:

Any local, county, or district board of health.

83. Local health department:

See local public health agency.

84. Local public health agency:

Any county, district, or municipal public health agency and may include a county, district, or municipal board of health to oversee On-site Wastewater Treatment System permitting and inspection or an on-site wastewater treatment system program. A local public health agency may designate another agency to administer the OWTS program.

85. Long-term acceptance rate: (LTAR)

Design parameter expressing the rate that effluent enters the infiltrative surface of the soil treatment area at equilibrium, measured in volume per area per time, e.g. gallons per square foot per day (gal/ ft^2/day).

86. Malfunction:

The condition in which a component is not performing as designed or installed and is in need of repair or modification in order to function as originally intended.

87. Manufactured media:

See Media, other manufactured.

88. Media:

Solid material that can be described by shape, dimensions, surface area, void space, and application.

89. Media, enhanced manufactured:

An accepted proprietary manufactured distribution product that includes synthetic media contained within one or more external permeable outer layers which promote the movement of the effluent, and is placed on a specified sand base or media that does not mask the infiltrative surface of the in-situ soil.

90. Media, other manufactured:

An accepted proprietary manufactured distribution product made of synthetic media for distribution of effluent that is placed directly on the in-situ soil.

91. Media, treatment:

Non- or slowly-degradable media used for physical, chemical, and/or biological treatment in an On-site Wastewater Treatment System component.

92. Mound:

A soil treatment area whereby the infiltrative surface is at or above original grade at any point.

93. Nitrogen reduction:

A minimum 50 percent reduction of influent nitrogen strength which is the minimum objective of NSF/ANSI Standard 245 - Wastewater Treatment Systems - Nitrogen Reduction. (2023 version)

94. On-Site Wastewater Treatment System: or (OWTS)

Where the context so indicates, the term "system" means an absorption system of any size or flow or a system or facility for treating, neutralizing, stabilizing, or dispersing sewage generated in the vicinity, which system is not a part of or connected to a sewage treatment works.

95. OWTS Act:

The On-site Wastewater Treatment System Act, 25-10-101, et seq. C.R.S.

96. Percolation test:

A subsurface soil test at the depth of a proposed absorption system or similar component of an OWTS to determine the water absorption capability of the soil, the results of which are normally expressed as the rate at which one inch of water is absorbed. The rate is expressed in minutes per inch.

97. Performance standard:

Minimum performance criteria for water quality and operation and maintenance established by the regulatory authority to ensure compliance with the public health and environmental goals of the state or public health agency.

98. Permeability:

The property of a material which permits movement of water through the material.

99. Permit:

A permit for the construction or alteration, installation, and use or for the repair of an On-site Wastewater Treatment System.

100. Person:

An individual, partnership, firm, corporation, association, or other legal entity and also the state, any political subdivision thereof, or other governmental entity.

101. Pressure distribution:

See Dosing, pressure

102. Privy:

An above grade structure allowing for the disposal of excreta not transported by a sewer and which provides privacy and shelter and prevents access to the excreta by flies, rodents, or other vectors.

1. Pit privy – privy over an unlined excavation. (OUT HOUSES)
   The Fremont County Board of Health has elected to prohibit any new installation of Pit Privies.
   The Fremont County Board of Health has elected to prohibit the continued use of existing pit privies.
2. Vault privy – privy over a vault.

103. Professional engineer:

An engineer licensed in Colorado, in accordance with section 12-120-201, et. Seq., C.R.S. and practicing within their areas of expertise, consistent with 4 CCR 730-1.

104. Professional geologist:

A person who is a graduate of an institution of higher education which is accredited by a regional or national accrediting agency, with a minimum of thirty semester (forty-five quarter) hours of undergraduate or graduate work in a field of geology and whose post-baccalaureate training has been

in the field of geology with a specific record of an additional five years of geological experience to include no more than two years of graduate work. 23-41-208, C.R.S.

105. Proprietary product:
A manufactured component or other product that is produced by a private person. It may be protected by patent, trademark or copyright.

106. Public domain technology:
A system that is assembled on location from readily available components and is based on well-established design criteria and is not protected by patent, trademark or copyright.

107. Record drawing:
Construction drawings provided to illustrate the progress or completion of the installation of an OWTS; typically based on field inspections by the designer or local public health agency.

108. Redoximorphic:
A soil property that results from the reduction and oxidation of iron and manganese compounds in the soil after saturation with water and subsequent desaturation.

109. Remediation system:
A treatment system, chemical/biological additive or physical process that is proposed to restore the soil treatment area of an OWTS to intended performance.

110. Repair:
Restoration of functionality and/or treatment by reconstruction, relocation, or replacement of an On-site Wastewater Treatment System or any component thereof in order to allow the system to function as intended.

111. Replacement system:
See Repair.

112. Riser:
A watertight vertical cylinder and lid allowing access to an OWTS component for inspection, cleaning, maintenance, or sampling.

113. Restrictive layer:
A condition in the soil profile that restricts the vertical movement of the effluent. This may include impervious bedrock, glacial till, platy soils, or soils with a cementation class of "strongly cemented" or greater.

114. Rock-plant filter:
A designed system which utilizes treatment media and various wetland plants to provide treatment of wastewater through biological, physical, and chemical processes. Also called a constructed wetland.

115. Sand filter:

An engineer designed OWTS that utilizes a layer of specified sand as filter and treatment media and incorporates pressure distribution.

116. Sand filter, lined:

An engineer designed OWTS that has an impervious liner and under-drain below the specified sand media. Lined sand filters may be intermittent / single pass where the effluent is distributed over the sand bed a single time before distribution to a soil treatment area, or recirculating where part of the effluent is returned to an earlier component for additional treatment before distribution to a soil treatment area.

117. Sand filter, unlined:

An engineer designed OWTS that includes a layer of specified sand used as a treatment media without a liner between the sand and the existing soil on which it is placed.

118. Seepage pit:

An excavation deeper than it is wide that receives septic tank effluent and from which the effluent seeps from a structural internal void into the surrounding soil through the bottom and openings in the side of the pit.

119. Septage:

A liquid or semisolid that includes normal household wastes, human excreta, and animal or vegetable matter in suspension or solution generated from a residential septic tank system. Septage may include such material issued from a commercial establishment if the commercial establishment can demonstrate to the Division that the material meets the definition for septage set forth in this subsection. Septage does not include chemical toilet residuals.

120. Septic tank:

A watertight, accessible, covered receptacle designed and constructed to receive sewage from a building sewer, settle solids from the liquid, digest organic matter, store digested solids through a period of retention, and allow the clarified liquids to discharge to other treatment units for final disposal.

121. Sequential distribution:

A distribution method in which effluent is loaded into one trench and fills it to a predetermined level before overflowing to the succeeding trench through a drop box. Effluent does not pass through the distribution media before it enters any succeeding trenches. The effluent is dispersed through a drop box at the proximal end of the system, allowing for portions of the absorption area to be isolated.

122. Serial distribution:

A distribution method in which effluent is loaded into one trench and fills it to a predetermined level before passing through a relief pipe or device to the succeeding trench. The effluent passes through the distribution media before entering succeeding trenches which may be connected to provide a single uninterrupted flow path.

123. Sewage:

A combination of liquid wastes that may include chemicals, house wastes, human excreta, animal or vegetable matter in suspension or solution, and other solids in suspension or solution, and that is discharged from a dwelling, building, or other establishment. See also Wastewater.

124. Sewage treatment works:

Has the same meaning as "domestic wastewater treatment works" under section 25-8-103, C.R.S.

125. Site evaluation:

A comprehensive analysis of soil and site conditions for an OWTS.

126. Site evaluator:

A practitioner who conducts preconstruction site evaluations, including visiting a site and performing soil analysis, a site survey, or other activities necessary to determine the suitability of a site for an OWTS.

127. Slit trench latrine:

A temporary shallow trench for use as disposal of non-water-carried human waste.

The FREMONT COUNTY BOARD OF HEALTH has elected to prohibit the construction of or use of any Silt Trench Latrine.

128. Soil:

1. Unconsolidated mineral and/or organic material on the immediate surface of the earth that serves as a medium for the growth of plants and can potentially treat wastewater effluent;

2. Unconsolidated mineral or organic matter on the surface of the earth that has been subjected to and shows effects of:

   a. Pedogenic and environmental factors of climate (including water and temperature effects)
   b. Macro and microorganisms, conditioned by relief, acting on parent material over a period of time.

129. Soil evaluation:

A percolation test, soil profile, or other subsurface soil analysis at the depth of a proposed soil treatment area or similar component or system to determine the water absorption capability of the soil, the results of which are normally expressed as the rate at which one inch of water is absorbed or as an application rate of gallons per square foot per day.

130. Soil horizon:

Layers in the soil column differentiated by changes in texture, color, redoximorphic features, bedrock, structure, consistence, and any other characteristic that affects water movement or treatment of effluent.

131. Soil morphology:

1. Physical constitution of a soil profile as exhibited by the kinds, thickness, and arrangement of the horizons in the profile; and by the texture, structure, consistence, and porosity of each horizon;
2. And visible characteristics of the soil or any of its parts.

132. Soil profile test pit excavation:

A trench or other excavation used for access to evaluate the soil horizons for properties influencing effluent movement, bedrock, evidence of seasonal high ground water, and other information to be used in locating and designing an On-site Wastewater Treatment System.

133. Soil structure:

The naturally occurring combination or arrangement of primary soil particles into secondary units or peds; secondary units are characterized on the basis of type, size class, and grade (degree of distinctness).

134. Soil texture:

Proportion by weight of sand, silt, and clay in a soil.

135. Soil treatment area:

The physical location where final treatment and dispersal of effluent occurs. Soil treatment area includes drain fields, mounds and drip fields.

136. Soil treatment area, alternating:

Final treatment and distribution component that is composed of two soil treatment areas that are independently dosed.

137. Soil treatment area, sequencing:

A soil treatment area having more than two sections that are dosed on a frequent rotating basis.

138. State Waters:

The meaning set forth under section 25-8-103. C.R.S.

139. Strength, wastewater:

The concentration of constituents of wastewater or effluent; usually expressed in mg/L.

140. Suitable soil:

A soil which will effectively treat and filter effluent by removal of organisms and suspended solids, which meets long-term acceptance rate requirements as defined in Table 10-1, and has the required vertical thickness below the infiltrative surface and above a limiting layer.

141. Systems cleaner:

A person engaged in and who holds themselves out as a specialist in the cleaning and pumping of On-site Wastewater Treatment Systems and removal of the residues deposited in the operation thereof.

142. Systems contractor:

A person engaged in and who holds themselves out as a specialist in the installation, renovation, and repair of On-site Wastewater Treatment Systems.

143. System maintenance provider:

A person engaged in and who holds themselves out as a specialist in routine or periodic actions taken to assure that the On-site Wastewater Treatment System is functioning as intended, and / or that the On-site Wastewater Treatment System is meeting performance requirements.

144. Tiny Home:

A structure (a non-recreational vehicle) that has only one bedroom and has 400 sq. ft. or less livable space, including lofts. In this instance, the OWTS may be sized for only one bedroom.

145. Total suspended solids:

Measure of all suspended solids in a liquid; typically expressed in mg/L.

146. Transfer of Title:

Change of ownership of a property.

147. Transfer of Title Inspector:

A person engaged in and who holds themselves out as a specialist in conducting evaluations and observations of an existing On-site Wastewater Treatment System serving a structure that is proposed for property transfer, to assess if the system is functioning as intended.

148. Treatment level:

Defined concentrations of pollutants to be achieved by a component or series of components of an OWTS.

149. Treatment media:

See Media, treatment

150. Treatment unit:

A component or series of components where solids or pollutants are removed from wastewater or effluent from a preceding component.

151. Trench:

1. Below-grade soil treatment area consisting of a shallow excavation with a width of 3 feet or less containing distribution media and one lateral.
2. Excavation for placement of piping or installation of electrical wire or conduit.

152. Uniformity coefficient:

A value which is the ratio of D60 to D10 where D60 is the soil diameter of which 60 percent of the soil weight is finer and D10 is the corresponding value at 10 percent finer. (A soil having a uniformity coefficient smaller than 4 would be considered "uniform" for purposes of this regulation.)

153. Vault:

A watertight, covered receptacle, which is designed to receive and store excreta or wastes either from a building sewer or from a privy and is accessible for the periodic removal of its contents. If the vault is intended to serve a structure or structures that are projected to generate a domestic wastewater flow of greater than two thousand gallons per day at full occupancy, the vault would be considered a domestic wastewater treatment works. Vaults are On-site Wastewater Treatment Systems.

154 Visual and tactile evaluation of soil:

Determining the properties of soil by standardized tests of appearance and manipulation in the hand.

155. Volume, effective:

The amount of effluent contained in a tank under normal operating conditions; for a septic tank, effective volume is determined relative to the invert of the outlet. For a dosing tank, the effective volume under normal conditions is determined relative to the invert of the inlet and the control off level.

156. Wastewater, domestic

Combination of liquid wastes (sewage) which may include chemicals, household wastes, human excreta, animal or vegetable matter in suspension or solution, or other solids in suspension or solution which are discharged from a dwelling, building or other structure.

157. Wastewater, high strength:

1. Wastewater form a structure having BOD_5 greater than 300 mg/L; and/or TSS greater than 200 mg/L; and/or fats, oils, and grease greater than 50 mg/L.
2. Effluent from a septic tank or other pretreatment component (as defined by NSF/ANSI Standard 40)that has BOD_5 greater than 180 mg/L; and/or TSS greater than 80 mg/L; and/or fats, oils, and grease greater than 25 mg/L and is applied to an infiltrative surface.

158. Wastewater pond:

A designed pond which receives exclusively domestic wastewater from a septic tank, and which provides an additional degree of treatment.

159. Watercourse:

A natural or artificial channel through which water flows, either continuously or intermittently, and exhibits a connection to an actual or

elevated groundwater table. A watercourse includes the bed of a channel that flows only seasonally (e.g., creek, stream irrigation ditch). Hollows, ravines, or roadside ditches that are normally dry are not considered a watercourse.

160. Water Quality Control Commission:
See Commission.

161. Water Quality Control Division:
See Division.

162. Wetland, constructed:
See Rock-plant filter.

163. Wetlands:
Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.

Table 3-1 Abbreviations and Acronyms

AASHTO	American Association of State Highway and Transportation Officials
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
C.R.S.	Colorado Revised Statutes
CBOD	Carbonaceous Biochemical Oxygen Demand
CSA	Canadian Standards Association
gpd	gallons per day
IAPMO	International Association of Plumbing and Mechanical Officials
ISDS	Individual Sewage Disposal System
LTAR	Long-term Acceptance Rate

mg/L	milligrams per Liter
MPI	Minutes Per Inch
NAWT	National Association of Wastewater Technicians
NDDS	Non-pressurized Drip Dispersal System
NPCA	National Precast Concrete Association
NSF	NSF International
OWTS	On-site Wastewater Treatment System(s)
STA	Soil Treatment Area
TL	Treatment Level
TN	Total Nitrogen
TSS	Total Suspended Solids
UL	Underwriters' Laboratories

4. Applicability

A. Regulations Adopted by the Fremont County Board of Health

1. Regulation Coverage
   a. An OWTS with design capacity less than or equal to 2,000 gpd must comply with regulations adopted by the Fremont County board of health pursuant to this regulation and the OWTS Act. Within the jurisdiction of the Fremont County Public Health Agency, the regulations promulgated by the Fremont County Board of Health govern all aspects of OWTS permits, performance, location, construction, alteration, installation, and use.
   b. An OWTS with design capacity greater than 2,000 gpd must comply with this regulation, site location and design approval in section 25-8-702, C.R.S., and the discharge permit requirements in the Water Quality Control Act, 25-8-501, et seq. C.R.S.
      (1) Applicable Commission regulations include, but are not limited to, the following:

(i) Regulation 22 - Site Location and Design Approval Regulations for Domestic Wastewater Treatment Works (5 CCR 1002-22); and associated policies.

(ii) Regulation 41 - The Basic Standards for Ground Water (5 CCR 1002-41).

(iii) Regulation 42 - Site-Specific Water Quality Classifications and Standards for Ground Water (5 CCR 1002-42).

(iv) Regulation 61 - Colorado Discharge Permit System Regulations (5 CCR 1002-61).

(v) Regulation 62 - Regulations for Effluent Limitations (5 CCR 1002-62).

(2) For systems greater than 2,000 gpd, the Division is also authorized to determine those parts of this regulation identified as the prerogative of the Fremont County Public Health Agencies.

(3) The requirements for maintenance and standards of performance for systems greater than 2,000 gpd shall be determined by the site application approval and discharge permit.

(4) In the interest of facilitating communication of the Fremont County Public Health Agency concerns regarding a design being reviewed by the Division, the Fremont County Public Health Agency can provide comments to the Division for consideration during the Division's review of the proposed design and discharge permit application. Under such a coordinated process, the Division retains final authority for approval or denial of each domestic wastewater treatment works that is regulated under the site location approval and Colorado Discharge Permit System regulations. Prior to approval or denial of each OWTS domestic wastewater treatment works, the Division must acknowledge and consider local OWTS regulations when they are more stringent and restrictive than this regulation.

B. Permit Application Requirements and Procedures

1. Prior to installing, altering, or repairing a system, the applicant must obtain a permit from the Fremont County Public Health Agency.
2. An applicant must submit a complete application that is consistent with section IV.B.3 to the Fremont County Public Health Agency prior to installing, altering or repairing a system.

3. Minimum Permit Application Requirements:
    a. Owner name and contact information;
    b. Property address;
    c. Property legal description;
    d. Type of permit;
    e. Report from Site and Soil Evaluation (section 5);
    f. System design with a legible, accurate site plan which shows pertinent physical features on subject property, and on adjacent properties, as noted in Table 7-1; and
    g. Other information, data, plans, specifications and tests as required by the Fremont County Public Health Agency.
        (1) When specific evidence suggests undesirable soil conditions exist, additional hydrological, geological, engineering or other information provided by a professional engineer or geologist may be required to be submitted by the applicant. This requirement will not prejudice the right of the Fremont County Public Health Agency to develop its own information from its own source at its own expense.
4. Permit Fees
    a. The Fremont County Board of Health may set fees for permits. The permit fees may be no greater than required to offset the actual indirect and direct costs of the Fremont County Public Health Agency. 25-10-107, C.R.S.
    b. Permit application fees must be submitted by an applicant with the permit application, and are due and payable upon receipt of the permit application.
    c. The Fremont County Board of Health may make provision for the waiver of any permit fee normally required for an OWTS.
5. Other Fees
    a. The Fremont County Board of Health may set fees for inspections, soil evaluation, and other services performed by the Fremont County Public Health Agency. The fees must be no greater than required to offset the actual indirect and direct costs of the services, and must not exceed the maximum amounts specified in section 25-10-107, C.R.S.
    b. Surcharge - The Fremont County Public Health Agency must collect a fee for each permit issued for a new, repaired, or upgraded OWTS. and transmit funds to the Colorado Department of Public Health and Environment for use in funding the state's OWTS program, as identified in the On-site Wastewater Treatment System Act 25-10-

107 (3) C.R.S. until replaced by a fee (s) becoming effective in Regulation 102 adopted under Section 25-8-210 (1) (a) (X) C.R.S.

6. Permit Term
   a. An OWTS permit expires one year after the date of issuance if construction has not commenced or as specified by the Fremont County Board of Health regulations.
   b. Any change in plans or specifications of the OWTS after the permit has been issued invalidates the permit unless the permittee receives written approval from the Fremont County Public Health Agency for such changes.
7. Renewal
   a. The Fremont County Health Department is authorized to grant the renewal of any permit for an additional year provided the request comes from the permit holder along with the required fee no greater than required to offset the actual indirect and direct costs of the services.
8. Repair Permit
   a. The owner or occupant of a property on which an OWTS is not in compliance must obtain a repair permit from the Fremont County Public Health Agency. The applicant must apply for a repair permit within two business days after receiving notice from the Fremont County public Health Agency that the system is not functioning in compliance with the OWTS Act or applicable regulations, or otherwise constitutes a nuisance or a hazard to public health or water quality.
   b. The repair permit must provide for a reasonable period of time within which the owner or occupant must make repairs. At the end of that period, the Fremont County Public Health Agency must inspect the system to ensure it is functioning properly. Concurrently with the issuance of a repair permit, the Fremont County Public Health Agency may issue an emergency use permit authorizing continued use of a malfunctioning system on an emergency basis for a period not to exceed the period stated in the repair permit. Such an emergency use permit may be extended, for good cause shown, in the event repairs may not be completed in the period stated in the repair permit through no fault of the owner or occupant and only if the owner or occupant will continue to make repairs to the system.
9. A permit must be required for a change of use, or the expanded use of an OWTS where it has been determined that the existing OWTS is not sized to accommodate the expected additional hydraulic or organic load. The OWTS must be replaced or modified to handle such an increase unless it is

determined that the existing system is adequately designed and constructed.

10. Regulations of the Fremont County Board of Health must include provisions that provide for review by the Fremont County Board of Health of applications denied by the Fremont County Public Health Agency when requested by an applicant.
11. The issuance of a permit and specifications of terms and conditions therein will not constitute assumption of liability, nor create a presumption that the Fremont County Public Health Agency or its employees may be liable for the failure or malfunctioning of any system. Permit issuance will not constitute a certification that the system, the equipment used in the system, or any component used for system operation will ensure continuous compliance with the provision of the OWTS Act, the regulations adopted thereunder, or any terms and conditions of a permit.
12. No OWTS permit shall be issued to any person when the subject property is located within a municipality or special district that provides public sewer service, except where such sewer service to the property is not feasible in the determination of the municipality or special district, or the permit is otherwise authorized by the municipality or special district.
13. Permits to construct, repair, extend or replace an OWTS will be denied within a municipal or sanitation district and when sewer lines exist within 400 feet of the applicant's property. In the event that the location to be served shall not be within a municipal or sanitation district but sewer lines do exist within 400 feet of the applicant's property or place of use, then and in that event , as a condition of approval of an OWTS , the applicant must show that the applicant has made application to attached to such sewer service and to join the sanitation district operating such sewers, together with proof that the petition of the applicant has been denied and that the district is unable to provide service for the applicant's use.

    (Sewer line shall mean any sewer line, interceptor line or other appurtenance that the municipal or sanitation district will allow connection to).
14. Permits to construct, repair, extend or replace an OWTS will be referred to the City of Cañon City for review and comment, if the property is located within the source water protection area. (Reference the Source Water Protection Plan for City of Cañon City CO0122100)

C. Determination

1. The Fremont County Public Health Agency must determine whether the information provided in the permit application, site and soil evaluations, assumptions and calculations, and design of the proposed OWTS are in compliance with the requirements of the OWTS Act and regulations

adopted pursuant thereto. If the submittal is determined to be in compliance, authorization to begin installation may be given.

D. Access to Site

1. For the purpose of inspecting and enforcing applicable regulations and the terms and conditions of any permit issued and investigating and responding to complaints, the Fremont County Public Health Agency is authorized to enter upon private property at reasonable times and upon reasonable notice for the purpose of determining whether or not an operating OWTS is functioning in compliance with the OWTS Act and applicable regulations adopted pursuant thereto and the terms and conditions of any permit issued and to inspect and conduct tests in evaluating any permit application. The owner or occupant of every property having an OWTS must permit the Fremont County Public Health Agency access to the property to make inspections, conduct required tests, take samples, and monitor compliance.

E. Inspection Stages

1. Fremont County regulations must specify the stages of site evaluation, construction, installation, alteration, or repair at which the Fremont County Public Health Agency must require inspections.
2. Before a system is placed in use, the owner, the owner's agent or the systems contractor must provide the Fremont County Public Health Agency and the engineer, if engineer-designed, with notice that the progress of the work has been sufficiently completed to allow inspections to determine if all work has been performed in accordance with the permit requirements and to determine compliance of the system with the OWTS Act and the regulations adopted thereunder.

F. Final approval of the permit by the Fremont County Public Health Agency must include, but is not limited to:

1. Receipt of letter from the engineer certifying construction of the OWTS as per the approved design plan, if the OWTS was engineer designed. This letter must include any modifications to the permitted and approved design, general observations noted during the inspection (s), and the corresponding dates of all inspections.

   a. For designs that include a pressurized distribution system, a residual head test (squirt height), at the distal end of each lateral, must be conducted to determine the adequacy of system design and construction. Results from this inspection must be included within both the engineer's certification and the final permit acceptance documents.
2. Receipt of a record drawing which includes a scale drawing showing all components of the OWTS including their location from known and findable points, dimensions, depths, sizes, manufacture's names and models as

available, and other information related to locating and maintaining the OWTS components.

3. Final inspection prior to backfilling the OWTS by the Fremont County Public Health Agency confirming that it was installed according to the permit requirements and regulations or variances to the regulations.
4. Identification of system contractor.

G. Division Authority to Administer and Enforce

1. Wherever the term Fremont County Board of Health or Fremont County Public Health Agency is used in this regulation, said terms must also include the Division under its designated authority for the purposes of administering and enforcing the provisions of this regulation where necessary to protect the public health and environment.

H. Primary Enforcement Responsibility:

1. The primary responsibility for enforcement of the provisions of the OWTS Act and the regulations adopted under said article will lie with the Fremont County Board of Health.
2. In the event that the Fremont County Board of Health fails to administer and enforce the provisions of said section, and the regulations adopted under the OWTS Act, the Division may assume such functions of the Fremont County Public Health Agency or Fremont County Board of Health as may be necessary to protect the public health and environment. (25-10-110, C.R.S.)

I. Product Development Permit:

1. For Products that have not received Division acceptance under section XIII.D, the manufacturer may apply to the local public health agency for a product development permit, Requirements for proprietary treatment product acceptance are located in 13.D of this regulation.
2. For products or types of systems which have not been otherwise accepted by the Division pursuant to section 13.D, the Fremont County Board of Health may approve an application for product development permit only if the system has been designed by a professional engineer, and only if the applicant meets all requirements of section 4.I, items 3 through 11.
3. Before a product development permit is issued by the Fremont County Public Health Agency, the Division must determine that the product to be tested qualifies for testing under the product development evaluation based on information submitted to the Division.
    a. Applicant must provide evidence of nationally accepted third-party testing of the product to be evaluated, or;
    b. Provide test data from multiple single-family homes under normal working conditions that meet the following criteria:
        (1) Test data must be provided from a minimum of four sites.

(2) Each system must be tested over a period of at least one year.
(3) Each system must be sampled at least three times during the year with at least one sample obtained during cold weather conditions.
(4) Laboratory results for all parameters for which acceptance is being requested must be submitted.

4. The Fremont County Board of Health must not arbitrarily deny any person the right to consider an application for such a system and must apply reasonable performance standards in determining whether to approve such an application; 25-10-108 (2), C.R.S.
5. A completed application for a product development permit must be submitted to the Fremont County Public Health Agency at least 30 days in advance of installation of the product.
6. An application for a product development permit must include the following:
   a. Proof of the ability to install a replacement OWTS in compliance with all Fremont County requirements in a timely manner in the event of a failure or malfunction of the system under testing;
   b. A description of the product under development including performance goals;
   c. Documentation signed by the owner of the proposed product development site allowing access to the Fremont County Public Health Agency and Division for inspection of the site; and
   d. Design documents as required in section 5.G of this regulation
7. Other than the performance standards identified in section 4.I (3) above. The Fremont County Public Health Agency may stipulate additional requirements for the product development permit necessary to ensure that the system performs as intended.
8. A product development permit is a site-specific permit. Product development testing at multiple sites requires a product development permit for each site.
9. During the term of the product development permit, all data collected is to be submitted to the Division and the Fremont County Public Health Agency.
10. The Fremont County Public Health Agency may revoke or amend a product development permit, if the continued operation or presence of the product under development:
    a. Presents a risk to the public health or environment.
    b. Causes adverse effects on the proper function of the OWTS on the site.
    c. Leaks or discharges effluent on the surface of the ground; or

d. If the developer of the product fails to comply with any requirements stipulated on the permit by the Fremont County Public Health Agency or the Division.

11. If the product development permit is revoked, the product developer must install the replacement system within the time frame established by the Fremont County Public Health Agency.

12. Once the system is installed and approved, the Fremont County Health Agency must supply the Division with a copy of the completed OWTS permit.

J. Prohibition of OWTS in Unsuitable Areas:

1. The Fremont County Board of Health may prohibit issuance of OWTS permits in accordance with applicable land use laws and procedures for defined areas in which the Fremont County Board of Health determines that construction and use of additional OWTS may constitute a hazard to public health or water quality.

K. Licensing of Systems Contractors and Systems Cleaners

1. The Fremont County Board of Health has adopted regulations which provide for the licensing of systems contractors and system cleaners.
   a. The Fremont County Public Health Agency may charge a fee, not to exceed actual cost, for the initial license and for a renewal of the license. The Initial licensing and renewals thereof must be for a period of not less than one year. Prior to the issuance or renewal of a license, the Fremont County Public Health Agency shall require the applicant to demonstrate adequate knowledge of these regulations at no greater than 3-year intervals.

2. The Fremont County Board of Health may revoke or suspend the license for violation of the applicable provisions of the OWTS Act and the implementing regulations or for other good cause shown, after a hearing conducted upon reasonable notice to the licensee and at which the licensee may be present, with counsel, and be heard. Grounds for revocation or suspension of a contractor license or OWTS permit are specified in the following sections. (4.K.2.a through 4.K.2.f)
   a. **Letter of Reprimand.** As used in this section, a letter of reprimand is an admonishment issued to a licensed contractor by the Fremont County Health Department. Minor violations shall result in an official letter of reprimand to be placed in the contractor's permanent file of records. Letters of reprimand are not intended for standard corrections resulting from an inspection. Violations which may result in a letter of reprimand shall include, but may not be limited to, the following:
      1) Failure to request a required inspection;

2) Failure to renew an expired permit;
3) Performing work that is beyond the scope of the permit;
4) Verified complaint of abandonment of a project;

b. **Critical Violations.** Critical violations, which may result in immediate suspension of a contractor's license, shall include, but may not be limited to, the following:
1) Performing any work which requires an OWTS permit without first obtaining such permit.
2) A contractor who uses their license to obtain a permit for work they will not be supervising or performing.
3) Willfully providing false or misleading information on a permit application;
4) Conviction of a contractor, by a court having competent jurisdiction, for a civil or criminal fraud related to construction activity regulated by this code.
5) Accumulation of three (3) letters of reprimand in a twelve (12) month period.

c. **Suspension of License.** Any contractor's license issued by the Fremont County Health Department shall be subject to suspension for repeated violations of any Federal, State or County laws, rules, codes or resolutions. Critical violations may result in immediate suspension by the Fremont County Health Department. A critical violation is any violation specifically listed in section 4.K.2.b or any other act which causes or has potential to cause harm or damage to any person or any person's property. Suspension of a license shall remain in effect until the violation (s) is (are) corrected to the satisfaction of the Health Officer but not to exceed ninety (90) calendar days. Work being performed under any active OWTS permit, issued to the licensee whose license has been suspended, shall cease and desist until the license in reinstated or the permit is transferred to another contractor. Permit transfer may only be initiated by written consent of the owner of the subject property.

d. **Appeal of Suspension.** Any license suspension issued by the Fremont County Health Department may be appealed to the Fremont County Board of Health pursuant to the Departments appeal process. The decision of the Board of Health shall constitute final action, subject to judicial review at the option of the licensee.

e. **Revocation.** Any contractor's license issued by the Fremont County Health Department shall be subject to revocation. Upon issuance of a third suspension of a license, the Fremont County Department of Health is authorized to summon the licensee to a hearing before the

Board of Health. As a result of that hearing, the Board of Health shall vote on the outcome and may decide to grant reinstatement of the license, grant an extension of the suspension period or order revocation of the license. Final decision shall be made by majority vote of the Board. Revocation shall remain in effect for a period of one (1) calendar year. Work being performed under any active OWTS permit, issued to the licensee whose license has been revoked, shall cease and desist until the license in reinstated or the permit is transferred to another contractor. Permit transfer may only be initiated by written consent of the owner of the subject property.

f. **Reinstatement.** Any contractor wanting to reinstate their license after the one year revocation, must reapply for a new license. The Fremont County Department of Health shall review the applicants file to ensure all violations or revocation contingencies have been satisfied prior to the issuance of a new license.

3. A Systems Cleaner license holder shall maintain his/her equipment to ensure that no spillage of sewage will occur during transportation, and that his/her employees are not subjected to undue health hazards. Hauling shall be accomplished by the use of an enclosed tank. A license holder shall dispose of the sewage only at a municipal sewage treatment plant or other sites approved by the Fremont County Board of Health, and shall comply with all other applicable local codes and regulations.

L. Transfer of Title Inspections:

1. The Fremont County Board of Health does not have a Transfer of Title Inspection Program, therefore, an inspection is not required.

M. Permit for the continued use of an OWTS:

1. The Fremont County Board of Health does not have a Permit Program authorizing the continued use of am OWTS; therefore, a continued use Permit is not required.

N. Variance Procedure:

1. **General:**

a. The purpose of this section is to provide a procedure for the Fremont County Public Health Agency to consider variances from the design and/or siting requirements of the OWTS regulations.

b. The Fremont County Board of Health may set fees for processing an OWTS permit with a variance in accordance with section 25-10-107, C.R.S. This permit fee may be the standard OWTS permit fee or may be a separate fee based upon the cost of processing a permit with a variance.

2. **Requirements for Variance Consideration:**

a. The Fremont County Board of Health shall hear all variance requests.

b. The Fremont County Board of Health may require a public hearing with respect to any requested variances. Applications for variance that may require a public hearing include, but are not limited to those that, if approved, likely will have a significant impact on neighboring properties, public or private utility providers, surface or ground water, and public health. Prior to the rendering a decision on a variance request requiring a public hearing, a public hearing must be held. The hearing must be the subject of a public notice or notice must be sent via certified mail, with a minimum 20-day reply time from the date of mailing to all adjacent property owners.

c. Variance requests must be accompanied by:

(1) Site-specific request identifying the specific criteria from which a variance is being requested;

(2) Technical justification by a professional engineer or professional geologist, which indicates the specific conditions which exist and/or the measures which will be taken that support a finding that the variance will result in no greater risk than that associated with compliance with the requirements of the regulation. Examples of conditions which exist, or measures which might be taken, include but are not limited to the following: evidence of a natural or manmade physical barrier to the movement of effluent to or toward the feature from which the variance is requested; placement of a manmade physical barrier to the movement of effluent to or toward the feature from which the variance is requested; soil replacement with sand filter media to reduce the infiltration rate of the effluent such that the travel time of the effluent from the absorption field to the physical feature is no less than the travel time through the native soils at the prescribed setback and Higher Level Treatment;

(3) A discussion of alternatives considered in lieu of the requested variance;

(4) Technical documentation for selected alternative, which may include a testing program, which confirms that the variance does not increase the risk to public health and to the environment; and

(5) A statement of the hardship that creates the necessity for the variance.

d. The applicant has the burden of proof to demonstrate that the variance is justified and will pose no greater risk to public health and the environment than would a system meeting the regulations.

3. **Conditions of Variance:**

The Fremont County Board of Health has the authority to impose site-specific requirements and conditions on any variance granted.

4. **Outcome of the Variance Proceeding:**

a. The applicant must be notified, in writing, of the Fremont County Board of Health's decision regarding the request for a variance. The notice of a denial of a variance must include those reasons which form the basis for the denial. The notice of an approval of a variance must include any conditions of the approval. The variance, and any conditions thereof, must be noted as a restriction on the deed to the property and recorded in the real estate records in the Fremont County Clerk and Recorder's office, any expenses associated with that recording must be the responsibility of the party obtaining the variance.

5. **Prohibitions on the Granting of Variance Requests:**

a. No variance shall be issued where the property can accommodate a conforming OWTS.

b. No variance shall be issued to mitigate an error in construction involving any element of property improvements.

c. No variance shall be allowed solely for economic gain.

d. No variance shall be issued, if it will result in a setback reduction to an offsite physical feature that does not conform to the minimum setbacks defined in Table 7-1 of this regulation without the Fremont County Board of Health considering any concerns of the owner of property containing said feature. Property lines are considered offsite features. The property owner containing said feature must be notified of the time and date of the hearing.

e. No variance shall be issued, if it reduces the separation to ground water or bedrock based on the level of treatment in Table 7-2.

f. No variance from the horizontal setback from a well shall be issued unless it also meets the variance requirements of the Board of Examiners of Water Well Construction and Pump Installation Contractors.

g. No variance shall be issued for the installation of a higher level treatment system based on sizing or separation reductions without the Fremont County Public Health Agency having a maintenance and over sight program as defined in section 14.D. *Fremont County Public Health Agency does not have a maintenance and over sight program*

therefore separation distance reductions are not allowed in Fremont County.

6. **Variances for Repair of Failing Systems:**
   a. When a proposed variance for a system repair or upgrade would result in encroachment on minimum distances to physical features on neighboring properties required by the Division, the hearing procedures in 4.N.2, and 4.N.5.d above must be followed.
   b. For the repair of or upgrade to an existing system where the existing system does not meet the required separation distances and where conditions other than lot size precludes adherence to the required distances, a variance to the separation distances may be requested. The repairs or upgrade must be no closer to features requiring setbacks than the existing facilities. Variances requesting setbacks no closer than existing setbacks do not have to provide technical justification from a professional engineer or professional geologist.
7. **Findings on Appeal:**
   a. A request for Fremont County Board of Health review of the denial of an OWTS application must be made within 30 days after denial of an application by the Fremont County Public Health Agency.
   b. The applicant must bear the burden of supplying the Fremont County Board of Health with sufficient evidence to document that the denied system will be constructed and used in such a manner that will result in no greater risk than that associated with compliance with the requirements of the regulation, comply with the declaration and intent of this regulation, and comply with all applicable state and Fremont County regulations and required terms and conditions in any permit.
   c. Such review must be conducted pursuant to the requirements of section 24-4-105, C.R.S.

O. General Prohibitions: (Section 25-10-112, C.R.S.)

1. No city, county, or city and county shall issue to any person:
   a. A permit to construct or remodel a building or structure which includes plumbing, that is not serviced by a sewage treatment works until the Fremont County Public Health Agency has issued a permit for an OWTS.
   b. An occupancy permit for the use of a building that is not serviced by a sewage treatment works until the Fremont County Public Health Agency makes a final inspection of the OWTS, provided for in section 25-10-106 (1) (h), C.R.S. and the Fremont County Public Health Agency approves the installation.

2. No person shall:
    a. Construct or maintain any dwelling or other occupied structure which is not equipped with adequate facilities for sanitary disposal sewage. "Adequate facilities" do not include OWTS that are deemed to be failed, or any such condition that the local public health agency determines to be a public health and / or safety concern.
    b. Construct a new occupied structure that includes plumbing, without connecting to a domestic wastewater treatment works or obtaining an OWTS permit issued by the local public health agency and installing a compliant OWTS.
3. The construction of new, or the repair of existing cesspools is prohibited. Where an existing cesspool is failing a conforming OWTS must be installed. Where space is not available for a conforming OWTS, the criteria for repairs established within section 10.I must be followed.
4. A person must not connect more than one dwelling, commercial, business, institutional or industrial unit to the same OWTS unless such multiple connection was specified in the application submitted and, in the permit, issued for the system.
5. An OWTS must receive only such biodegradable wastes for treatment and distribution as are compatible with those biological treatment process that occur within the septic tank, any additional treatment unit, and the soil treatment area. This does not include industrial, animal, or process waste.
6. The parcel, lot or tract size shall comply with the provisions of the Fremont County Zoning Resolution which are as follows:
    a. For a legally valid parcel, lot or tract, excluding public rights-of-way or public easements, which existed as of January 1, 1995, the following shall apply:
        1. Where individual water wells are to be used with an onsite waste treatment system, a minimum of 4½ acres is required.
        2. Where public water is to be used with an onsite waste treatment system, a minimum of 1 acre is required.
        3. For all other uses (including travel trailer parks and campgrounds) the parcel, lot and tract size requirements vary with the use of individual water wells, public water, sewer and an onsite waste treatment systems, and shall comply with the Fremont County Zoning Resolution.
    b. A non-conforming parcel, lot or tract (a parcel, lot or tract which does not meet the zone district requirements for area or width or both) shall be of such size as to maintain the required separation distances between the onsite waste treatment system, the domestic water supply, the adjoining property's sewage system and/or domestic

water supply, and all other applicable minimum separations. All parcels, lots or tracts must have a primary site for an onsite waste treatment system plus an alternative site for replacement of the system.

7. All persons shall dispose of septage removed from systems in the process of maintenance or cleaning at an approved site and in an approved manner.

P. Septage:

1. Domestic septage

As defined by these regulations it is considered to exhibit the following characteristics:

Nitrogen:	(NH3-N)	150 mg/liter
Cadmium:		1 mg/liter
Copper:		10.5 mg/liter
Lead:		1 mg/liter
Nickel:		1 mg/liter
Zinc:		30 mg/liter

Q. Treatment and Disposal:

1. Septage Treatment Facility

a. Compliance with all applicable Fremont County Department of Planning and Zoning Regulations shall be required for any site on which a septage treatment facility is proposed.

b. Prior to the construction or installation of a proposed septage treatment facility, plans and specifications for the facility shall be submitted, reviewed and approved by the Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division, Water Quality Control Division (Sludge / Pretreatment Unit) and the Fremont County Environmental Health Department.

2. Septage Treatment

a. The following information shall be recorded and retained for a period of five (5) years for each individual load of untreated septage that is delivered to the treatment facility:

b. The name of the property owner where the septic tank is located.

c. The address of the property where the septic tank is located.

d. The quantity (in gallons) of septage removed from the septic tank.

e. The following certification statement:

> "I certify, under penalty of law, that septage removed from the septic tank to the best of my ability to determine, meets the definition of domestic septage and does not contain hazardous substances. This determination has been made under my direct supervision. I am aware that there are

significant penalties for false certification including the possibility of a fine and imprisonment, and / or civil penalties and damages."

3. **Pathogens – domestic septage.**

The pH of domestic septage applied to agricultural land, forest or reclamation site shall be raised to twelve (12) or higher by alkaline addition and without the addition of more alkali and shall remain at twelve (12) or higher for thirty (30) minutes. Each container of domestic septage applied to the land shall be monitored for compliance using these requirements.

4. **Vector Attraction Reduction – domestic septage.**

The pH domestic septage shall be raised to twelve or higher by alkali addition and, without the addition of more alkali, shall remain at twelve or higher for thirty minutes. Each container of domestic septage (wastewater) applied to the land shall be monitored for compliance with these requirements.

5. **The person who applies – domestic septage**.

The person who applies domestic septage must notify the Fremont County Public Health Agency that the domestic septage contained in the treatment tank or tanks has been treated and is ready for inspection. Such inspection shall occur within one (1) working day and shall be performed to ascertain whether or not the proper treatment has occurred. No application of the domestic septage may occur until the test has been completed. If the inspection fails to take place within the twenty four (24) hour time frame, then the alkaline-stabilized septage may be applied to the agricultural land, forest or a reclamation site.

a. The owner and/or operator of a septage treatment facility may be required to perform sampling and analysis of incoming domestic septage should reasonable grounds exist indicating that incoming domestic septage may contain any elements or compounds which could cause a hazard to the public health, or may contain elements in concentrations which exceed those levels specified in this section.
b. The owner and/or operator shall be notified in writing of the type of sample and of the analysis to be performed.

6. **Septage Disposal:**

a. The following hydrological data shall be provided for each disposal site:
    1. The location and depth of all wells within one mile, to water, water use, yield and an evaluation of impact of the proposed application on the groundwater.
    2. The location of all lakes, rivers, streams, springs and bogs within one mile of the site.

3. The depth to the maximum seasonal groundwater table.

b. The following soils data shall be provided for each disposal site:

1. The soils classification of each field as mapped or described by the U.S.
2. Soil samples analyzed per the following schedule:

Analysis Required

Parameter	Units	Pre-Application	Annually Thereafter	After 3rd year	After 7th year	Site Closure
Soil, texture	--------	X				
pH	pH units	X	X	X	X	X
CECl	meg/100g[2]	X		X	X	X

Analysis Required (Continued)

Parameter	Units	Pre-Application	Annually Thereafter	After 3rd year	After 7th year	Site Closure
Nitrate as N	ppm3	X	X		X	
Phosphorus	ppm	X	X		X	
Potassium	ppm	X	X		X	
Sodium	ppm	X	X		X	
Cadmium	ppm	X		X	X	X
Copper	ppm	X		X	X	X
Lead	ppm	X		X	X	X
Nickel	ppm	X		X	X	X
Zinc	ppm	X		X	X	X

1. cation exchange capability
2. micromhos per centimeter
3. parts per million

3. The owner and or operator of a septage disposal site may be required to perform soil monitoring for additional parameters and or at a greater frequency that specified in this section. Should reasonable grounds exist indicating that incoming domestic septage may contain any elements or compounds which could cause a hazard to the public health, or may contain elements or compounds in concentrations which exceed those levels specified in section 4.Q.b.2 of these regulations. The owner and or operator shall be notified, in writing, of the type of sample and of the analysis to be performed.

7. Site Requirements:

The following site requirements must be maintained for each disposal site.

a. No person shall apply domestic septage to land for beneficial use at a site located within 20 miles of a waste facility which can and will receive domestic septage.

b. No septage applied:

1. within a minimum of 500 feet of a residence, business or recreational area.

2. within a minimum of 50 feet of the property line of the disposal site.

c. No septage shall be applied:

1. without the depth of the annual high groundwater being established as greater than 6 feet in depth.
2. within 1000 feet the wellhead of a well supplying water for human consumption.
3. within 300 feet of a wellhead of any well.
4. On land located up gradient, and within 1 mile of the point at which surface waters are diverted for use in a public water system.
5. Within the boundaries of a 100 year flood plain or flood way.
6. On land within 300 feet of any body of surface water.
7. On land within 50 feet of a dry streambed.
8. Septage must not be applied to soil composed of "loamy sand or coarser materials" as those terms defined by the US Department of Agriculture (1977) Soil Texture Chart.
9. Septage will not be applied to land having a slope greater than six percent (6%).
10. Septage will not be land spread on saturated soil during rainfall events.
11. Septage will not be applied in such a quantity which would result in septage running off the application site.
12. Applying septage in excess of 5000 gallons per acre in a 24 hour period is prohibited
13. No septage will be applied in a manner which results in ponding of the septage.
14. The septage application site must not be irrigated within a 24 hour period after the application of septage has taken place.
15. Septage must not be applied to land which is currently receiving sludge from a wastewater treatment plant or has received such wastes within the previous 18 months.
16. Public access to a septage application site(s) must be restricted for a period of 18 months after the last application. Access shall be restricted by the remote location, fencing or posting of the site to minimize any human contact with septage.
17. Grazing of livestock will not be allowed within 6 weeks of the last application of septage.
18. Septage applied to frozen ground must be incorporated when the frost depth falls below 3 inches.
19. Septage must not be applied on snow cover exceeding 4 inches.

20. Septage must not be applied to agricultural land, forest or a reclamation site during a 365 day period if the annual application rate (below) has been reached:

$$AAR = \frac{N}{0.0026}$$

Where AAR = Annual application rate in gallons per acre per a 365 day period.

N = Amount of nitrogen in pounds per acre per a 365 day period as needed by the crop or vegetation grown on the land.

21. The following site restrictions must be met when alkaline-stabilized septage is applied to agricultural land, forest or a reclamation site:
    a. Food crops with harvested parts that touch the septage / soil mixture and are totally above the land surface shall not be harvested for a period of 14 months after any application of septage.
    b. Food crops or harvested parts grown below the surface of the land shall not be harvested for a period of 20 months after the application of septage if it remains on the land surface for a period of 4 months or longer prior to incorporating it into the soil.
    c. Food crops or harvested parts grown below the surface of the land shall not be harvested for a period of 38 months after the application of septage if it remains on the land surface for a period less than 4 months prior to incorporating it into the soil.
    d. Food crops, feed crops or fiber crops shall not be harvested for a period of 30 days after the application of septage.
    e. No septage shall be applied directly to any edible portion of any fruit or vegetable crop.
22. When domestic septage is applied to agricultural land, forest or a reclamation site, the person who applies the domestic septage will develop the following information and must retain it for a period of 5 years.
    a. The location by street address, latitude and longitude or a legal description of each site on which domestic septage is applied.
    b. The number of acres in each site on which domestic septage is applied.

c. The date and time the domestic septage is applied to each site.
d. The nitrogen requirement for the crop or vegetation grown on each site during a 365 day period.
e. The rate in gallons per acre at which domestic septage is applied to each site during a 365 day period.
f. The following statement:
"I certify, under penalty of law, that the pathogen requirements in section 4.Q.3. , and the vector attraction reduction requirements in section 4.Q.4. , have been met. This determination has been made under my direct supervision in accordance with the system design to ensure that qualified personnel properly gathered and evaluated the information used to determine that the pathogen requirements have been met. I am aware that there are significant penalties for false certification including the possibility of a fine and imprisonment and / or civil penalties and damages".
g. A description of how the pathogen requirements in section 4.Q.3 were met.
h. A description of how the vector attraction reduction requirements in section 4.Q.4 were met.
i. The initial pH of the untreated septage and the final pH following the alkaline stabilization shall be recorded.

R. Cease and Desist Orders:

1. The Fremont County Public Health Agency may issue an order to cease and desist from the use of any OWTS, or sewage treatment works which is found by the health officer not to be functioning in compliance with the OWTS Act or with applicable regulations or is found to constitute a hazard to public health, or has not otherwise received timely repairs under the provisions of section 25-10-106 (1) (j), C.R.S. Such an order may be issued only after a hearing which shall be conducted by the health officer not less than 48 hours after written notice thereof is given to the owner or occupant of the property on which the system is located. The order shall require that the owner or occupant bring the system into compliance or eliminate the health hazard within 30 days, or thereafter cease and desist from the use of the system. A cease and desist order issued by the health officer shall be reviewable in the district court for the county wherein the system is located and upon a petition filed not later than ten days after the order is issued.

S. Penalties: (Section 25-10-113, C.R.S.)

1. Any person who commits any of the following acts or violates any of the provisions of this section commits a civil infraction as defined in section 18-1.3-503, C.R.S.:
   a. Constructs, alters, installs, or permits the use of any OWTS without first applying for and receiving a permit as provided for in section 25-10-106, C.R.S.;
   b. Constructs, alters, or installs an OWTS in a manner which involves a knowing and material variation from the terms or specifications contained in the application, permit or variance;
   c. Violates the terms of a cease and desist order that has become final under the terms of section 25-10-106 (1) (k), C.R.S.;
   d. Conducts a business as a systems contractor without having obtained the license provided for in section 25-10-109 (1), C.R.S., in areas which the Fremont County Board of Health has adopted licensing regulations pursuant to that section;
   e. Conducts a business as a systems cleaner without having obtained the license provided for in section 25-10-109 (2), C.R.S., in areas which the Fremont County Board of Health has adopted licensing regulations pursuant to that section;
   f. Falsifies or maintains improper records concerning system cleaning activities not performed or performed improperly; or
   g. Willfully fails to submit proof of proper maintenance and cleaning of a system as required by regulations adopted by the Fremont County Board of Health.
2. Upon a finding by the Fremont County Board of Health that a person is in violation of this regulation, or of rules adopted and promulgated pursuant to section 25-10-104, the Fremont County Board of Health may assess a penalty up to fifty dollars for each day of violation. In determining the amount of the penalty to be assessed, the Fremont County Board of Health shall consider the seriousness of the danger to the health of the public caused by the violation, the duration of the violation, and whether the person has previously been determined to have committed a similar violation.
3. A person subject to a penalty assessed pursuant to section 4.S.2 may appeal the penalty to the Fremont County Board of Health by requesting a hearing before the appropriate body. The request must be filed within thirty days after the penalty assessment has been issued. The Fremont County Board of Health shall conduct a hearing upon the request in accordance with section 24-4-105, C.R.S.

5. Site and Soil Evaluation

A. **Site and Soil Evaluation Requirement:**

A site and soil evaluation must be conducted for each property on which an OWTS is proposed, to determine the suitability of a location to support an OWTS, and to provide the designer a sound basis to select the most appropriate OWTS design for the location and application.

1. Each site evaluation must consist of:
    a. Preliminary investigation;
    b. Reconnaissance;
    c. Detailed soil investigation; and
    d. Report and site plan.

B. **Preliminary Site Investigation:**

Research of information relative to the site and anticipated conditions must be conducted. Information gathered as part of the preliminary investigation must include, but is not limited to:

1. Property Information:
    a. Address;
    b. Legal description;
    c. Existing structures; and
    d. Location of existing or proposed wells on the property.
2. Fremont County Public Health Agency records.
3. Location of physical features, on and off the property that will require setbacks as identified in Table 7-1.
4. Preliminary soil treatment area size estimate based on information on existing or planned facility and Fremont County regulations.
5. Other information required by the Fremont County Public Health Agency.
6. Additional published information that may be useful to the site-specific evaluation; as available:
    a. Soil Information;
    b. Topography;
    c. Survey;
    d. Easements;
    e. Floodplain maps;
    f. Delineated wetlands maps.
    g. Geology and basin maps, descriptions;
    h. Climate information; and
    i. Aerial photographs;

C. **Reconnaissance Visit:**

A visit to the property to evaluate the topography and other surface conditions that will impact the location and design of the OWTS must be conducted.

Information gathered as part of the site reconnaissance may include, but is not limited to:

1. Landscape position;
2. Topography;
3. Vegetation;
4. Natural and cultural features; and
5. Current and historic land use.

Note: The reconnaissance evaluation may be conducted concurrently with the detailed soil investigation.

D. **Detailed Soil Investigation**

1. **Soil investigations to determine the long-term acceptance rate of a soil treatment area must be conducted per the following criteria:**
   a. Visual and tactile evaluation of two or more soil profile test pit excavations must be conducted to determine soil type as well as to determine whether a limiting layer is encountered.
   b. In addition to the two soil profile test pit excavations, percolation testing may be conducted to obtain additional information regarding the long-term acceptance rate of the soil.
   c. If the site evaluation includes both a visual tactile evaluation of the soil profile pit excavations and percolation test, and the results from these two evaluations do not coincide with the same LTAR as noted in Table 10-1, the designer must use the more restrictive LTAR in determining the size of the soil treatment area.
2. **Procedure for performing visual and tactile evaluations of soil in order to determine a long-term acceptance rate:**
   a. Evaluation of two or more soil profile test pit excavations must be performed to determine soil types, limiting layers, restrictive layers, ground water conditions, and the best depth for the infiltrative surface. The total number of soil profile test pit excavations beyond the required two shall be based on the judgement of the competent technician.
   b. At least one of the soil profile test pit excavations must be performed in the portion of the soil treatment area anticipated to have the most limiting or restrictive conditions.
   c. The minimum depth of the soil profile test pit excavation must be to any limiting layer, groundwater condition, or four feet below the infiltrative surface of the in-situ soil, whichever is encountered first.
   d. Layers and interfaces that interfere with the treatment and dispersal of effluent must be noted. Thus, any restrictive soil characteristic such as consistence, as defined by a cementation class, also needs to be evaluated.

(1) When cemented soils are encountered, the evaluation must identify the cementation class from rupture resistance as provided in Table 5-1, "Rupture Resistance".

(2) Per the "Rupture Resistance" Table noted in item d.1 above, when the "Cementation Class" is identified within the soil profile as "strongly", "very strongly cemented", or "indurated" that layer will be classified as a "restrictive layer".

(3) Note: Cemented soils will typically have characteristics of Type 3A or 4A soils (Table 10-1). Long term acceptance rates should coincide with the appropriate soil type classification or be adjusted to address the level of cementation.

Table 5-1: Rupture Resistance: Blocks, Peds, Clods – Estimate the force required to rupture (break) a soil unit.

Dry Cementation Class	**Specimen Falls Under**
Loose	Intact specimen not obtainable
Non-cemented	Very slight force between fingers
Extremely weakly cemented	Slight force between fingers
Very weakly cemented	Moderate force between fingers
Weakly cemented	Strong force between fingers
Moderately Cemented	Moderate force between hands
Dry Cementation Class	**Specimen Falls Under**
Strongly Cemented	Foot pressure by full body weight
Very Strongly Cemented	Blow of > 4.5 lbs., but not body weight
Indurated	Blow of > 4.5 lbs. weight dropped at 6 inches

Source: NRCS Field Book for Describing and Sampling Soils, Version 3.0; 2021 Reprint; Consistence section, pg. 2-63. Dry Rupture Resistance applies to soils that are moderately dry or drier.

e. The soil observations must be conducted at or immediately adjacent to the location of the proposed soil treatment area, but, if possible, not under the final location of a trench or bed.

f. Each soil profile test pit excavation observed at the proposed soil treatment area must be evaluated under adequate light conditions with the soil in an unfrozen state.

g. The soil observation method must allow observation of the different soil horizons that constitute the soil profile.

h. Soil profile test pit observations must be conducted prior to percolation tests to determine whether the soils are suitable to warrant percolation test and, if suitable, at what depth the percolation tests must be conducted.

i. The soil type at the proposed infiltrative surface of the treatment area or a more restrictive soil type within the treatment depth must be used to determine the long-term acceptance rate from Table 10-1 or Table 10-1A. The Treatment depth is two to four feet depending on the required thickness for the treatment level below the infiltrative surface from Item 4, Table 7-2

j. Soils data, previously collected by others at the site for the purposes of an OWTS design at the discretion of the Fremont County Public Health Agency. It is recommended that the data be verified, at a minimum, by performing an evaluation of a soil profile test pit excavation.

3. **Soil descriptions for determination of a limiting layer must include:**

a. The depth of each soil horizon measured from the ground surface and a description of the soil texture, and structure of each horizon.

b. Depth of bedrock;

c. Depth of periodically saturated soil as determined by;

(1) Redoximorphic features and other indicators of water levels or;

(2) Depth of standing water in the soil observation excavation, measured from the ground surface, if observed, unless redoximorphic features indicate a higher level.

4. **When a percolation test is determined to be necessary to obtain additional information regarding soil permeability, the following procedures for performing percolation tests must be followed:**

a. The percolation testing must be performed by a professional engineer or by a trained person under the supervision of a professional engineer or by a competent technician.

b. Number of test holes; Location

(1) Soil percolation tests shall be performed in at least three test holes in the area in which the soil treatment area is to be located, spaced evenly over the proposed area.

(2) If the likely depth of a proposed infiltrative surface is uncertain, percolation tests must be performed at more than one depth to determine the depth of the infiltrative surface.

c. Dimensions

(1) The percolation test hole must have a diameter of eight to 12 inches and be terminated a minimum of six inches and a maximum of 18 inches below the proposed infiltrative surface.

d. Change in Soil

(1) If a change of soil type, color or structure is present within those soils comprising the depth of soil below the infiltrative surface as required in Table 7-2 for vertical separation, a minimum of two soil percolation holes must be terminated in the changed soil, and percolation tests must be conducted in both holes.

e. Percolation Tests

(1) The percolation tests must be conducted using the hole preparation, soil saturation and rate measurement procedures described below.

(2) Preparation of Percolation Test Holes

(i) Excavate the hole to the depth and diameter required.

(ii) Carefully scrape the bottom and sides of the hole with a knife blade or sharp instrument to remove any smeared soil surfaces and provide a natural soil interface into which water may percolate.

(iii) Remove all loose soil from the hole.

(iv) Add two inches of very coarse sand or fine gravel to protect the bottom of the hole from scouring and sediment.

(3) Presoak

(i) The hole must be presoaked adequately to accomplish both saturation, which is filling the void spaces between the soil particles, and swelling, which is the intrusion of water into the individual soil particles.

(ii) To presoak the hole, carefully fill the hole with clean water to a minimum depth of 12 inches over the gravel placed in the bottom of the hole. In most soils, it is necessary to refill the hole by supplying a surplus reservoir of clean water, possibly by means of an automatic siphon, to maintain water in the hole for at least four hours and preferably overnight. Determine

the percolation rate 24 hours after water is first added to the hole. This procedure is to ensure that the soil is given ample time to swell and to approach the condition it will be in during the wettest season of the year. In type 1 soils, (sand and loamy sand; Table 10-1), the swelling procedure is not essential, and the test may be conducted after the water from one filling of the hole has completely seeped out of the hole.

(4) Percolation Rate Measurement

(i) With the exception of type 1 soils, percolation rate measurements must be made on the day following the presoak procedure.

(ii) If water remains in the percolation test hole after the swelling period, adjust the depth to approximately six inches above the gravel in the bottom of the hole. From a fixed reference point, measure the drop in water level over a 30 minute interval. The drops are used to calculate the percolation rate.

(iii) If no water remains in the hole after the swelling period, carefully add clean water to bring the depth of water in the hole to approximately six inches above the top of the gravel in the bottom of the hole. From a fixed reference point, measure the drop in water level at 30 minute intervals for four hours, refilling to six inches over the top of the gravel as necessary. The drop in water level that occurs during the final 30-minute period is used to calculate the percolation rate. If the water level drops during prior periods provide sufficient information, the procedure may be modified to suit local circumstances. The requirement to conduct a four hour test under this section is waived if three successive water-level drops do not vary by more than 1/16 inch; however, in no case shall a test under this section be less than two hours in duration.

(5) Sandy Soils

(i) In sandy soils or other soils in which the first six inches of water seeps out of the hole in less than 30 minutes, after the 24 hour swelling period, the time interval between measurements must be ten minutes and the test conducted for one hour. The drop that occurs

during the final ten minutes must be used to calculate the percolation rate.

(ii) If the soil is so sandy or coarse-textured that it will not retain any water, then the infiltration rate must be recorded as less than one minute per inch.

(6) Special Soil Types

(i) The Fremont County Public Health Agency may identify soil types in its area, for which different procedures such as extra presoaking or an extended testing time to obtain a valid percolation rate will be required.

(7) Percolation Rate Determination and Reporting

(i) The field percolation rate will be the average rate of the percolation rates determined for all percolation test holes observed in the proposed soil treatment area in minutes per inch. The average percolation rate determined by the tests must be used in determining the long-term acceptance rate for the proposed system from Table 10-1.

(ii) The technician performing the percolation tests shall furnish an accurate scale drawing, showing the location of the soil profile test pit excavations and/or percolation holes tied to lot corners or other permanent objects. The drawing must meet the criteria in section 5.F.1.g. The information in the subsections following section 5.F.1.g.(1) through 5.F.1.g.(5). may be included but is not required for this drawing. All holes must be clearly labeled to relate to the information provided for the profile test pits and percolation tests.

(8) Alternate Percolation Testing

(i) Alternate percolation test procedures may be approved, provided the test results of alternate procedures are substantially equivalent to those determined using the test procedures described in this section.

(ii) Prior approval from the Fremont County Public Health Agency of alternate percolation test procedures is required.

E. **Evaluation and Marking of Soil Profile Test Pit Excavations or Percolation Holes:**

1. The engineer or technician conducting the soil profile test pit excavation or percolation tests must, upon completion of the tests adequately mark and identify each excavation or hole to allow easy location by others.
2. The objective of the regulation is to ensure a detailed and accurate identification of the soils on each site, while concurrently ensuring the safety of the practitioner, general public and wildlife. In order to accomplish this, the following items are noted:
    a. In order to address public safety concerns, the regulatory intent is to backfill all soil profile test pits promptly after the soil evaluation is complete.
    b. The Fremont County Department of Environmental Health does not perform soil evaluations. All tests shall be performed by an engineer or competent technician or both.

F. **Soils Report and Site Plan:**

1. A written report must describe the results of the preliminary investigation, reconnaissance, and detailed evaluations. The report may be in text and/or tabular form and must include a drawing locating features relative to the proposed OWTS location and test locations. The report may be included as part of the OWTS design document. The report must include, but is not limited to:
    a. Company name, address, telephone number, e-mail address, and name of individual, credentials and qualifications of the individual conducting the site evaluation;
    b. Preliminary and detailed evaluations, providing information from the surface site characteristics assessment and soils investigation;
    c. Dates of preliminary and detailed evaluations;
    d. A graphic soil log, to scale, indicating depth of the soil test pit excavation, soil description and classification, depth to any limited layer encountered, type of equipment used to excavate the soil profile test pit and date of soils investigation.
    e. Setback distances to features listed in Table 7-1;
    f. Setback distances to features listed in Table 7-2, existing on the site or within applicable setback limits, whichever is greater;
    g. A drawing created to a scale that provides the complete property boundary lines. The minimum drawing size is 8.5-inches by 11-inches. If the property is too large to adequately show site evaluation information, a detailed drawing that includes the information required from the site and soil evaluation that will impact the

location of the OWTS must be submitted. Drawings must indicate dimensions, have a north arrow and graphic scale, and include:

(1) Fixed non-degradable temporary or permanent benchmark, horizontal and vertical reference points of the proposed soil treatment area; soil observations; percolation testing results and pertinent distances from the proposed OWTS to all required setbacks, lot improvements, easements; ordinary high water mark of a pond, creek, stream, lake, wetland or other surface waters, and detention or retention ponds; and property lines;

(2) Contours or slope direction and percent slope;

(3) The location of any visible or known unsuitable, disturbed or compacted soils;

(4) The estimated depth of periodically saturated soils and bedrock, or flood elevation, if applicable; and

(5) The proposed elevation of the infiltrative surface of the soil treatment area, from an established datum (either ground surface or a benchmark);

h. Anticipated construction-related issues, if applicable;

i. An assessment of how known or reasonably foreseeable land use changes are expected to affect the system performance, including, but not limited to, changes in drainage patterns, increased impervious surfaces and proximity of new water supply wells, if applicable; and

j. A narrative explaining difficulties encountered during the site evaluation, including but not limited to identifying and interpreting soil and landform features and how the difficulties were resolved, if applicable.

G. **Design Document:**

1. The report and site plan may be attached to the design document, or the report and site plan may be combined with the design information as a single document.

2. The design document must include a brief description of the facility and its proposed use, basis and calculations of design flow, and influent strength.

3. The design document must contain all plan details necessary for permitting, installation and maintenance, including:

a. Assumptions and calculations for each component, including dose volume, total dynamic head (THD) and gallons per minute (GPM) for all dosing systems

b. A fixed, non-degradable temporary or permanent benchmark, (North America Vertical Datum or assumed elevation is acceptable);

c. A scale drawing showing location of each OWTS component and distances to water supplies, surface water, easements, physical and health impact features on both the subject and adjacent properties requiring setbacks;

d. Layout of soil treatment area, dimensions of trenches or beds, distribution method and equipment, distribution boxes, drop boxes, valves, or other components used;

e. Contours or slope direction and percent slope for the area of the OWTS;

f. Elevation or depth of infiltrative surface of the soil treatment area, septic tank invert, and all other components of the OWTS. For sites with minimal elevation change, providing the depth of the components from grade is acceptable. However, where the site has noticeable elevation changes, it is the expectation that the proposed elevations of all components, relative to the site benchmark, be provided.

g. Special structural design considerations, as applicable to ensure the long-term integrity of each component;

h. References to design manuals or other technical materials used;

i. Installation procedures, as applicable;

j. Operation and maintenance manuals or instructions; and

k. Other information that may be useful such as photos and cross-section drawings.

H. **Site Protection:**

Prior to and during construction, the proposed soil treatment area and replacement area, if any, must be protected from disturbance, compaction, or other damage by means of staking, fencing, posting, or other effective methods.

I. **Qualifications for a Competent Technician:**

1. **Percolation Tests:**

a. Competencies needed:

(1) Set up equipment;

(2) Perform and run percolation tests according to the procedures identified in section 5.D.4 of this regulation; and

(3) Record results and calculate percolation rates.

b. The Fremont County Public Health Agency may approve training for percolation testing.

2. **Visual and Tactile Evaluation of Soil**:

a. Competencies needed:

(1) Identify soil types by hand texturing and observation;

(2) Identify presence or absence of soil structure;

(3) Identify soil consistence / cementation;

(4) Identify type and grade of soil structure;
(5) Recognize evidence of highest seasonal water surface;
(6) Identify limiting layers, restrictive layers, and groundwater conditions;
(7) Determine the appropriate depth for infiltrative surface of OWTS, soil profile test pits, and for percolation tests, if used; and
(8) Understand basic principles of OWTS siting and design.

b. Possible demonstrations of competence in visual and tactile evaluation of soil:
(1) Degree in soil science, agronomy, geology, other majors if a course(s) in soil morphology was included; or
(2) Attendance at training or workshop for soil evaluation for OWTS including both class and field work.
(i) If the training or workshop includes an exam to verify acceptable completion of the course, a passing grade on the exam must be attained.

c. The Division must approve training for visual and tactile evaluation of soil.

6. Wastewater Flow and Strength

A. Wastewater Flows

1. **General:**

The Fremont County Public Health Agency may require the installation of a meter to measure flow into the facility or the OWTS.

2. **Single-Family Residential Homes:**

a. Design flow per person must be at least 75 gallons per day (gpd).

b. The Fremont County Public Health Agency may only increase the wastewater design flow per person to 100 gpd on a case by case basis, where justified.

c. The minimum design flow for a new home must be for a two-bedroom house, unless otherwise noted in this regulation. The minimum design flow for the repair or replacement of an OWTS of an existing one-bedroom home *must be designed for two bedrooms unless area constraints will only allow a one bedroom design flow.*

d. The Fremont County Public Health Agency has increased the number of persons per bedroom to two for all bedrooms for design purposes.

e. Table 6-1 summarizes the design flows for single-family residential homes up to six bedrooms. The Fremont County Public Health Agency has the authority to adjust these values as described in sections 6.A.2.b. and 6.A.2.d.

f. If a new home has unfinished areas, the Fremont County Public Health Agency may increase the number of bedrooms used for the design of the OWTS by one or two bedrooms based on an assumption that 150 square feet of unfinished space can be converted into a bedroom, if the space can meet building code requirements for a bedroom.

g. The Fremont County Public Health Agency may increase the design flow per bedroom by 50 gal. per additional bed, where there are provisions for more than two occupants within a bedroom, such as bunk beds, etc. The intent of this section is to address short-term rental units and other similar uses.

h. Accessory Dwelling Units (ADU's)

(1) An "accessory dwelling unit" is considered a smaller, independent residential dwelling located on the same lot as the primary stand-alone single-family dwelling.

(2) A new or expanded OWTS must be sized for the number of bedrooms proposed within the accessory dwelling unit.

Table 6-1 Single-Family Residential Design Flows

# Bedrooms	Occupancy (# of Persons)	Wastewater Flow Per Person (gallons/day)	Design Flow (gallons/day)
2	4	75	300
3	6	75	450
4	8	75	600
5	10	75	750
6	12	75	900

3. **Auxiliary Buildings:**

a. If a single-family home has an auxiliary building, such as a non-commercial shop with plumbing fixtures, the flow may be conveyed to the OWTS of the home, or to a separate OWTS constructed to handle the flow from the auxiliary facility.

b. If the flow from the auxiliary building is only generated by residents of the home, it will be assumed that the OWTS for the home will be adequately sized to include the auxiliary building if the flows are combined.

c. If the auxiliary building will have users in addition to residents, and the flow from the auxiliary building will flow to the OWTS of the

home, the design flow of the home must include the increased use of each fixture proposed.

d. If the auxiliary building has a separate OWTS, the system must be sized on the basis of Table 6-2 and a septic tank detention time of 48 hours.

4. **Multi-Family and Commercial On-site Wastewater Treatment Systems:**

a. Design flow values and strengths for multi-family and commercial systems must be determined from:

(1) Table 6-2; or

(2) An analysis of peak flows and strengths from at least three comparable facilities or from the facility, if it is an existing facility, must be submitted to the Fremont County Public Health Agency for approval. The analysis must include:

(i) Metered water flows for inside use only for at least a year, or if use is seasonal, for a full season. If metered flows are less than full capacity, they must be paired with actual use in units of persons present or meals served or other units as appropriate so that an actual daily rate per unit can be determined. The daily rate per unit times the number of units at full occupancy will be the design flow.

(ii) Total Suspended Solids and BOD_5 or $CBOD_5$ tests at times of full use. At least three samples taken at least one week apart are required. Sampling that provides equivalent and representative data through "composite sampling" may be allowed

(iii) Explanation and justification for the comparability of the tested facilities with the proposed facility.

(3) When a specified use is proposed which is not addressed within Table 6-2, and where flow data from similar facilities is not available, the design document must provide reference to an alternate regulatory or industry standard for the OWTS from where the proposed flow and water quality data was obtained. Estimates must include peak flows relative to the full occupancy.

5. **Flow Equalization:**

a. Flow equalization may be used if a facility has flows that vary from day to day by more than four times the average flow.

b. The highest peak assumed must be at least equal to the full capacity of the facility.

c. The stored flow must be distributed to the soil treatment area before the next greater-than-average peak.

d. Flow equalization may be used only if:
   (1) The facility is non-residential;
   (2) The facility is only used for one purpose;
   (3) Flows will follow a predictable pattern; and
   (4) There is a long-term expectation that size and pattern of the flows will remain the same.

e. Timed dosed pressure distribution or timed dosed NDDS must be used. The soil treatment area reduction for pressure distribution (Table 10-2) must not be used in addition to the flow equalization reduction.

f. Contingency plans must be specified for expanding the capacity of the OWTS in the event of changed use at the facility.

TABLE 6-2 For design purposes, the Estimated Daily Wastewater Flow and BOD_5 Load is "Per Person" Unless Otherwise Noted[5]

RESIDENTIAL WASTEWATER	**GPD**	**BOD_5 IN POUNDS PER DAY**
Single-family dwellings, Accessory dwelling units	75	.20
Auxiliary buildings by fixture type		
Bath/Shower	14.7	.014
Dishwasher	1.8	.002
Kitchen sink with garbage grinder	5.8	.052
Laundry washer	19.5	.037
Lavatory	8.4	.021
Water closet (toilet)	24.8	.029
RESIDENTIAL, OTHER	**GPD**	**BOD_5 IN POUNDS PER DAY**
Hotels and motels per room	75	.15
Multiple-family dwellings or apartments	75	.20
Boarding and rooming houses (users absent during working hours)	50	.15
Tiny Homes [3], per unit	150 (3)	.40 (3)
Mobile home	75	.20
Mobile home park per space	300	.80

Vacation home rental; per additional bed space provided; in addition to the 150 gal./bedroom [4]	50	20
COMMERCIAL WASTEWATER	**GPD**	**BOD_5 IN POUNDS PER DAY**
Day-use, or Transient Facilities		
Examples: Airports or bus stations per passenger; fairgrounds per person attending; ball parks, race tracks, stadiums, theaters or auditoriums per seat	5	.02
Airport per employee	10	.06
Banquet halls per seat with food preparation, per event	7.5	.06
Banquet halls per seat, no food preparation, per event	5	.02
Barber and beauty shops per chair	100	.70[1]
Bowling alleys per lane - toilet wastes only	5	.03[4]
Convenience Stores with self-serve beverages	See footnote 7	See footnote 7
Country club per member	30	.02
County club per employee	20	.06
Dentist offices per non-wet chair	50	.14[1]
Doctor offices per doctor	250	.80[1]
Farm workers, factories and plants exclusive of industrial wastewater per employee per eight-hour shift–no showers	20	.05
Farm workers, factories and plants exclusive of industrial wastewater per employee per eight-hour shift - showers provided	35	.08
Laundries, self-service per commercial washer	400	.75
Office buildings per employee per eight-hour shift	15	.06
Service stations per toilet fixture	250	.50[1]
Stores and shopping centers per square foot of retail space	.1	.01[1]
Work or construction camps semi-permanent with flush toilets	50	.17
Work or construction camps semi-permanent without flush toilets	35	.02

FOOD SERVICE ESTABLISHMENT	**GPD**	**BOD_5 IN POUNDS PER DAY**
Coffee shop per customer	**3.5**	**.50**[1, 8]
Restaurant open 1 or 2 meals per seat	50	.06/meal
24-hour restaurant per seat	75	.07/meal served
Restaurant with paper service only per seat	25	.01/meal served
Additional for bars and cocktail lounges per seat	30	.02
Drive-in restaurant per car space	50	.02
INSTITUTIONAL WASTEWATER WITHOUT KITCHENS UNLESS OTHERWISE NOTED	**GPD**	**BOD_5 IN POUNDS PER DAY**
Churches, per seat; without any food service, or other uses	3.5	.01
Churches, per seat; warming kitchen only, no major food service	5	.01
Churches, per seat; with food service, per meal served.[4]	47.5	.02
Hospitals per bed space	250	.20
Nursing homes; Group homes for developmentally disabled per bed space	125	.20
Schools, Boarding per person	100	.17
Schools, Day without cafeteria, gym or showers	15	.04
Schools, Day with cafeterias, no gym or showers	20	.08
Schools, Day with cafeterias, gym and showers	25	.10
Schools, Day additional for school workers	15	.06
RECREATIONAL AND SEASONAL WASTEWATER USE	**GPD**	**BOD_5 IN POUNDS PER DAY**
Camps, day, no meals served	15	.12
Children's camp, overnight with meals and showers	50	.12
Luxury resort[6]	125	.17
Resort night and day	50	.12
Campground per campsite [2]	50	.12
Public park flush toilet per fixture per hour when park is open	36	.04 lbs./ fixture
Public park urinal per fixture per hour when park is open	10	.01 lbs./fixture

Public park shower per fixture per hour when park is open	100	.10 lbs./ fixture
RECREATIONAL AND SEASONAL WASTEWATER USE (Continued)	**GPD**	**BOD_5 IN POUNDS PER DAY**
Public park faucet per fixture per hour when park is open	15	.04 lbs./ fixture
Swimming pools and bathhouses	10	.06
Travel trailer parks with individual water and sewage hookup per unit [2]	100	.24
Travel trailer park without individual water and sewage hookup per unit [2]	50	.12

1. BOD levels may require further verification depending on the specific use of the facility.
2. Laundry facilities are to be calculated on a per commercial washer basis in accordance with other elements of this table.
3. For a "tiny home" the OWTS may be sized as a one-bedroom home.
4. As stated in section 6.A.2.i, the Fremont County public health agency may increase the "per bedroom" design flows for the vacation home rentals relative to the expected maximum occupancy of the home. These flows are in addition to the 150 gal./bedroom requirement.
5. Note that discharges from non-domestic sources such as processed waste, industrial waste, microbreweries, dog kennels, veterinary clinics, horse barns, etc. are not addressed in this regulation. Such discharges must obtain permitting as a Class V Injection Well through the EPA, as appropriate.
6. A "Luxury Resort" will typically include a spa, restaurant/bar, pool, etc.
7. Wastewater from convenience stores will likely meet the requirements of high strength waste. Studies indicate that BOD^5 effluent levels will range between 500 – 1500 mg/l. The exact levels will depend on products available (i.e.: coffee, soda, etc.), numbers of patrons, and how often the excess from each product is disposed. Flows from each facility can also vary substantially depending on location and the size of the store. Locations adjacent to freeways could have significantly more flow than a site located in a residential area. Subsequently, the design engineer must provide data from similar facilities in order to afford an estimation of the projected peak flows.
8. Wastewater from coffee shops will likely meet the requirements of high strength waste. Studies indicate that BOD^5 effluent levels may exceed 500 mg/l. The exact levels will depend on the drink options (i.e.: latte, espresso, etc.), number of patrons, and how often the excess from each product is disposed. Flows from each facility can vary substantially depending on location and size of the store. Subsequently, the design engineer must provide date from similar facilities in order to afford an estimation of projected peak daily flows.

B. Wastewater Strength

1. Table 6-3 includes levels of treatment that can be achieved by various OWTS components, excluding the soil treatment area. Systems qualifying for these treatment levels except TL1 produced by a septic tank alone must be approved under section 13 of this regulation. If soil treatment area or vertical separation distance reductions are permitted, the Fremont County public health agency must have a maintenance oversight program under section 14.D. in place.
2. High strength waste must be reduced to at least Treatment Level TL1 quality or lower before applying to a soil treatment area. Waste strength levels defined in Tables 6-3 and 6-4 must be used to determine compliance.

Table 6-3 Treatment Levels

Treatment Level	BOD_5 (mg/L)	$CBOD_5$[1] (mg/L)	TSS (mg/L)	Total Nitrogen (mg/L)	Fecal Coliform[5]
TL-1 [2]	180	-	80	60-80	
TL-2	-	25	30	N/A[3]	
TL-2N	-	25	30	>50% reduction[4]	
TL-3	-	10	10	N/A[3]	
TL-3N	-	10	10	20	
TL3ND	-	10	10	20	≤200 per 100 mL.

Shading indicates higher treatment levels

1. Requirements for $CBOD_5$ are only related to effluent samples from a higher level treatment.
2. Domestic septic tank effluent prior to soil treatment or higher level treatment has a wide range of concentrations. These values are typical, but values used for design must account for site-specific information.
3. Total nitrogen does not apply to treatment levels TL2 and TL3. Processes intended to reduce total nitrogen are addressed in treatment levels TL2N and TL3N. Any total nitrogen reductions that may be observed for TL2 and TL3 are as result of the treatment process for BOD_5 and TSS reductions
4. NSF/ANSI Standard 245 – Wastewater Treatment Systems – Nitrogen Reduction requires reduction of 50 percent rather than an absolute value.
5. TL3ND requires effluent to be treated to TL3N standards prior to disinfection. The disinfection must meet the requirements of section 12.H
6. With the exception of fecal coliform, treatment level requirements are based on values obtained from composite sampling.

Table 6-4 High Strength Wastewater*

	BOD_5 (mg/L)	TSS (mg/L)	Fats, Oils, Grease (FOG) (mg/L)
Septic Tank Influent	>300	>200	>50
Septic Tank Effluent	>180	>80	>25

*High Strength wastewater prior to a septic tank has a wide range of concentrations. These values are typical, but values used for design purposes must account for site-specific information.

7. Minimum Distances between Components of an On-site Wastewater Treatment System and Physical Features

A. **Horizontal Distances, General:**

Horizontal distances from the various components of a system to pertinent terrain features, including streams, lakes, water courses, springs, wetlands, wells, subsurface drains, cisterns, water lines, suction lines, dry gulches, cut banks, dwellings, other occupied buildings and property lines, must be in accordance with Table 7-1. The setback requirements are applicable for minimum system performance and treatment levels with specific modifications allowed for higher treatment levels as provided in Table 7-2. All distance setback modifications must be analyzed and approved by the Fremont County board of health or the Fremont County public health agency and be in complete compliance with the variance or administrative procedures identified within this regulation and those of the Fremont County board of health. Acceptable methods of analyzing horizontal separation distances with higher treatment levels include but are not limited to:

1. Analyzing the intended uses of impacted surface and/or ground waters;
2. Contacting adjacent property owners for potential conflicts with property line encroachments; and
3. Analyzing potential impacts that system locations may have on building foundations and other potentially affected features.

B. **Reductions in Separation Distances:**

Reductions in separation distances with higher level treatment must include provisions for operation and maintenance for the life of the system, as described in section 14.D. **The FREMONT COUNTY BOARD of HEALTH has elected not to allow any reductions in separation distances.**

C. **Dry Gulches, Cut Banks and Fill Areas:**

1. Separation distances to dry gulches, cut banks and fill areas in Table 7-1 must apply unless the designer or design engineer determines by observation of the exposed slope of the dry gulch or cut bank or soil profile test pit excavations that a limiting layer is present that will direct or allow the effluent from the soil treatment area to move laterally and surface. In this instance, a greater distance may be required
2. A lesser distance may be used if it can be demonstrated by a professional engineer or professional geologist that the use of a barrier, such as a minimum 30 mil PVC liner placed between the soil treatment area and the slope of the dry gulch, cut bank or fill area will prevent effluent surfacing laterally.
3. The separation distance between a component and the crest of a dry gulch or cut bank will be evaluated for potential erosion or slope instability if the component and the slope are in close proximity. If there is potential for

erosion or instability, the separation distance must be increased until the risk is minimized.

D. **Minimum or Increased Distances:**

Components of an OWTS listed in Table 7-1 must be installed or located in accordance with the minimum distance requirements provided in the table or such increased distances provided by Fremont County Board of Health regulations, unless otherwise noted below:

1. The Fremont County Board of Health may choose to allow the Fremont County Public Health Agency to permit the installation of an OWTS at a reduced property line setback in accordance with the following criteria:
    a. If the property can accommodate the installation of an OWTS no closer than required minimum 10-foot property line setback, it must do so. If the proposal complies with the requirements of this section and is deemed acceptable by the Fremont County Public Health Agency, the Fremont County Public Health Agency may administratively allow a reduction to the setback.
    b. The property line setback must not be reduced to any less than 3 ft., unless a variance by the Board of Health is provided.
    c. The property line setback encroachment must be proposed at the time of permit application and must include the following information:
        1. A statement from the applicant and /or designing engineer providing the reason for the reduced property line setback request.
        2. The applicant must demonstrate that the allowance of encroachment of the property line setback will not inhibit the development of surrounding properties (i.e. by allowing the encroachment of the property line setback, a neighboring property would not be able to meet the minimum setback requirement between the subject OWTS and a proposed adjacent well).
        3. The applicant must demonstrate that all activities associated with the installation of the proposed OWTS will not encroach on a neighboring property, and / or provide written permission from the adjacent owner or property manager of said property allowing the encroachment of machinery or excavated materials in order to install the proposed OWTS.
        4. The proposed OWTS must comply with all other setbacks noted in Table 7-1. The Fremont County Public Health Agency approval of the encroachment must only be for the referenced property line setback.

5. The applicant must submit a survey of the property line(s) that the proposed setback encroachment will impact. The survey must include:
   (i) A survey completed by a Colorado registered professional land surveyor in accordance with section 12-120-301 et seq., C.R.S.
   (ii) A legal description and drawing of the subject property. Said drawing must also include the location of the proposed OWTS, onsite and adjacent wells.
   (iii) The surveyor must clearly mark the surveyed property line(s) in a manner that is clearly defined and will not degrade over time due to exposure to the elements. The markings must remain in place until after the system construction and final approval by the Fremont County Public Health Agency.

d. Prohibitions

(1) Approval for an encroachment of the property line setback must not be provided after installation of the OWTS. Any post-construction reduction will require a variance by the Fremont County Board of Health.

(2) A reduction in the setback to a property line may only be granted where a minimum separation of six feet between soil treatment areas on all adjacent properties is provided.

(3) The size of the soil treatment area must comply with section 10.C of this regulation.

(4) Property line setback reductions are prohibited where multiple systems on the subject property are proposed and the combined capacity of the systems exceed 2,000 GPD.

E. **Separation Distances to Specific Features:**

Table 7-2 provides the required site evaluation, design, and treatment level considerations necessary to evaluate the site and to design and locate the soil treatment area component of an OWTS.

1. Items 1, 2 and 3 in Table 7-2 address the allowable horizontal setback distance between the soil treatment area and the following physical features:
   a. Setback distance from soil treatment area to on-site well (Item 1);
   b. Setback distance from soil treatment area to water features (Item 2); and
   c. Setback distance from soil treatment area to a dry gulch or cut bank (Item 3).

2. Item 4 in Table 7-2 addresses the required vertical separation distance between the infiltrative surface of the soil treatment area and the limiting layer, or the required depth of soil comprising the soil treatment area.
3. The designer may select the level of treatment from Table 7-2 to be applied to the soil treatment area that is necessary in order to accommodate the site conditions, if higher level treatment for that purpose is permitted by the Fremont County Public Health Agency.

Table 7-1 Minimum Horizontal Distances in Feet between Components of an On-Site Wastewater Treatment System and Water, Physical and Health Impact Features[7,10]

	Spring, Well,[1,9] Suction Line, Underground Potable water supply cistern[4]	Potable Water Supply Line[2]	Structure with Basement, Crawl space or footing drains	Structure without basement, crawl space or footing drains	Property Lines[11], Upslope curtain drain	Subsurface Drain, Intermittent Agricultural Irrigation Lateral[7], Lined Pond or Irrigation Channel, Drywell, Storm Sewer, Stormwater Structure	Surface water, Lake, Water Course, Open Irrigation Channel[7], Stream, Wetland	Dry Gulch, Cut Bank, Fill Area (from Crest), In-ground pools	Septic Tank, Higher level treatment Unit, Dosing Tank, Vault or Privy
Septic Tank, Higher Level Treatment Unit, Dosing Tank, Effluent pipe[2],Vault or Vault Privy	50(2)	10(2)	5	5	10	10	50	10	--
Building Sewer	50(2)	5(6)	0	0	10(2)	10(2)	50(2)	10(2)	--
STA Trench, STA Bed, Unlined Sand Filter, Sub-surface Dispersal System, Seepage Pit	100(3)	25(2)	20	10	10	25	50(3)	25	5
Lined Sand Filter	60	10(2)	15	10	10	10	25	10	5

Lined Evapo-transpiration Field or Outside of Berm of Lined Wastewater Pond	60	10[(2)]	15	15	10	10	25	10	5
Open Unlined Sand Filter in Soil With a Percolation Rate Slower than 60 Minutes per Inch, Unlined Evapotrans-piration System, Outside of Berm of Unlined Wastewater Pond, or System Not Relying on STA for Treatment Other than Aerosol	100	25[(2)]	15	15	10	25	25	15	10
Slit Trench Latrine, Pit Privy	100	50[(2)]	N/A	25	25	25	100	25	N/A
System Not Relying on STA for Treatment and Utilizing Aerosol Methods	100[(3)]	10[(2)]	125	125[(5)]	10	0	25[(3)]	10	10

NOTE: The minimum distances shown on **Table 7-1 must be maintained between the OWTS components and the features described. Where soil, geological or other conditions warrant, greater distances may be required by the Fremont County board of health or by the Water Quality Control Commission pursuant to section 25-8-206, C.R.S. and applicable regulations. For repair or upgrading of existing OWTS where the size of lot precludes adherence to these distances, a repaired OWTS must not be closer to setback features than the existing OWTS, as reviewed and approved by the Fremont County public health agency. Components that are not watertight should not extend into areas of the root system of nearby trees.

1 Includes potable wells, irrigation wells and monitoring wells set within a potable aquifer and infiltration galleries permitted as wells by the Division of Water Resources. All horizontal setbacks to a potable water supply must be met unless a variance by the Board of Examiners of Water Well Construction and Pump Installation Contractors is granted per section 18.2 of the Water Well Construction Rules, 2 CCR 402-2, (Division of Water Resources). Setback requirements which may necessitate a variance are found within section.10.2 or 11.4 of the Water Well Construction Rules, as applicable. The minimum horizontal setback that may be granted for new construction through a variance is to 75 feet; and must meet the requirements of Table 7-2 of this regulation. Setbacks for existing wells must comply with requirements of section 43.10.I.2.

2 Crossings or encroachments may be permitted at the points as noted above provided that the potable water or wastewater conveyance pipe is encased for the minimum setback distance on each side of the crossing. A length of pipe with a minimum Schedule 40 rating [ASTM Standard D3034-24 (2024 version)] of sufficient diameter to easily slide over and completely encase the conveyance must be used. Rigid end caps of at least Schedule 40 rating [ASTM Standard D3034-24 (2024 version)] must be glued or secured in a watertight fashion to the ends of the encasement pipe. A hole of sufficient size to accommodate the pipe must be drilled in the lowest section of the rigid cap so that the conveyance pipe rests on the bottom of the encasement pipe. The area in which the pipe passes through the end caps must be sealed with an approved underground sealant compatible with the piping used. Piping of equal or higher strength may also be used. Other methods of separation between the potable water pipe and a component of the OWTS that provide equal protection are allowed. These may include, but are not limited to, concrete or controlled flowable fill encasement extending no less than 10 feet each side of the crossing, or an impermeable geo-membrane curtain extending at least two feet below the potable water pipe and no less than 10 feet each side of the crossing. These methods must be reviewed and approved by the local public health agency.

3 Add eight feet additional distance for each 100 gallons per day of design flows between 1,000 and 2,000 gallons per day, unless it can be demonstrated by a professional engineer or geologist by a hydrologic analysis or the use of a barrier, consisting of a minimum 30 mil PVC liner or equivalent, that contamination will be minimized. If effluent meets Treatment Level 3N and the Fremont County public health agency has a maintenance oversight program in accordance with section XIV.D. of this regulation, the distance addition is not required. Flows greater than 2,000 gallons per day must be hydrologically analyzed for flow, velocity, hydraulic head, and other pertinent characteristics as means of estimating distances required to minimize contamination as part of the Division site application and permitting process.

4 All horizontal setbacks to an underground potable water supply cistern must be met unless a variance by the Board of Examiners of Water Well Construction and Pump Installation Contractors is granted per section 18.2 of the Water Well Construction Rules, 2 CCR 402-2.Setback requirements which may necessitate a variance are found in section 10.2 or 11.4 of the Water Well Construction Rules, as applicable. The minimum horizontal setback that may be granted through a variance is 25 feet. Noted setbacks are not required to above ground cisterns.

5 If the structure is not used as a habitable unit, the isolation may be reduced by the Fremont County Board of Health to not less than 50 feet.

6 Building sewer installations shall meet the design requirements of the Colorado Plumbing Code.

7. Where ditch companies have a specific right of easement for "reasonable and necessary use to access, operate, and maintain ditches", all OWTS components must maintain a minimum of 25' setback from the crest of the ditch/channel.

8. Sites with multiple OWTS on a single property where the total flows are > 2,000 gpd must meet the increased required setbacks as provided in WQSA-6 (Policy 6).

9. Per 2 CCR 402-10 (6.4.2) Geothermal wells shall be located at least 100 feet to the nearest source or potential source of contamination, unless a variance has been obtained from the state engineer.

10. Setback from a utility easement: While a specific setback for components of an OWTS to a utility easement is not specifically identified, the intent of the regulation is provided herein. The setback from utility easements is dependent on whether the utility is above or below ground. For above ground utilities, components of an OWTS must not be installed in areas where construction or maintenance vehicles may be required to travel in order to gain access to the utility. For utilities installed below grade, the objective is to setback the utility far enough away from the soil treatment area so that sewage will not seep into a utility trench excavation. The setback is also necessary to prevent construction or maintenance vehicles from driving on any component of an OWTS. Where remote properties have a blanket utility easement, the owner/operator of the OWTS will be responsible for providing signage or physical barriers as needed to reduce the risk of vehicular traffic or other disturbance to the OWTS. In all instances, a five foot setback will typically address most concerns.

11. In specific circumstances, the local public health agency may allow for a reduced setback from a property line to the OWTS; per the requirements of section 43.7.D.1.

Table 7-2 Minimum Separation Distance Requirements in Feet from Soil Treatment Area, Relative to Treatment Level Provided[3]

ITEM	OWTS DESIGN CONSIDERATION	Treatment Level 1 and 2	Treatment Level 2N[4]	Treatment Level 3[4]	Treatment Level 3N[4]	Treatment Level 3ND[4]
	Horizontal Separation Distances					
1	Distance from soil treatment area to on-site wells[(5)]	100 feet	100 feet	100 feet	100[(1)] feet	100[(1)] feet
2	Distance from effluent pipes and soil treatment area to pond, creek, lake, or other surface water feature	50 feet	50 feet	50 feet	50 feet	50 feet
3	Distance from soil treatment area to dry gulch or cut bank	25 feet	25 feet	25 feet	25 feet	25 feet
	Vertical Separation Distances					
4A	Treatment depth in feet from infiltrative surface to a limiting layer, or groundwater condition	4 feet	4 feet	4 feet	4 feet	4 feet
4B	Treatment depth in feet from infiltrative surface to a limiting layer, or groundwater condition with the inclusion of an unlined sand filter	4 feet	4 feet	4 feet	4 feet	4 feet

NOTE: Treatment levels are defined in Table 6-3. Fremont County Public Health Agency has not adopted an operation and maintenance oversite program therefore reductions in separation distances with higher level treatment are not allowed.

1. Prior to approval, all setback distance reductions to the 100 foot requirement for wells and soil treatment areas must be in full compliance with the minimum standards and variance requirements of the State of Colorado Division of Water Resources: Rules and Regulations for Water Well Construction, Pump Installation, Cistern Installation, and Monitoring and Observation Hole/Well Construction. Note that the Division of Water Resources does not address inquiries for existing wells. Local agencies must follow the same review principles, as provided within division's guidance document; "Variances for water wells"; March 2019.
2. Reductions in the vertical separation requirements for the use of higher level treatment systems with seepage pits are not allowed. The bottom of the excavation of a seepage pit must be a minimum of four feet above a limiting layer.
3. Refers to the quality of effluent applied to the distribution media
4. Pressure dosing is required for all TL2N, TL3, TL3N, and TL3ND systems
5. Includes potable wells, irrigation wells and monitoring wells set within a potable aquifer and infiltration galleries permitted as wells by the Division of Water Resources.

8. Design Criteria – General

A. Designed Flows:

The OWTS for single-family homes shall be designed to accommodate the proposed flows from the structure as defined in 6.A.2. Flow estimates for multi-family or commercial OWTS must comply with 6.A.4. Expected waste strength as noted in table 6-3 and 6-4 must also be addressed, where applicable. Installation of low flow fixtures or the separation of toilet waste or other sources of wastewater does not allow for the reduction in the size of the OWTS, as provided in section 12.E.

B. Specified Treatment Level:

The OWTS shall be designed and constructed to achieve the treatment level specified by the design.

C. System Functionality:

The OWTS must be designed and constructed such that each component shall function, when installed and operated, in a manner not adversely affected by normal operating conditions including erosion, corrosion, vibration, shock, climatic conditions, and usual household chemicals. Each component must be free of non-functional protrusions or sharp edges, or other hazards, which could cause injury to persons, animals, or properties. Design must be such as to exclude flies and rodents and other vectors and to prevent the creation of nuisances and public health hazards and must provide for efficient operation and maintenance.

1. Spray-type foams that harden are not acceptable as a sealant for OWTS components.

D. Accessibility for Inspection, Maintenance, and Servicing:

1. Septic tanks must have watertight risers over each access manhole. All risers must be a minimum of 20 inches inside diameter and extend to or above final grade, unless otherwise specified in this regulation.

2. For new construction, the top of any septic tank, dosing tank or vault must be no deeper than four feet below finish grade.
3. Each treatment component of an OWTS other than the septic tank and soil treatment area must be equipped with access manholes with risers that extend to or above final grade, located to permit periodic physical inspection, collection and testing of samples and maintenance of all components and compartments.
4. Riser Lids
    a. Each riser lid must be watertight, brought to or above the surface, and must have a secure closing mechanism, such as a lock, special headed bolts or screws, or sufficient weight (defined as 59 pounds) to prevent unauthorized access.
    b. *Access risers for all new septic tanks, seepage pits, or vaults, must include a structurally sound interior grate, or other similar secondary safety feature, securely installed below the tank lid to prevent persons, pets, or wildlife from falling into the tank.*
5. Components that require access for maintenance must be accessible from the ground surface. This includes but not be limited to maintenance of pumps, siphons, valves, distribution boxes, drop boxes, cleanouts, effluent filters, inlet and outlet baffles, aerators, treatment equipment and other devices.
6. Components must be designed and constructed so that, when installed, they must be easily maintained, sampled, and serviced according to the manufacturer's recommendations. Easy physical access to treatment components by maintenance personnel and equipment must be provided.

E. **Plumbing Codes:**

Plumbing fixtures, building sewers, vents, sewer lines and other appurtenances must be designed, operated and maintained so as to comply with the minimum requirements of the most recently revised locally enforceable plumbing code. In absence of a local plumbing code, designs must adhere to the Colorado Plumbing Code (3 CCR 720-1). A local plumbing permit may be required.

F. **Electrical Equipment**: (if used)

1. All electrical work, equipment, and material must comply with the requirements of the currently applicable National Electrical Code as designated by the State Electrical Board Rules and Regulations (3 CCR 710-1). A local electrical permit may be required.
2. Electrical components must be protected from moisture and corrosive gases.

G. **Indicators of Failure or Malfunctioning for Systems Utilizing Mechanical Apparatus:**

A signal device must be installed which will provide a recognizable indication or warning to the user that the system or component is not operating as intended. This indication or warning must be a visual signal and an audible signal and be located in

a centralized area within visual and audible range of the system user. A signal or message may also be sent remotely to a maintenance provider.

H. **Sampling Access:**

1. If sampling for testing or as a requirement for a permit will be required of effluent from a component other than the soil treatment area, an accessible sampling point must be provided.
2. If sampling of the treated wastewater from the soil treatment area will be required for testing or as a requirement for a permit, a monitoring well or wells must be constructed. Monitoring wells must be located down gradient from the soil treatment area, accessible, and provided with a properly securable cover at or above the ground surface. Monitoring wells up gradient of the system may also be required. Lysimeters or other collection devices under the soil treatment area may be used instead of a monitoring well if approved by the Fremont County Public Health Agency or other issuer of a permit.

I. **Component Operating Instructions**:

1. The manufacturer of proprietary treatment units utilizing mechanical components must provide clear, concise written instructions covering the components which, when followed, must assure proper installation and safe and satisfactory operation and maintenance.
2. If the OWTS uses public domain technology, the design engineer must provide clear, concise written instructions covering the components which, when followed, must assure proper installation and safe and satisfactory operation and maintenance.

J. **Surface Activity:**

Activity or use on the surface of the ground over any part of the OWTS must be restricted. The soil treatment must not be subjected to damage or soil compaction from livestock, vehicular traffic, recreational use, or other site development activity. Construction equipment, not necessary to install the OWTS must be kept off of the soil treatment area to prevent undesirable compaction of the soils. If compaction occurs, the disturbed or compacted soil must be re-evaluated and/or new soil evaluations performed. The system must be redesigned if the soil permeability has changed.

K. **Floodplains and Floodways:**

1. A new, expanded or repair/replacement OWTS installed in a 100-year floodplain must meet or exceed the requirements of the Federal Emergency Management Agency and the local emergency agency. Additional requirements are provided below:
    a. OWTS installations in floodplain zones “A” or “V” are considered high-risk areas, Systems installed in these areas must be designed by a licensed Colorado professional engineer.
    b. Repairs of an existing system must meet the requirements as feasible.

c. The system as approved by a Fremont County Public Health Agency must be designed to minimize or eliminate infiltration of floodwaters into the system and discharge from the system into the floodwaters. The OWTS must be located to avoid impairment to floodwaters or contamination from them during flooding.

2. A new or expanded OWTS must not be installed in a floodway designated in a 100-year floodplain where a conforming OWTS outside the floodway can be installed. For any new OWTS or system repair that may affect the floodway delineation, appropriate procedures must be followed including revision of the floodway designation, if necessary.
   a. Fremont County Public Health Agency has elected not to allow any OWTS to be installed within a floodway

L. **Business Commercial, Industrial, Institutional or Multi-Family Dwelling Wastewater Systems:**

1. An OWTS that will serve a business, commercial, industrial or institutional property, or a multifamily dwelling must:
   a. Be designed by a professional engineer;
   b. Receive only such biodegradable wastes for treatment and distribution as are compatible with those biological treatment processes that occur within the septic tank, any additional treatment unit, and the soil treatment area. This does not include industrial, animal, or process waste; and
   c. Receive authorization by rule or a class V underground injection permit from the United States Environmental Protection Agency (EPA) before an application for an OWTS permit is approved if the system may receive non-residential wastewater or is otherwise covered by the EPA underground injection control program. Subsequent to acceptance by the EPA, the Fremont County Health Agency may choose to also issue a permit for this type of use.

9. Design Criteria - Components

A. **Tanks and Vaults:**

1. Water tightness:
   a. Septic tanks, vaults, dosing tanks, other treatment components, risers and lids must not allow infiltration of ground water or surface water and must not allow the release of wastewater or liquids through other than designed openings.
   b. When the final compartment of a tank is being proposed as a pump or siphon chamber, the wall between this chamber and the previous chamber must be watertight except for the intended hydraulic opening.
   c. Acceptable water tightness testing methods performed at a manufacturer's site or in the field includes water filling the tank or vacuum testing.

2. Tank Installation:

All tanks are to be installed level, and placed on a uniform surface or bedding which does not contain rocks, roots or other items that could create a point loading on the tank.

a. If imported bedding is needed, common options include a 5" depth of compacted pea gravel or similar material.

3. Tank Anchoring:

In locations where ground water or floodwaters may cause instability problems to the septic tank, vault, or other treatment unit in the OWTS due to flotation, the tank, vault or unit must be anchored in a manner sufficient to provide stability when the tank is empty. Risers must be included in the buoyancy calculations.

a. If a manufacturer provides recommendations for anchoring designs, they may be used if they meet the conditions present at the site.

b. If a manufacturer does not provide recommendations for provisions to compensate for buoyancy, or if the professional engineer chooses to provide his/her own designs, the anchoring system design must be prepared by the professional engineer.

4. Identification and Data Marking:

All tanks and treatment units must be permanently and legibly marked in a location for the purpose of inspection that is readily visible when inspected before backfilling. The marking inscription must include the following:

a. Name of manufacturer;

b. Model or serial number, if available;

c. Effective volume and unit of measure;

d. Maximum depth of earth cover and external loads the tanks is designed to resist; and

e. Inlet and outlet identifications, if relevant.

B. **Septic Tanks:**

1. The manufacturer must provide sufficient information to demonstrate that the tank will meet the design specification.

2. Sizing Requirements:

a. Sizing for residential capacity for new installations must be based upon the number of bedrooms according to Table 9-1:

Table 9-1 Minimum Septic Tank Size Based on Number of Bedrooms

Number of Bedrooms	**Tank Capacity (gallons)**
2 or 3	1,000
4	1,250
Each Additional	250

b. For multi-family and non-residential applications, a septic tank must be sized to permit detention of incoming wastewater design flows for a minimum of 48 hours.

c. For systems that remove toilet waste for separate treatment, tank capacity may be less than 1,000 gallons, if it provides a minimum of 48 hours detention time.

d. Minimum tank size for new installations other than for a single-family residence is 1000 gallons.

e. Where a grinder pump is installed prior to the septic tank, the required tank volume must be increased by at least 500 gallons above the required volumes provided in Table 9-1.

f. If a proprietary aerobic treatment component is installed, the minimum septic tank (or trash tank) volume may be reduced to the volume as determined by the manufacturer. This volume will typically be provided on the CDPHE product acceptance document, which can be found on the CDPHE OWTS webpage.

3. Inspection and Testing of Septic Tank Watertightness

a. Testing of septic tanks must be performed and evaluated as specified in section 9 of ASTM C1227-22 (2022 version or earlier) (Standard Specification for Precast Septic Tanks) for concrete tanks or in Standard IAPMO/ANSI Z1000 (2019 version) (American Standards for Prefabricated Septic Tanks) for other prefabricated septic tanks.

b. Each unit must be inspected in the field for conditions that may compromise its water tightness.

c. The inspection in the field must be conducted by the Fremont County Public Health Agency and be performed after the tank installation but before backfilling.

d. If the inspection in the field indicates that the tank may be damaged or is not watertight, the inspector may require that the tank be tested for water tightness by the tank manufacturer or the system contractor.

4. Septic Tank Design and Dimension Criteria

a. A septic tank must have two or more compartments, or more than one tank may be used in series, unless otherwise noted in this regulation. The first compartment of a two-compartment tank or the first tank in a series must hold no less than one-half of the required effective volume.

b. Inlet invert must be at least two inches higher than the outlet invert.

c. Inlet tee or baffle must extend above the surface of the liquid at least five inches and must extend to a minimum of eight inches below the liquid surface. However, the inlet tee or baffle must not extend to a depth of more than 40 percent of the liquid depth measured from the liquid surface.

d. Outlet tee or baffle must extend at least five inches above and fourteen inches below the outlet invert, however it must not extend more than 40 percent of the liquid depth measured from the liquid surface. The outlet tee or baffle that accommodates an effluent filter must be located so that the effluent filter has sufficient clearance to be removed through the access opening with a riser in place.

e. The distance from the outlet invert to the underside of the tank top must be at least ten inches.

f. Liquid depth must be a minimum of 30 inches, and the maximum depth must not exceed the tank length.

g. The transfer of liquid from the first compartment to the second or successive compartment must be made at a liquid depth of between 35 and 40 percent of the liquid depth measured from the liquid surface.

h. At least one access opening no less than 20 inches across must be provided in each compartment of a septic tank.

i. A septic tank must have a minimum of 25 square feet of liquid surface area and have at least a six-foot separation between inlets and outlets. Septic tanks in series, combined, must have a minimum of 25 square feet of liquid surface area and the sum of the distances between inlets and outlets of all tanks must be at least six feet. The requirements for liquid surface area and separation between inlet and outlet may be waived for tanks with less than 750 gallon effective volume.

j. Tanks proposed to be below vehicular traffic areas must have the appropriate AASHTO H-20 or HS-20 ratings for such use.

5. Concrete Septic Tank Structural Design

a. Concrete septic tanks must comply with the structural design criteria of ASTM C1227-22 (2022 version) (Standard Specification for Precast Septic Tanks).

b. The design for each tank model and size by each manufacturer must be certified by a professional engineer as complying with these design and structural requirements and the water tightness standard of this regulation.

c. Certification by a professional engineer must be submitted to the Division for acceptance.

d. Tank slab lids, mid-seam tanks, and the connection between the tank and risers must be designed to provide a watertight seal.

6. Fiberglass, Fiberglass-Reinforced Polyester, and Plastic Tanks

a. All fiberglass, fiberglass-reinforced polyester, and plastic tanks must meet the minimum design and structural criteria of IAPMO/ANSI Z1000 (2019 version) (American Standards for Prefabricated Septic Tanks) and be certified by a professional engineer as meeting these standards. The professional engineer certifying the criteria must be

registered or licensed in the United States, but need not be registered in Colorado.

b. All tanks must be sold and delivered by the manufacturer or manufacturer's designated representative, preferably completely assembled. On-site tank assembly will be allowed on an as-needed basis.

c. Tanks must be structurally sound and support external forces as specified in the standard referenced above when empty and internal forces when full. Tanks must not deform or creep resulting in deflection of more than five percent in shape as a result of loads imposed.

d. All tanks must be constructed of sound, durable materials and not be subject to excessive corrosion, decay, frost damage, or cracking.

e. All seams or connections including risers must be sealed to be watertight.

7. Metal tanks are prohibited.

C. **Abandonment of Tank:**

1. A tank may be completely removed and the parts disposed of safely.
2. If the tank will remain in place:
   a. The tank must be pumped to remove as much waste as possible;
   b. The bottom of the tank must be broken so the tank neither floats nor fills with water;
   c. The top must be collapsed, and the sides may be broken into the void;
   d. The remaining void must be filled with gravel, sand or compacted soil; and
   e. The filled excavation will be graded to surroundings, allowing for settling.
   f. An abandonment form supplied by the Fremont County Public Health Agency shall be signed by the contractor or owner and notarized verifying the above requirements have been met.
3. The Fremont County Public Health Agency may require abandonment of a tank that is deemed to be a hazard.

D. **Pipe Standards and Bedding Requirements:**

1. Pipe Standards
   a. All wastewater pipes used in portions of an OWTS that are pressurized must be constructed of compatible pipe, primer, bonding agent, and fittings. Flexible couplings to connect pipes may only be used in portions of an OWTS that are intended for gravity flow of wastewater.
   b. Where un-perforated plastic pipes and fittings are used for gravity flow, the minimum wall thickness of the pipe must conform to ASTM Standard D 3034-21 (2021 version) or equivalent or greater strength. Schedule 40 pipe is preferred.

c. Perforated distribution pipe surrounded by rock within a soil treatment area must have a minimum wall thickness and perforations conforming to ASTM Standard D 2729-21 (2021 version or equivalent or greater strength. Corrugated polyethylene pipe with a smooth interior that meets ASTM F667 / F667M (2021 version) or AASHTO M252-24 (2024 Version) specifications or equivalent may be used.

d. Schedule 40 [ASTM Standard D3034-24 (2024 version)]or pipe of equivalent or greater strength must be used where pipe is installed in the following locations:

(1) Under driveways, roadways, or other areas where vehicular traffic is expected. Properly compacted select bedding material must be installed in such case. Additional frost protection, such as installing 2" foam board or double-encasement of the pipe, is recommended.

(2) Five feet prior and beyond all tanks; and

(3) In instances where sewer line setback distances are granted a variance for any reason.

e. Tile pipe, open-joint pipe, and cast iron pipe must not be used in an OWTS.

f. Pressure pipe must be rated for the intended use to accommodate pump discharge pressure. Cellular (foam) core piping must not be used in pressurized systems.

g. The building sewer will be installed with a slope of not less than 1/8 inch per foot and not greater than 1/4 inch per foot.

2. Bedding:

a. All system piping, except for distribution laterals within the soil treatment area, must be bedded with select material before final inspection by the Fremont County Public Health Agency. Select bedding material must consist of loose, granular material, free from stones, clods, frozen soil, or other deleterious material. Select material may consist of on-site job-excavated or imported material. Bedding material must be mechanically compacted to support piping.

E. **Cleanouts required between the building and the septic tank:**

1. Cleanouts must have a secure cap and a riser extending to or easily accessible from grade. The installation of a straight tee or a sanitary tee is acceptable.

2. If a cleanout is not already provided outside of the building, a two-way cleanout, no smaller than the building sewer, must be installed within five feet of the building or the closest feasible area between the building and the septic tank, but not to exceed 50 feet.

a. For long runs of piping, building sewers must have a cleanout installed at intervals of not more than 100 feet.

3. Where a sewer has a change of horizontal direction greater than 45 degrees, a cleanout must be installed at the change of direction unless a cleanout already exist within 50 feet upstream of this fitting. Where more than one change of direction greater than 45 degrees occurs within 50 feet of a developed length of pipe, the cleanout for the first change of direction may serve as the cleanout for all changes within that 50 feet of developed length of pipe.

F. **Distribution Box:**

A distribution box, if used, must be of sufficient size to distribute effluent equally to the laterals of a trench or absorption bed system. The box must be constructed with the inlet invert at least one inch above the level of the outlet inverts. Flow equalizers or similar devices must be used to adjust the flow between laterals. Access to the box must be provided with a manhole riser with access lid at or above grade if the top of the box does not reach final grade.

G. **Drop Box:**

In sequential distribution, a watertight box may be used to transfer the effluent to the following trench when the effluent in a trench has received the designed level for overflow to the next trench. A drop box shall have a riser at or above final grade, if the top of the drop box does not reach final grade. Outlet pipes in sequential distribution must be designed and installed so that they may be capped off for resting periods.

H. **Step-down/Relief Pipe:**

In sequential distribution, an un-perforated pipe may be used to transfer the effluent to the following trench when the effluent in a trench has received the designed level for overflow from that trench.

I. **Wastewater Pumping and Dosing Siphon Systems:**

1. Pumps
    a. Non-clog pump opening must have at least two-inch diameter solids handling capacity where raw wastewater is pumped. A pump opening must not have more than 3/4-inch diameter solids handling capacity if previously settled effluent is pumped.
    b. Pumps must be certified to the applicable UL or CSA electrical safety standard, bear the seal of approval of CSA, UL or an equivalent testing program and be constructed of corrosion resistant materials.
    c. Grinder pumps must also be certified to NSF/ANSI Standard 46 (2022 or earlier version) and bear the seal of approval of the NSF or equivalent testing and certification program.
        (1) Where a grinder pump is used prior to the septic tank, an effluent filter is required to be installed on the outlet of the septic tank. Additional tank requirements are provided in section 9.B.2.e.
        (2) Where a grinder pump is used prior to the septic tank, the effluent pipe from the grinder pump must be connected to the sewer line prior to the inlet of the septic tank.

2. Floats and Switches
    a. Automatic liquid level controls must be provided to start and shut off pumps at a frequency or level specified in the design.
    b. Floats must be mounted on a stem separate from the pump discharge piping to allow for removal, adjustment, and replacement of the float from grade without removing the pump. Components to hold the floats must be securely attached and of a material that is resistant to corrosion and will not absorb water.
    c. Float switches must be certified to the applicable UL60947-4-1 (Edition 4 or earlier version), or CSA C22.2 No. 205-17 (2017 or earlier version) electrical safety standards, bear the seal of approval of CSA, UL or an equivalent certification program and be constructed of corrosion resistant materials.
    d. Dosing siphons for pressure dosing and higher level treatment systems must provide for a means of determining the number of dosing events.
3. Location of Pump or Siphon
    a. A pump, or a siphon may be installed in a separate tank following the septic tank. The tank must be of sufficient volume to allow pump or siphon cycling commensurate with the design capacity.
    b. The second compartment of a two compartment septic tank may only be used as the pump tank when the tank is specifically designed for this purpose, and it can be demonstrated to the satisfaction of the Fremont County Public Health Agency that the minimum 48-hour detention time will not be decreased. The pump must be screened to remove solids greater than 1/8 " assuring that only liquid effluent will be discharged. The transfer of liquid from the first to the second compartment must be at an elevation that is between the inlet and the outlet invert elevations, and through a standard tee designed and located as per the requirements of section 9.B.4.d. Siphons must not be installed in the second compartment of a two compartment tank.
    c. The use of a three-compartment septic tank, sized to provide the required effective volume in the first two compartments with the pump or siphon in the third compartment is acceptable for tanks specifically designed for this purpose. The transfer of liquid from the second to the third compartment must be at an elevation that is between the inlet and outlet invert elevation, and through a standard tee designed and located as per the requirements of section 9.B.4.d.
4. Pump or Siphon Discharge Piping
    a. The discharge pipe from the pumping or siphon chamber must be protected from freezing by burying the pipe below frost level or sloping the pipe to allow it to be self-draining. Drainage must be provided

through the bottom of the pump or through a weep hole located in the discharge pipe prior to the existing the tank.

b. The pump discharge piping must have a quick disconnect that is accessible from grade to allow for easy pump access and removal.

c. The pipe must be sized to maintain a velocity of two or more feet per second.

d. Pressure pipes must be designed to prevent air or vacuum locking and allow self-draining of the pipes.

5. Access

a. The pump or dosing system tank, chamber, or compartment must have a minimum 24-inch nominal diameter access riser, made of corrosion-resistant material, extending to or above ground level. A small diameter riser may only be installed if it is accepted by the division as an integral component of a specific product during the product review process.

b. The access riser must have a watertight connection to the pump or dosing chamber/compartment to prevent infiltration or exfiltration. All other intrusions to the riser for electrical or other component access must also be watertight.

6. Splice Box (Junction box)

a. Splice boxes must be located outside the pump system access riser and be accessible from the ground surface.

b. Wire splices are prohibited inside the tank, dosing chamber or riser. Wire splicing must be completed with corrosion-resistant, watertight connectors.

7. Controls

a. Control panels or electrical boxes used to control the functions of an OWTS must comply with the following, as appropriate:

(1) The pump system must have an audible and visual alarm notification in the event an excessively high water condition occurs.

(2) The pump must be connected to a control breaker separate from the alarm breaker and from any other control system circuits.

(3) An electrical disconnect must be provided within the line of sight of the pump chamber.

(4) The pump system must be provided with a means that will allow the pump to be manually operated, such as an H.O.A. switch (Hand/Off/Auto).

(5) The pump system for pressure dosing and higher level treatment systems must have a mechanism for tracking both the amount of time the pump runs and the number of cycles the pump operates.

(6) Must bear the seal indicating acceptable product testing from a U.S. Department of Labor, Occupational Safety and Health Administration

Nationally Recognized Testing Laboratory (NRTL) (https://www.osha.gov/dts/otpca/nrt//nrtllist.html), such as UL or ETL.

(7) The bottom of the control panel must be at least 30 inches above grade. An electrical permit shall be required for the installation of electrical components and wiring.

J. **Effluent Filters:**

1. The Fremont County Public Health Agency has elected not to require effluent filters to be installed in septic tanks in new installations and repairs where the septic tank is replaced. However, effluent filters may be used.
2. When effluent filters are required, the septic tank outlet, or the outlet of the last septic tank in series, must include an effluent filter that retains solids greater that one-eighth in size. Effluent filters must be sized to meet the estimated daily design flow and waste strength.
3. If a pump is used to remove septic tank effluent from the final compartment of the septic tank, the effluent must be filtered prior to dispersal into the soil treatment area. An effluent filter, pump vault equipped with a filter cartridge, or a filter on the discharge pipe, would all be considered acceptable.
4. The effluent filter must be cleaned at manufacturer-recommended intervals, or more often, if use patterns indicate.
5. An alarm may be installed on an effluent filter indicating need for maintenance. The Fremont County Public Health Agency may require all effluent filters to be equipped with alarms.
6. Where an ejector pump, grinder pump or non-clog pump is proposed for the use prior to the septic tank, an effluent filter must be installed on the outlet of the septic tank.
7. The handle of the effluent filter must extend to within 12 inches of grade.

K. **Grease Interceptor Tanks:**

1. All commercial food service facilities and other facilities generating fats, oils and greases in their waste must install a grease interceptor tank.
2. Grease interceptor tanks shall treat only those portions of the total wastewater flow in which grease and oils are generated.
3. The grease interceptor must have a minimum of two compartments and must be sized proportionately to the amount of fats, oils and grease it receives, the peak flow rate through the tank, and the expected cleaning frequency.
4. The inlet and outlet tees or baffles must extend into the bottom 1/3 of the liquid volume, but must be at least 12 inches off the inside floor of the interceptor.
5. The inlet and outlet tees or baffles must extend at least 5 inches above the liquid level and must provide for a free vent are across the liquid surface.

10. Design Criteria– Soil Treatment Area

A. **Size and Design:**

The size and design of the soil treatment area must be based on the results of the site and soil evaluation, design criteria, and construction standards for the proposed site and OWTS selected.

B. **Conditions Requiring Professional Engineer:**

At proposed soil treatment area locations receiving domestic wastewater, where any of the following conditions are present, the OWTS must be designed by a professional engineer and approved by the Fremont County Public Health agency:

1. For OWTS installed in soil types, 3A, 4, 4A, 5, FBR, DBR, R-0, R-1, R-2, and R-3 as specified in Table 10-1 and 10-1A of this regulation;
2. For OWTS that include components which provide Treatment Levels TL2, TL2N, TL3, TL3N and TL3ND effluent; or an NDDS;
3. The maximum seasonal level of the ground water surface is less than four feet below the bottom of the proposed infiltrative surface;
4. Where a limiting layer, restrictive layer, or groundwater condition exists less than four feet below the bottom of the proposed infiltrative surface;
5. In floodplains or floodways, as required in section 8.K
6. The ground slope is in excess of thirty percent; or
7. Pressure distribution is used; or
8. OWTS for business, commercial, industrial, institutional use, or multi-family dwellings.

C. **Calculation of Infiltrative Surface of Soil Treatment Area:**

1. The infiltrative surface of a trench or bed receiving any treatment level of effluent is only the bottom area. No sidewall credit is allowed except in deep gravel trenches and seepage pits that are permissible in repairs. (see section 10.I.5 and 10.I.6).
2. Long-term acceptance rates (LTARs) are shown in Table 10-1 and 10-1A.
3. Factors for adjusting the size of the soil treatment area are in Tables 10-2 and 10-3.
4. The required area for a soil treatment area is determined by the following formula:

$$\text{Soil Treatment Area in square feet required} = \frac{\text{Design Flow (in gallons per day)}}{\text{LTAR (in gallons per day per square foot)}}$$

   a. Adjusted Soil Treatment Area = Required Soil Treatment Area x Size Adjustment Factor(s).
   b. Size adjustment factors for methods of application are in Table 10-2.
   c. Size adjustment factors for types of distribution media are in Table 10-3.

d. A soil treatment area receiving TL1 effluent may be multiplied by the size adjustment factors within Table 10-2 and Table 10-3.

e. The distribution media options within Table 10-3 may be used for distribution of higher level treatment system effluent (TL2 – TL3ND), however, the size reduction factors within Table 10-3 must not be used. Sizing reductions for higher level treatment systems are achieved through increased LTAR's provided in Table 10-1 and may only be used in locations where the local public health agency implements a maintenance oversight program as defined in section 43.14.D.

5. A soil treatment areas receiving TL2, TL2N, TL3, TL3N orTL3ND effluent must be pressure dosed.

   a. For Products that combine distribution and higher lever treatment within the same component, pressure distribution of the effluent over the soil treatment must be used.

   b. TL2 TL3ND effluent may be applied by gravity flow in soil types 3, 3A, or 4, for designs where reductions in the soil treatment area size or vertical/horizontal separation reductions are not being requested.

Table 10-1 Soil Treatment Area Long-term Acceptance Rates by Soil Texture, Soil Structure, Percolation Rate and Treatment Level

Soil Type, Texture, Structure and Percolation Rate Range					Long-term Acceptance Rate (LTAR); Gallons per day per square foot[2]
Soil Type	**USDA Soil Texture**	**USDA Soil Structure-type**	**USDA Soil Structure-Grade**	**Percolation Rate (MPI)**	**Treatment Level 1[1]**
R	>35% Rock (<2mm), or Fractured or Deteriorated Bedrock:				SEE TABLE 10-1A
1	Sand, Loamy Sand	Single Grain	0 (Structureless)	5-15	0.80
2	Sandy Loam, Loam, Silt Loam	PR (Prismatic) BK (Blocky) GR (Granular)	2 (Moderate) 3 (Strong)	16-25	0.60
2A	Sandy Loam, Loam, Silt Loam	PR, BK, GR Massive	1 (Weak) (Structureless)	26-40	0.50
3	Sandy Clay Loam, Clay Loam, Silty Clay Loam	PR, BK, GR	2, 3	41-60	0.35
3A	Sandy Clay Loam, Clay Loam, Silty Clay Loam	PR, BK, GR Massive	1 (Structureless)	61-75	0.30
4	Sandy Clay, Clay, Silty Clay	PR, BK, GR	2, 3	76-90	0.20
4A	Sandy Clay, Clay, Silty Clay	PR, BK, GR Massive	1 (Structureless)	91-120	0.15
5	Soil Types 2-4A	Platy	1, 2, 3	121+	0.10

NOTE: Shaded areas require system design by a professional engineer.

1 Treatment levels are defined in Table 6-3.

2 The determination of long-term acceptance rates must also include an evaluation of soil consistence (identification of "cementation class"). Refer to the Rupture Resistance chart, Table 5-1, in section 43.5.D. Moderately to Very strongly cemented soils will typically have characteristics

of Type 3A or 4A soils. Long term acceptance rates should be reduced to coincide with the expected permeabilities.

3 Soil types 4A and 5 will require the effluent to be dispersed via pressure distribution, with a minimum of two alternately dosed zones.

- Higher long-term acceptance rates for Treatment Level 3N may be allowed for OWTS required to have a discharge permit, if the capability of the design to achieve a higher long-term acceptance rate can be substantiated.

Table 10-1A[1] Design Criteria for Soils with High Rock Content (Type "R" Soils) [2,5,6]

Soil Matrix Type, Percent of Rock, Size of Rock, Excavation Difficulty, and Soil Permeability [3]				Required Sand Depth Relative to the Quality of Effluent Applied to the Distribution Cell [7]
Soil Type[1]	**Soil Matrix Type, Percentage of Rock and Size of Rock [3, 4]**	**Excavation Difficulty [1]**	**Soil Permeability; Minutes Per Inch (MPI) [1, 2]**	**Treatment Level 1 [7, 8]**
FBR	In-situ Fractured Bedrock (FBR)	Low Moderate High Very High Extremely High	0 - > 90 Usually rapid in highly fractured bedrock.	Minimum 3-foot deep unlined Sand Filter
DBR	In-situ Deteriorated Bedrock (DBR)	Low Moderate High	41 - > 90 Typically, slower than the material textures	Minimum 2-foot deep unlined Sand Filter
R-0	Soil Type [3] 1 (sand loamy sand) where more than 35% Rock is greater than 2 mm in size (>2mm)	Low- Tile spade with arm pressure.	0 to 15	Minimum 3-foot deep unlined Sand Filter
R-1	Soil Type[3] 2 – 4, with 35 - 65% Rock	Low - Tile spade with arm pressure,	16 to 90 Varies relative to	Minimum 2-foot deep unlined

	(>2mm) ; where 50% of the Rock is less than 20 mm (3/4 inch) in size	To, Moderate – Tile spade with foot pressure.	soil type and cementation class.	Sand Filter
R-2	Soil Type[3] 2 - 4, more than 65% Rock (>2mm); OR contains 35 – 65% rock (>2mm),where 50% or more of the rock is more than 20 mm (3/4 inch)	Low - Tile spade with arm pressure, To, Moderate – Tile spade with foot pressure.	16 to 90 Varies relative to soil type and cementation class.	Minimum 3-foot deep unlined Sand Filter
R-3	Soil Type[3] 2 – 4 (Loam, Clay Loam, Clay) With 65% or more Of the rock Is greater than >2mm OR Soil Type[3] 4A and 5 (Structureless clay, or other Platy Structured Soil) with more than 35% rock.	High – Tile spade is difficult, pick using over-the-head swing is easy. Very High – Pick with over-the-head swing is moderate to markedly difficult. Extremely High – Pick with over-the-head swing is nearly impossible	Greater than 90 Soil Type[3] 2 – 4 (Loam, Clay Loam, Clay) More than 65% of the Rock is greater than 2mm in size. OR 50% or more of the Rock is greater than 20mm (3/4 inch) in size.	Minimum 3 – foot deep unlined sand filter

1. General guidance for Table 10 – 1A;
    a. FBR: Fractured Bedrock – As this category encompasses a variety of site conditions where the percentage of rock, excavation difficulty, and permeability may vary substantially, all information must be used by the design engineer to determine the proper long term acceptance rate. Table 10-1B provides guidance for this determination.
    b. DBR: Deteriorated Bedrock – As this category encompasses a variety of site conditions where the percentage of rock, excavation difficulty, and permeability may vary substantially, all information must be used by the design engineer to determine the proper long term acceptance rate. Table 10-1C provides criteria for this determination.

c. Soil Type R-0 is a limiting layer due to rapid permeability and a high rock content that provides limited surface area for adequate treatment.
d. Soil Type R-2 and R-3 are restrictive layers due to reduced permeability and/or a high rock content, each providing a limited surface area for adequate treatment. In many cases, the only difference between an R-2 and R-2 soil type will be the "excavation difficulty "and/ or soil permeability.
e. An OWTS installed in "Type R Soils" must disperse effluent through an unlind sand filter, unless one of the following conditions are met:
   i) Treatment level 3ND is attained and the requirements of 12.F are met.
   ii) Site conditions are determined to be a soil Type DBR, or R-1, and the Treatment Level 3 or 3N effluent is attained prior to dispersal to the soil treatment area.
f. "Excavation Difficulty" is provided in Table 10-1C.

2. Provisions for determining the long-term acceptance rates for soils reference in this chart are provided in section 11.C.3. The design of systems in type "R" soils must conform to the requirements of sections 11.C.2 and 3.
3. The "Soil Matrix Type, Percentage and Size of Rock" column references the soil types described in Table 10-1.
4. The percentage of rock may be determined by a gradation conducted per ASTM standard D6913-17 (2017. Version), or a visual determination as per pgs. 7-1 through 7-9 of the NRCS Field Book, Version 3, 2021 reprint.
5. All systems installed in a type "R" Soil must be designed by a Colorado licensed professional engineer.
6. Pressure distribution is required for all "R" Soil Types and shall comply with the requirements of section 10.E.3.
7. Minimum imported sand depths are provided in this table. NOTE HOWEVER THAT AN ADDITIONAL VERTICAL SEPARATION ABOVE A LIMITING LAYER OR GROUNDWATER CONDITION MAY BE NECESSARY TO MEET THE REQUIREMENTS OF TABLE 7-2.
8. Type "R" soil treatment systems that are designed per the criteria noted in the Treatment Level 1 column of this table do not require operation and maintenance oversight by the local public health agency.

Table 10-1B: Fractured Bedrock (FBR), LTAR Guidance

Table 10-1B is intended to provide guidance to the design engineer in determining the appropriate LTAR for the soil treatment area. Fractured bedrock formations typically consist of many variables, resulting in a wide range of permeabilities. The design engineer should take all factors into consideration before identifying a specific LTAR for each site. In certain instances, percolation tests may be necessary to more accurately identify the appropriate LTAR.

*Describes the dominant (average) horizontal spacing between vertical joints (geogenic cracks or seams) in the bedrock layer.

Reference: NRCS Field Book for Describing and Sampling Soils, Version 3.0; 2021 Reprint; Geology section, pg. 1-24. Note: The LTAR identified in this table is not included in the NRCS Field Book.

FBR: Distance between fractures*	Code	**LTAR**
<4 inches	1	Soil Type 1
4 to <18 inches	2	Soil Type 1
18 to <40 inches	3	Soil Type 2
40 to <80 inches	4	Soil Type 3
≥ 80 inches	5	Soil Type 4

Table 10-1C: LTAR Determination for Deterioration

Excavation Difficulty: The relative force or energy required to excavate the soil / rock.

Class	Criteria
Low	Excavation by tile spade requires arm pressure only; Impact energy or foot pressure is not needed
Moderate	Excavation by tile spade requires impact or foot energy; Arm pressure is insufficient
High	Excavation by tile spade is difficult but, easily done by pick using over-the-head swing
Very High	Excavation by pick with overhead swing is moderately to markedly difficult. Backhoe excavation by 50 – 80 hp tractor CAN be made in moderate time.
Extremely High	Excavation by pick is nearly impossible. Backhoe excavation by 50 – 80hp tractor CANNOT be made in a reasonable time

NOTE: Depending on the "Excavation Difficulty" in a DBR soil, the proposed LTAR must increase by the following:

- One soil type for "Moderate"
- Two soil types for "High"
- Three soil types for "Very High" or "Extremely High"

Excavation difficulty is from the soil type of the observed soil texture, with a maximum soil type of 5 LTAR. (Soil types are provided in table 10-1)

D. **Allowable Soil Treatment Area Sizing Adjustments**

1. The soil treatment area size determined by dividing the design flow rate by the long-term acceptance rate may be adjusted by factors for method of treatment, soil treatment area design, and type of distribution media.
2. For the purpose of Table 10-1, a "baseline system," i.e. adjustment factor of 1.00, is considered to be Treatment Level 1 (TL1) applied by gravity to a gravel-filled trench.
3. Sizing adjustments are not allowed for systems placed in type "R" soils. The maximum LTAR's are provided in section 11.C.3.b.
4. Long term acceptance rates for use of the higher level treatment categories listed in Table 10-1 will only apply provided the system is inspected and maintained as specified in the requirements of section XIV.D, Permitting and Oversight of Maintenance for Soil Treatment Area Reductions and Vertical and Horizontal Separation Distance Reductions Based on Use of Higher Level Treatment.

Table 10-2 Size Adjustment Factors for Methods of Application in Soil Treatment Areas Receiving Treatment Levels 1, 2, 2N, 3, 3N and 3ND Effluent

Type of Soil Treatment Area	Method of Effluent Application from Treatment Unit Preceding Soil Treatment Area		
	Gravity	Dosed (Siphon or Pump)	Pressure Dosed
Trench	1.0	0.9	0.8
Bed	1.2	1.1	1.0

Table 10-3 Size Adjustment Factors for Types of Distribution Media in Soil Treatment Areas for Receiving Treatment Level 1 Effluent

Type of Soil Treatment Area	Type of Distribution Media Used in Soil Treatment Area[1]		
	Category 1	Category 2	Category 3
	Rock or Tire Chips	Other Manufactured Media	Chambers or Enhanced Manufactured Media
Trench or Bed	1.0	0.9	0.7
Trench or Bed: Soil Types 4A - 5	1.2	1.1	1.0

1. All Proprietary distribution products must receive acceptance and the applicable size adjustments through the Division review per the applicable requirements of section 13.

E. Design of Distribution Systems:

1. General:

a. The infiltrative surface and distribution laterals must be level.

b. The infiltrative surface must be no deeper than four feet below grade unless TL2 or higher effluent is applied to the distribution media, and the system is inspected and maintained as specified in the requirements of section XIV.D. The depth of the infiltrative surface will be measured on the up-slope side of the trench or bed.

c. Where a conforming soil treatment area is reasonably accessible, the soil treatment area must not be placed below a paved surface, or an area where vehicular traffic occurs or is expected. If a compliant site for the soil treatment area cannot be identified, it may be placed below a paved surface when all of the following conditions are met:
   (1) The effluent must be treated to TL2 or higher prior to the effluent being applied to the distribution media.
   (2) The distribution system must be designed to accommodate the vehicular loading.
   (3) Size adjustment factors identified in Table 10-3 must not be applied.

d. Trenches must follow the ground surface contours so variations in infiltrative surface depth are minimized. Beds must be oriented along contours to the degree possible.

e. Pipe for gravity distribution must be no less than three inches in diameter.

f. A final cover of soil suitable for vegetation at least ten inches deep must be placed from the top of the geotextile or similar pervious material in a rock and pipe system, chamber, or manufactured media up to the final surface grade of the soil treatment area. The backfill material must be void of cobbles, boulders, building debris, or other non-permeable material. The preferred soil cover is a sandy loam textured material, topped with two – three inches of topsoil.

g. Following construction, the ground surface must be graded to divert storm water runoff or other outside water from the soil treatment area. The area must be protected against erosion. Subsurface drains upslope of the soil treatment area may be installed to divert subsurface flow around the area.

h. Backfilling and compaction of soil treatment areas must be accomplished in a manner that does not impair the intended function and performance of the storage/distribution media and soil, and distribution laterals, allows for the establishment of vegetative cover, minimizes settlement and maintains proper drainage.

i. Dosing may be used for soil treatment area distribution. The dose must be sized to account for the daily flow and the dosing frequency.

2. **Distribution Laterals:** **Must meet the requirements of section 9.D as applicable.**

a. Distribution between laterals in a soil treatment area must be as level as possible. Uneven settling of portions of the distribution system following construction must be addressed by provisions in the design to adjust flows between laterals.

b. The Fremont County Public Health Agency has limited the length of distribution laterals to a maximum of 100 feet.

c. For absorption beds, the separating distance between parallel gravity distribution laterals must not exceed six feet (center-to-center), and a distribution lateral must be located within three feet of each sidewall and end-wall.

d. The end of a distribution pipe must be capped, unless it is in bed or trenches in a level soil treatment area, where the ends of the pipes may be looped.

e. To promote equal distribution to the soil treatment area, the effluent pipe on a gravity flow system must be connected to as near to the middle of the distribution header as possible. However, it must be offset from any distribution lateral so as to not provide a direct pathway into a single lateral.

Note: The installation of a distribution box with flow levelers is preferred, as this will further assist in better distribution of the effluent.

f. Orifices must be oriented downward unless pressure distribution is used and provision for pipe drainage is included.

3. **Pressure Distribution:**

a. Design plans for pressure distribution systems must identify the exact specifications for the following items:

(1) General Design Parameters: Not all combinations of the variables noted below will result in a proper distribution system design. The design engineer must justify through calculations &/or design software that the selected values will concur with the requirements noted below.

(i) Distribution pipe size: ¾ inch – 1.5 inches (PVC Class 200, min.). 2-inch distribution pipe may only be used where other design modifications cannot overcome a greater than 10% variation in the pressure head between the initial and distal orifices.

(ii) Distribution pipe spacing: 18 inches – 48 inches

(iii) Orifice size: 1/8 inches – 3/8 inches

(iv) Orifice spacing 18 inches – 48 inches

(v) Proposed dose volume: Will vary with design (0.25 – 1.0) gallons / Orifice / dose, oe 3 – 5 times distribution pipe volume

(vi) To promote equal distribution within the soil treatment area, the forcemain within a pressure distribution system must be connected to as near to the middle of the distribution header as possible. This connection must be offset from any distribution lateral to prevent preferential flow to a single lateral. An allowable alternative to this configuration is provided below:

(a) Connections to the end of the distribution header are only allowed for soil treatment areas having a width of 12 feet or less, and minimum 2 inch diameter manifold is required.

(vii) Operating head at the distal end of distribution pipes:

(a) For systems with orifices 5/32 inch or less, the minimum squirt height is five feet

(b) For systems with orifices 3/16 or greater, the minimum squirt height must be at least 12 inches above final grade, but never less than 30 inches above the lateral invert.

(c) As part of the final inspection of an OWTS installation with pressure distribution, a residual head test (squirt height), at the distal end of each lateral, must be conducted to determine the adequacy of system design and construction. Results from this inspection must be included within both the engineer's certification and the final permit acceptance document

(2) Pump/siphon information; Total Dynamic Head; gallons/minute; and,

(3) Drain-back Volume from forcemain, when applicable

(7) Calculations, or a design software reference, that indicates the selected component sizing will provide equal flow within each active zone of the distribution system, and provide no more than 10% flow differential from the initial orifice to the most distal end orifice within each zone.

b. The separating distance between parallel distribution pipes in a pressure distribution absorption bed must not exceed four feet, and the outer pipe must be located within two feet of each sidewall and endwall. Additional requirements for the design of sand filters are noted in sections 11.C.2. and 3.

c. Flushing assemblies must be installed at each distal end of each lateral and be accessible from finish grade. A sweeping 90 degree or bends limited to a 45 degree are suggested.

d. Effluent must be screened to retain solids 1/8" or greater prior to dosing a pressure distribution system. An effluent filter may be installed at the tank outlet, or within a screened pump vault. The filter may also be installed within the discharge line, inside the pump chamber.

F. Soil Treatment Area Requirements:

1. **Trenches:**
   a. Trenches must be three feet wide or less.
   b. The separating distance between trenches must be a minimum of four feet sidewall-to-sidewall.
   c. Distribution laterals used in a trench must be as close to the center of the trench as possible.
2. **Beds:**
   a. Maximum width for a bed must be 12 feet, unless the bed receives effluent meeting Treatment Level 2 quality or better.
   b. The separating distance between beds must be a minimum of six feet sidewall-to-sidewall.
3. **Serial and Sequential Distribution:**
   a. New serial distribution systems, where the effluent must pass through the first trench in order to access subsequent trenches, are prohibited.
   b. A sequential distribution system may be used where the ground slope does not allow suitable installation of a single level soil treatment area unless a distribution box or dosing chamber is used.
   c. The horizontal distance from the side of the absorption system to the surface of the ground on a slope must be adequate to prevent lateral flow and surfacing.
   d. Adjacent trenches or beds must be connected with a stepdown/relief pipe or a drop box arrangement such that each trench fills with effluent near the top of the gravel or chamber outlet before flowing to succeeding treatment areas. Note that in a sequential distribution configuration, effluent does not pass through the first trench before it enters subsequent trenches.
4. **Alternating Systems:**
   a. An alternating system must have two zones that must be alternated on an annual or more frequent basis.
   b. For repairs, each section must be a minimum of 50 percent of the total required soil treatment area. For new installations, each soil treatment area must meet the minimum sizing requirements of this regulation.
   c. A diversion valve or other approved diversion mechanism that requires the owner or operator to manually alternate zones of the OWTS may be installed on the septic tank effluent line allowing soil treatment area sections to be alternated.
   d. The diversion mechanism must be readily accessible from the finished grade.

5. **Sequencing Zone Systems:**
    a. Sequencing zone systems have more than two or more soil treatment area sections that are dosed on a frequent rotating basis.
    b. Where soil conditions are similar between the sections, each section area must be the same size. If soil conditions are such that long-term acceptance rates are different, each section may be sized for the same dose, but different long-term acceptance rates.
    c. An automatic distribution valve must be used.
    d. Dosing of each system must be evaluated by the design engineer based on projected daily flow rates, number of zones, and soil types.
6. **Inspection ports:**
    a. A 4-inch inspection port accessible from the ground surface must be installed at the terminal end of each lateral in a trench system and at each corner of a bed system. The bottom of the inspection port must extend to the infiltrative surface and not be connected to the end of a distribution pipe.
    b. Inspection ports in chambers may be installed according to manufacturer's instructions if the infiltrative surface and effluent levels can be observed from the inspection port.
    c. Additional inspection ports connected to distribution pipe may be installed.
    d. In addition, the Fremont County Public Health Agency may require an inspection port at the end of each lateral in a trench.
    e. The top of the inspection ports may be terminated below the final grade if each is housed in a component such as a valve box for a lawn irrigation system and has a removable cover at the ground surface.
    f. Perforations/slots in the inspection ports of a rock and pipe installation shall be provided from near the base of the pipe, and extending to at least eight inches above the infiltrative surface. Multiple slots or orifices must be provided.

G. Storage/Distribution Media:

1. **Rock and Pipe:**
    a. The perforated pipe must be surrounded by clean, graded gravel, rock, or other material of equal efficiency which must range in size from ½ inch to 2 ½ inches. AASHTO M 43 size No. 3 coarse aggregate meets this specification.
    b. At least six inches of gravel, rock or other material must be placed below the pipe. The gravel, rock or other material must fill around the pipe and at least two inches above the top of the distribution pipe.
    c. The top of the placed gravel or such material used must be covered with non-woven permeable geotextile meeting a maximum thickness

rating of 2.0 ounces per square yard or equivalent pervious material. An impervious covering must not be used.

2. Chambers:

a. Chambers must be installed with the base of the unit on in-situ soil or, if placed on acceptable media, the manufactures installation instructions must be followed so as to prevent chambers from setting into media.

b. Effluent pipes from the distribution box or manifold must enter at least six inches above the base chamber on standard height chambers, and at least three inches above the base chamber on the low profile models.

c. Installation must be according to manufacturer's instructions.

d. Effluent may be distributed by gravity, pump or siphon.

e. As per section 13.E.1.d, if the total area covered by chambers is at least 90 percent of the excavated area, it may be approved as being the equivalent square footage of the total excavation.

(1) The area below the chamber endcaps must not be included in the calculations of the soil treatment area.

3. Media, Enhanced, or other Manufactured:

a. Manufactured media must be installed with the base on the in-situ soil or placed on acceptable media meeting the manufacturer's specifications for proprietary distribution products or combined treatment/distribution products.

b. Installation must be according to manufacturer's instructions.

c. Pressure distribution is required for TL2-TL3N effluent, unless otherwise noted in this regulation.

4. Drip Dispersal Systems:

a. The infiltrative surface must be calculated using the long-term acceptance rate for the site or a more conservative value if recommended by the manufacturer. Adjustment factors in Table 10-2 and 10-3 may not be used.

b. Driplines must be installed on manufacturer's spacing recommendations.

c. Drain back must be provided for all driplines, pipes and pumps.

d. Provisions must be made to minimize freezing in the distribution pipes, driplines, relief valves and control systems.

e. Provisions must be made for filtering, back-flushing or other required maintenance .

5. Tire Chips:

a. The pipe may be surrounded with clean, uniformly-sized tire chips.

b. Tire chips must be nominally two inches in size and may range from ½ inch to a maximum of four (4) inches in any one direction.

c. Wire strands must not protrude from the tire chips more than 0.75 inches. (3/4″)

d. Tire chips must be free from balls of wire and fine particles less than two mm across. (5/64″)

e. The top of the tire chips used must be covered with a non-woven permeable geotextile meeting a maximum thickness rating of 2.0 ounces per square yard or equivalent pervious material. An impervious covering must not be used.

H. **Soil Replacement Systems:**

The construction of a soil replacement system is permitted to bring the soil treatment area into compliance with the requirements of this regulation.

1. When soil type "R" is removed, the following requirements must be met:

a. All added soil must comply with the following specifications;

(1) Added soil must meet the specifications of imported treatment sand media, as specified in section 11.C.2.d.

(2) The long-term acceptance rates as specified in section 11.C.3.b must be used. No additional sizing adjustments are allowed.

(3) The depth of the added media must comply with the requirements of Table 10-1A.

(i) In order to utilize the reduced vertical separation requirements for TL2 or higher quality effluent, the Fremont County Public Health Agency must have a program for inspection and over sight as specified in section 14.D.4.

(4) All added soil must be completely settled prior to the instillation of components as specified and approved by the design engineer.

(5) Pressure Distribution Must Be Used.

2. When sand media is added to the soil treatment area or to an excavation where a soil type 1-5 (Table 10-1) is the underlying soil, the following requirements must be met:

a. Added soil must meet the specifications of imported treatment sand media, as specified in section 11.C.2.d.

b. Unless the design follows the criteria for a sand filter or mound system design where ≥ 24 inches of sand is installed as required in section 11, or a higher level treatment level treatment system has been installed and the Fremont County Public Health Agency implements a maintenance over sight program as provided in section 14.D, the TL1 long-term acceptance rate of the most restrictive soil within 12 inches below the sand base must be used.

c. For sites where the proposed soil treatment area had been previously filled, the existing fill material must be removed and replaced with imported treatment sand meeting the specifications od section

11.C.2.d. The excavation must also extend 12 inches below the original grade (grade prior to fill). Only existing fill material meeting the requirements of a soil type 1 will be allowed to remain.

d. All added soil must be completely settled prior to installation of components.

I. Repairs:

1. When space is not available or if there are other site limitations that preclude other soil treatment area options for OWTS repairs, wide beds, deep gravel trenches, deep beds, and seepage pits may be considered for repairs only. Other options are vaults or higher level treatment systems, if the Fremont County Board of Health permits them. For the specific repair or modification of an existing cesspool where site conditions preclude installing a conforming OWTS, one of the preceding repair options, or installing a septic tank, the Fremont County Board of Health may consider a variance per the requirements of section 4.N. For a cesspool variance, the applicant has the burden of proof to demonstrate that;

(1) The variance is justified due to specific site constraints.

(2) Installing a septic tank is not feasible under section 4.N.2.e.

2. Repairs to failing systems must conform to setbacks identified in Table 7-1 when possible. If this is not possible using all available methods described above, the Fremont County Public Health Agency may permit reductions to setbacks. At no point will a setback reduction be approved by the Fremont County Public Health Agency that is less than what the existing separation is to the existing OWTS. In maximizing this setback distance, all methods available in section 10.I.1 must be utilized including but not limited to the use of Higher Level Treatment, wide beds, seepage pits, etc., where allowed. Any setback reduction beyond what the existing failing system presents must be approved by the Fremont County Board of Health as outlined in section N.

3. Soils information obtained for the previous OWTS installation may be used if the information meets the requirements of section5.D.2.j. Otherwise, an additional soils investigation will be required.

4. **Wide Beds:** For repairs, beds may be wider than 12 feet without being required to receive effluent meeting Treatment Level 2 quality or better.

5. **Deep Beds:** For repairs the infiltrative surface of a bed may be no deeper than five feet. Size adjustments as provided for in Tables 10-2 and 10-3 must not be applied. System sizing will be based strictly on the soil type and corresponding LTAR.

6. **Deep Gravel Trenches:**

a. Deep gravel trenches may only be installed in soil type 1, 2, 2A, and 3. Installation in soil types 3A, 4A, 5 and R are prohibited.

b. The length of an absorption trench or bed may be calculated by allowance for the sidewall area of additional depth of gravel in excess of six inches below the bottom of the distribution pipe according to the following formula:

$$\text{Adjusted Length} = L \times \frac{(W+2)}{(W+1+2D)}$$

Where:

L = length of trench prior to adjustment for deep gravel

W = width of trench in feet

D = additional depth in feet of gravel in excess of the minimum required six inches of gravel below the distribution pipe

c. Vertical separation requirements provided in Table 7-2 must be met.

d. Maximum allowable depth from existing grade to the trench bottom is five feet.

e. Evaluation of soil profile test pit excavation or percolation tests must be performed at the proposed infiltrative surface depth.

f. Size adjustment as provided for in Tables 10-2 and 10-3 must not be applied to deep gravel systems.

6. Seepage Pits:

a. For repairs, the potential risk to public health and water quality may be evaluated by the Fremont County Public Health Agency. If risk is low in the determination of the Fremont County Public Health Agency, a seepage pit without higher level treatment may be used.

b. If the risks are not low, higher level treatment of at least TL2 must be attained prior to discharge to these systems for final dispersal.

c. Reductions in the vertical, horizontal separation or system sizing requirements for the use of higher level treatment systems with seepage pits are not allowed.

d. A seepage pit must consist of a buried structure of precast perforated concrete, or cinder or concrete block laid dry with joints open.

(1) Pits must be provided with both vertical sidewall and top supporting structural concrete or other material of equal structural integrity.

(2) The excavation must be larger than the structure by at least 12 inches on each side and may not exceed five feet beyond the structure wall.

(3) The over-excavated volume must be filled with clean graded gravel or rock, which may range from ½ inch to 2 ½ inches.

AASHTO M 43 size No. 3 coarse aggregate meets this specification.

(4) The capacity of the pit must be computed on the basis of long-term acceptance rates determined for each stratum penetrated. The weighted average of the results must be used to obtain a design figure.

(5) Soil strata in which the percolation is slower than 30 minutes per inch must not be used for absorption or seepage. These strata must not be included in the weighted average to determine the long-term acceptance rate.

(6) The infiltrative surface of the pit is the vertical wall area (based on dug perimeter) of the pervious strata below the inlet plus the bottom of the excavated area.

(7) The bottom of the pit excavation must be greater than four feet above the limiting layer, restrictive layer, or groundwater condition.

e. Pits must be separated by a distance equal to three times the greatest lateral dimension of the largest pit. For pits over 20 feet in depth, the minimum space between pits must be 20 feet.

f. The requirements for the design and construction of seepage pits for the treatment and dispersal of on-site wastewater on new sites is defined in section 12.B.

7. Wastewater Ponds:

a. Construction of new wastewater ponds is prohibited.

b. For repairs of an existing wastewater pond, the potential for risk to public health and water quality may be evaluated by the Fremont County Public Health Agency. If risk is low in the determination of the Fremont County Public Health Agency. The repair of a wastewater pond may be permitted; however, the following must be followed:

(1) A septic tank must precede the wastewater pond.

(2) The depth of the design volume of the wastewater pond must be at least five feet.

(3) A wastewater pond must have two feet of free board above the design volume of the pond.

(4) A wastewater pond must be fenced to keep out livestock, pets, vermin, and unauthorized people.

(5) Wastewater ponds must be designed on the basis of monthly water balance including design flow, precipitation, evaporation and seepage.

(6) Wastewater ponds must be constructed so the seepage out of the bottom or sides does not exceed 1/32 of an inch per day. If this limit cannot be achieved using compacted natural soil materials

including soil additives, an impermeable synthetic membrane liner must be used.

(7) If the evapotranspiration does not exceed the rate of inflow of the effluent from the structure, a soil treatment area meeting the requirements of this regulation must be installed to accept excess flow.

(8) Maintenance must include preventing aquatic and wetland plants from growing in or on the edge of the pond, protecting side from erosion, and mowing grasses on the berm and around the pond.

(9) Wastewater ponds must be designed by a professional engineer.

8. Vaults:

a. The allowable use of vaults for repairs in the jurisdiction of Fremont County is determined by the Fremont County Board of Health.

b. Criteria for vaults are in section 12.C. of this regulation.

9. Higher Level Treatment Options:

a. Soil treatment area reductions and vertical and horizontal separation distance reductions for repairs, based on higher level treatment, is not allowed in Fremont County.

10. Remediation Systems:

a. The intent of a remediation technology or process is to sufficiently increase the infiltration rate through the infiltrative surface at the bottom of an existing trench or bed and restore permeability to the soil below. Treatment levels as defined in Table 6-3 are not granted to remediation technologies.

b. The Fremont Public Health Agency may permit the use of remediation technologies or processes to address an existing failure or malfunction within a soil treatment area.

c. The use of a remediation technology or process constitutes an alteration to the OWTS, and therefore the owner must obtain a permit for this work from the Fremont County Public Health Agency.

d. Upon approval from the Fremont County Public Health Agency, a system owner may choose to try a remediation technology or process to see if an existing problem with the soil treatment area will be resolved. The system owner bears the risk and cost of this attempt and is aware that an additional repair may be required.

e. Remediation technologies and processes must not adversely affect ground water, surface water, any existing components, and the long-term effectiveness of the soil treatment area or the environment.

f. If the remediation technology or process does not correct the problem with the system, a conforming OWTS must be installed per the requirements in this regulation within a time frame determined by the Fremont County Public Health Agency.

g. The Fremont Public Health Agency may require monitoring and/or maintenance of the remediation technology or process as a stipulation of permit issuance.

11. Design Criteria – Higher Level Treatment Systems

A. **General:**

1. Higher level treatment systems must be designed by a professional engineer.
2. Higher level treatment systems may be public domain technology systems or proprietary systems.
   a. Public domain technology systems must be designed, installed and maintained according to established criteria and additional criteria established by the Fremont County Public Health Agency. When design criteria are not specifically provided in this regulation, the criteria used in the design must be from a reference commonly used as an industry standard and the criteria must be cited in the design.
   b. Proprietary systems must be designed, installed, and maintained according to manufacturers' instructions and additional criteria identified in the Technology Review and Acceptance process, section 13.
3. Reductions to soil treatment area or separation distances based on higher level treatment systems shall not be permitted.
   a. Exception: application rates for unlined sand filters and mound systems provided within sections 11.C.3.b and c, and sections 11.D.2 and 3, may be applied without the implementation of a Fremont County Public Health Agency oversight program as described in section 14.D. However, maintenance of these systems is always recommended.
4. Soil treatment areas for higher level treatment systems must be pressure dosed.
5. Systems must be capable of accommodating all anticipated flows and organic loads.
6. Ventilation and air systems: Mechanical components must be installed in a properly vented location, and all vents, air intakes, and air hoses must be protected from snow, ice, or water vapor accumulations.
7. Covers, barriers, or other protection: All systems must be installed to include protection of openings against entry of insects, rodents, other vectors and unauthorized people.

B. **Treatment Levels:**

The treatment levels identified in Table 6-3 are specified in this section for public domain technology. Proprietary treatment systems will be assigned a treatment level by the technology review and acceptance process in section 13. Adequate maintenance for each system must be required and documented as in section 14.D.

C. **Sand Filters:**

1. **A lined intermittent sand filter**, or a re-circulating sand filter, may be used as a higher level treatment system prior to dispersing the effluent into a soil treatment area.

2. **Intermittent (Single Pass) Sand Filters, General Requirements**:

a. **Treatment level**:

The treatment level for intermittent sand filters is considered TL3.

b. **Size adjustment factors provided in Tables 10-2 and 10-3 are not applicable for sand filters.**

c. **Pressure Distribution:**

Pressure distribution is required. The design of the distribution system must comply with the requirements in section 10.E.3.

d. **Sand filter Treatment Media:**

(1) The depth of the sand media below the distribution system must be at least 24 inches unless otherwise noted in Table 10-1A for type "R" soils.

(2) "Imported Treatment Sand" media requirements:

(i) Effective size: 0.15-0.60 mm

(ii) Uniformity coefficient: ≤ 7.0

(iii) Percent fines passing #200 must be sieve: ≤ 3.0

(iv) 100% must pass the 3/8" sieve; ≥ 95% must pass the #4 sieve; > 65% must pass the #10 sieve (2 mm).

(3) A gradation of the sand media used must be provided.

(i) The gradation must be dated no more than four months prior to the installation date. However, a gradation of the actual material placed in the excavation is recommended.

(ii) The gradation must be provided to the Fremont County Public Health Agency on a letterhead from Either the source gravel pit, or an independent materials testing laboratory.

e. **Gravel Requirements:**

(1) Clean, graded gravel, or rock, must range in size from ½ inch to 2 ½ inches. AASHTO M 43 size No. 3 coarse aggregate meets this specification.

(2) The gravel must surround the distribution pipes used to disperse the effluent and must be at least 6 inches below and 2 inches above the pipes.

(3) Division accepted manufactured media may be used as an alternative to specified gravel.

f. Filter Fabric Requirements:

(1) The top layer of gravel be covered with a non-woven permeable geotextile fabric meeting a maximum thickness rating of 2.0 ounces per square yard or equivalent pervious material.

g. Final Cover material:

(1) 8 inches – 10 inches of Type 1 or 2 soil with 2 inches of top soil.

h. Sand filters must not be used to treat wastewater that does not conform to TL1 treatment level or better.

3. Unlined (Open Bottom) Sand Filters:

a. All requirements of the XI.C.2.a-i will apply to unlined sand filters.

b. Application rates for the distribution media where a minimum of 24 inches of imported treatment sand is instated:

(1) Maximum hydraulic loading rate for TL1 effluent applied to "imported treatment sand" in an un-lined sand filter is 0.8 gal/sq. ft./day.

(2) Maximum hydraulic loading rate for TL2, TL2N, TL3, TL3N, or TL3ND effluent applied to "Imported treatment sand" is the soil type 1 LTAR for the treatment level of the effluent received, TL2 or TL3 (Table 10-1).

c. Application rates for the in-situ soil where a minimum of 24 inches of imported treatment sand is installed.

(1) Maximum hydraulic loading rate for the in-situ soil when TL1 – TL3ND effluent is applied to the "Imported treatment sand" is TL3 LTAR, (Table 10-1) of the most restrictive soil within 12 inches below the sand base.

d. The upper infiltrative surface of an un-lined sand filter receiving TL1 effluent must be at least three feet above the limiting layer or groundwater condition.

e. The upper infiltrative surface of an un-lined sand filter receiving TL2 or-TL2N effluent must be at least two and one half feet above a limiting layer or groundwater condition.

f. The upper infiltrative surface of an un-liner sand filter receiving TL3, or TL3N effluent must be at least two feet above a limiting layer or groundwater condition.

g. The upper infiltrative surface of an unlined sand filter receiving TL3ND effluent must be at least one foot above a limiting layer, or groundwater condition.

h. Where adjacent sand filters are installed, the base of the excavation for each sand filter must be no closer than six feet, sidewall to sidewall.

4. Lined, Single-Pass Sand Filters:

a. All requirements for application rates provided within section 11.C.2.b. will apply to lined sand filters.

b. The minimum depth of the sand media in a lined sand filter must be two feet.

c. An intermediate layer of pea gravel, two inches in thickness, must be placed between the sand filter media and the course under-drain media to prevent the migration of sand into the lower layer of the under-drain gravel. ASTM C 33 - 23, (2023 version) No. 8, coarse aggregate meets this specification.

d. A minimum four-inch diameter slotted SCH40 PVC [ASTM Standard D2729-21 (2021 Version)] under-drain pipe must be used to collect the treated effluent. The under-drain pipe must be installed in the center of a 5 inches thick bed of washed, graded gravel, or rock ranging in size from ½ inch to 2 ½ inches. AASHTO M 43 – 05 (2005 version), No. 3 coarse aggregate meets this specification.

e. Lined sand filters must have an impervious liner on the sides and bottom of the filter. The liner must consist of a minimum 30 mil thick PVC material or equivalent.

f. Effluent collected by the under-drain must be dispersed to a soil treatment area. The soil treatment area may be sized with the maximum long-term acceptance rate of the receiving soil for TL3 effluent.

g. The base of the liner must be at least two feet above an actual or seasonal high ground water elevation.

5. Lined, Recirculating Sand Filter:

a. Treatment level:

(1) Treatment level provided within recirculating sand filters is TL3.

b. General Design Parameters:

Not all combinations of the variables noted below will result in a proper distribution system design. Engineer must justify through calculations or design software that the selected values will concur with industry standards.

(1) Distribution pipe size: ¾ inch – 2 inches (PVC Class 200, min.)

(2) Distribution pipe spacing: 18 inches – 36 inches (24 inches typ.)

(3) Orifice size: 1/8 inch – ¼ inch.

(4) Orifice spacing: 18 inches – 36 inches (24 inches typ.)

(5) Pressure head at the end of the distribution pipe: 24 inches – 72 inches (60 inches typ.)

c. Dosing:

(1) Timed dosed, pressure distribution is required. The design of the distribution system must comply with the requirements of section X.E.3.a.

(2) Recirculation ratio: 3:1 – 5:1
(3) Gallons/orifice/dose: 1 – 3 (2.0 typ.)
(4) Hydraulic loading: 3 – 5 gal. /sq. ft. /day (4-5 typ.)
(5) Dosing time "ON" : <2.5 min. (<2.0typ.)
(6) Number of cycles/day: 48 – 120

d. Top gravel requirements:

(1) Washed, graded gravel, or rock, must range in size from ½ inch to 2 ½ inches. AASHTO M 43, No. 3 coarse aggregate meets this specification.
(2) The gravel must surround the distribution pipes used to disperse the effluent and must be at least 6 inches below and 2 inches above the pipes.
(3) State accepted manufactured media may be used as an alternative to specified gravel.
(4) Soil cover is prohibited. The upper gravel layer must be open to the atmosphere.

e. Filter media requirements:

(1) Effective size: 1.5 – 2.5 mm
(2) Uniformity coefficient: ≤ 3
(3) Fines passing #200 sieve: ≤ 1.0
(4) Media depth (min.): ≥ 24 inches

f. Intermediate gravel layer:

(1) An intermediate layer of pea gravel, two inches in thickness, must be placed between the coarse under-drain media and the sand filter media to prevent the migration of sand into the lower layer of under-drain gravel (ASTM C 33, No. 8, coarse aggregate).

g. Under-drain requirements:

(1) A minimum four-inch diameter slotted SCH40 PVC under-drain pipe must be used to collect the treatment effluent. The under-drain pipe must be installed in the center of a 5 inch thick bed of washed, graded gravel, or rock ranging in size from ½ inch to 2 ½ inches. AASHTO M 43, No. 3 coarse aggregate meets this specification.

h. PVC liner requirements:

(1) Lined sand filters must have an impervious liner in the sides and bottom of the filter. The liner must consist of a 30 mil thickness PVC material or equivalent.
(2) The base of the liner must be at least two feet above an actual or seasonal high ground water elevation.

i. **Recirculating Sand Filter / Effluent Discharge:**

(1) Effluent collected from the recirculating sand filter must be discharged to a soil treatment area. The soil treatment area may be sized with a maximum long - term acceptance rate of the receiving soil for TL3 effluent.

D. Mound System:

1. When the infiltrative surface area of the imported sand media receiving wastewater effluent is at or above the natural ground surface at any point, it shall be considered a mound system. Mound designs can include a variety of parameters:
   a. A mound installation where all of the imported sand is installed above existing grade.
   b. A mound installation where the top of the imported sand is installed entirely above existing grade, but the base of the imported sand is installed below existing grade.
   c. A mound installation where the top of the imported sand is installed both above and below the existing grade.
2. Sand Fill Loading Rate (Top of imported treatment sand)
   a. For mound systems that receive TL1 effluent, and provides A MINIMUM OF 24 INCHES of imported treatment media, the LTAR for the imported treatment sand is 0.8 gal./sq/ft/day.
   b. For mound systems that receive TL2, - TL3ND effluent, and provides A MINIMUM OF 24 INCHES of imported treatment sand media, the upper infiltrative surface of the imported treatment sand is to be sized on the soil type 1 LTAR for the treatment level of the effluent received, as provided in Table 10-1; TL2 or TL3.
   c. Where TL1 effluent dispersed to the distribution media in mound systems where LESS THAN 24 INCHES of sand is installed, the LTAR of the imported treatment sand is the TL1 LTAR of the most restrictive soil layer within 36 inches of the upper infiltrative surface (top of imported sand).
   d. Where TL2 – TL3ND effluent dispersed to the distribution media in mound systems where LESS THAN 24 INCHES of sand is installed, the system is to be sized on the LTAR of the most restrictive soil layer within 36 inches of the upper infiltrative surface (top of imported sand), relative to the treatment level of the effluent received; TL2 or TL3.
   NOTE: Fremont County Public Health Agency has not adopted a program for oversight of the inspection and maintenance as provided in section 14.D. therefore, the TL1 application rate as noted in section 2.c above apply.
3. Soil Loading Rates (Base of imported treatment sand)
   a. Mound systems that provide a minimum of 24 inches of imported treatment sand media may use the TL3 application rates (Table 10-1) of the most restrictive in-situ soil layer within 12 inches of the imported sand base. Size adjustment factors within Table 10-3 must not be applied to mound designs where TL3 application rates are used. However, the adjustment factors may be applied if TL1 application rates are used.

b. A mound system may **include less than 24 inches** of imported treatment sand media on a site where lesser depth of sand media is sufficient to meet vertical separation requirements above a "limiting layer" or "groundwater condition", as specified in Table 7-2. When less than 24 inches of treatment sand is imported, the following criteria shall apply:

(1) Where TL1 effluent is applied, TL1 application rates for the most restrictive in-situ soil layer within 36 inches of the top of the imported sand must be used. Size adjustment factors within Table 10-3 may be used.

(2) Where the Fremont County Public Health Agency provides an oversight program as referenced in 14.D, and the effluent is treated to TL2 – TL3ND quality prior to dispersal into the distribution media, the LTAR is the soil loading, rate of the most restrictive in-situ soil layer within 12 inches of the imported sand base for the treatment level of the effluent received, as provided in Table 10-1; TL2 or TL3. Vertical separation requirements of Table 7-2 must be met, relative to the treatment level of the effluent received. Size adjustment factors within Table 10-3 may not be used.

NOTE: Fremont County does not have an oversight program at this time therefore this section does not apply.

(3) Where the Fremont County Public Health Agency DOES NOT PROVIDE an oversight program as referenced in 14.D, and the effluent is treated to TL2 – TL3ND quality prior to dispersal into the distribution media, TL1 application rates as noted in section 11.D.2.c must be used. Size adjustment factors within Table 10 – 3 may be used.

4. Linear loading rates:

a. The design engineer must evaluate many factors to achieve an accurate determination of the linear loading rate. While application rates for the in-situ receiving soil under the mound is a main component, placement on the slope, and percent of slope must also be addressed when defining the linear loading rate. If the movement of the effluent is primarily vertical, then the linear loading rate is not critical. However, if the movement of the effluent will be primarily horizontal, as would be expected in soil types 3 through 5 (Table 10-1), then the linear loading rate is extremely important, and long narrow mounds are necessary.

b. When TL1 effluent is applied to the distribution media of a mound system installed above in-situ soil types with permeabilities less than 60 min./inch (Table 10-1, and Table 10-1A), the suggested linear rate is

between 6gpd/lin.ft., and 12gpd/lin.ft. The maximum width of the distribution media in a mound system installed above these soil types is 12 feet when TL1 effluent is applied to the distribution media of a mound system.

c. When TL2 - 3ND effluent is applied to the distribution media of a mound system installed above the in-situ soil types with permeabilities exceeding 60 min./inch (Table 10-1, and Table 10-1A), the linear loading rate may exceed 12gpd/lin.ft.; subsequently the mound may be wider than 12 feet.

d. When TL1 - TL3ND effluent is applied to mound systems installed above in-situ soil types with permeabilities exceeding 60 min./inch (Table 10-1, and Table 10-1A), the suggested linear loading rate is between 3gpd/lin.ft. and 5 gpd/lin.ft. The maximum width of the distribution media in a mound system placed above these soil types is 12 feet however once calculated, a lesser width may be required.

5. Mound systems must conform to the design requirements of section 11.C.2 and 3, unless otherwise specified within this section. (11.D)
6. The basal area must be determined using the requirements for the soil loading rate and linear loading rate provided above.
7. The final cover over a mound system must extend at least 12 inches horizontally beyond the perimeter of the distribution media prior to sloping down to existing grade. The final slope of the mound must be no greater than three feet horizontal to one-foot vertical.
8. The surface of the mounded area must be planted with suitable vegetative cover; preventing erosion and promoting run-off.
9. Suggested references for the design and installation of mound systems are, "The CDPHE Mounded Wastewater Treatment Systems Technical Guidance" and "The Wisconsin Mound Soil Absorption System Siting, Design, and Construction Manual, January 2000". Note that these are suggested guidance, and where the requirement of this regulation differs from those in the referenced mound documents, the requirements of this regulation will govern in those cases.

E. Rock Plant Filter (Constructed Wetland) Treatment before a Soil Treatment Area:

1. A rock plant filter system must be designed by a professional engineer.
2. The design must be site specific and include specifications for: loading, capacity, dimensions, liner material, filter media, effluent depth and depth control mechanism, density and species of plant material, and other site specific information.
3. The treated effluent from a rock plant filter must be distributed to a soil treatment area.

4. Although producing higher level treatment, rock plant filters must not be assigned a treatment level higher than TL1 because of system and seasonal variability.

12. Design Criteria – Other Systems

A. **Evapotranspiration and Evapotranspiration/Absorption Systems:**

1. Non-Pressurized Drip Dispersal System (NDDS):
   a. An NDDS is considered a type of evapotranspiration/absorption system. However, as specified design criteria are provided for an NDDS (see section 12.A.1.c and d), they are exempt from the additional requirements of pressure distribution, and items within section 12.A.2, 3 and 4.
   b. New NDDA installations are prohibited because the Fremont County Public Health Agency has not adopted a maintenance oversight program as described in section 14.D.4.
   b. The Colorado Professionals in Onsite Wastewater Guidelines for the Design and Installation of Non-Pressurized Drip Dispersal Systems (NDDS), October 2024 is the procedural guideline in the design of a NDDS and must be followed when an NDDS is proposed. (the document is available at www.cpow.net).
   d. The width of an NDDS system may be wider than 12 feet.

2. The following section provides general criteria which must be followed when an evapotranspiration or evapotranspiration/absorption bed is proposed.
   a. This design may only be permitted in arid climates where an annual evaporation rate exceeds the annual precipitation rate by more than 20 percent, and where the site characteristics dictate that conventional methods of effluent dispersal are not appropriate.
   b. The design may only be permitted in soil types 4, 4A and 5.
   c. The system must be designed by a professional engineer.
   d. If data for the Pan Evaporation Rate is provided, it must be multiplied by 0.70, or less, to obtain the equivalent Lake Evaporation Rate.
   e. The width of the bed may be wider than 12 feet.
   f. The required capillary or wicking sand must meet the gradation requirements in Table 12-1 and be approved by the design engineer.
      (1) The gradation of the wicking sand must be submitted to the local public health agency on letterhead from either the source gravel pit, or independent materials testing laboratory. The gradation must be dated not more than one month prior to the installation date.
   g. This sand is to be covered by a crowned, thin layer of loamy-sand mix and appropriate vegetation that will assist in drawing the water to the surface.

h. Adjustment factors as provided in Table 10-2 and 10-3 must not be used.

Table 12-1 Gradation of Wicking Sand for Evapotranspiration Beds

Sieve Size	Percent Passing
4	100
40	50-70
200	<15

3. For systems designed strictly as an evapotranspiration bed, the following must be met:
   a. Design data to be furnished must include, but shall not be limited to: system dimensions, distribution system design, specifications of distribution media and wicking sand, liner material if used, bedding properties of the soil under the system, vegetation cover, and a water balance calculation including annual precipitation and storage requirements for periods of the year when evapotranspiration does not occur.
   b. The following formula must be used for determining the minimum area necessary for total evapotranspiration of septic tank effluent:

$$\text{Area (in square feet)} = \frac{\text{Design Flow (in gallons per day)} \times 586}{\text{Lake Evaporation Rate at the Site (in inches per year)}}$$

   * Additional area may be required based on annual water balance calculations.

   c. Designs will include a rock and pipe, or other Division approved proprietary distribution product, with the centerline of the distribution system laterals no more than 6 feet on center and within 3 feet of the sidewall or endwall. A thin non-woven fabric may be placed above the distribution system. Capillary wicking of the effluent is accomplished by a uniform depth layer of the specified sand media (capillary wicks), no more than 24 inches deep, placed between and above the distribution media. The base of the evapotranspiration bed may be no more than 30 inches below finish grade.
   d. Capillary wicks which penetrate between the distribution system to the bottom of the bed, must be at least 15 percent of the bed surface area. The wicks must be uniformly spaced throughout the system.
   e. Except for dwellings, if the system is designed for summer use only, as determined by the Fremont County Public Health Agency, the surface area may be multiplied by 0.6 to obtain the required area.

4. For systems designed as an evapotranspiration/absorption bed, the following must be met:
   a. Data to be furnished must include, but is not limited to: system dimensions, distribution system design, specifications of wicking sand, properties of the soil under the evapotranspiration/absorption bed, provision of vegetation cover, and a water balance calculation including annual precipitation and storage requirements for periods of the year when evapotranspiration does not occur.
   b. Designs will include a rock and pipe, or other Division approved proprietary distribution product, with the centerline of the distribution system laterals no more than 6 feet on center. A thin non-woven fabric as defined within section 10.G.1.c may be placed above the distribution system. Capillary wicking of the effluent is accomplished by a uniform depth layer of the specified sand media (capillary wicks), no more than 24 inches deep, placed between and above the distribution media. The base of the evapotranspiration bed may be no more than 30 inches below finish grade.
   c. Capillary wicks which penetrate between the distribution system to the bottom of the bed, must be at least 15 percent of the bed surface area. The wicks must be uniformly spaced throughout the bed.
   d. Amount of storage and evapotranspiration capacities may be reduced by the volume of effluent absorbed by the underlying soil based on the long-term acceptance rate for that soil type and the formulas provided in section 13.A.4.e below.
   e. The following formula must be used for determining the minimum area necessary for the evapotranspiration/absorption of the septic tank effluent:

(1) $$\text{Area (sq. ft.)}^{*} = \frac{\text{Flow (gpd)}}{(\text{LTAR} + \text{ETR})}$$

(i) LTAR refers to long-term acceptance rate of the underlying soil as provided in Table 10-1 for TL1 effluent.

(ii) ETR refers to the evapotranspiration rate delivered from the following formula:

$$\text{ERT (gal./day sq. ft.)} = \frac{\text{Lake Evaporation Rate at the Site (in inches per year)}}{586}$$

*Additional area may be required based on the annual water balance calculations

B. Seepage pits:

1. The construction of new seepage pits for the treatment and disposal of on-site wastewater on new sites is prohibited unless:
   a. A trench or a bed system will not meet the design, sizing or setback requirements of this regulation on the proposed site;
   b. The seepage pit is designed by a professional engineer; and

c. The design includes higher level treatment of at least TL2N.

2. The design requirements for new seepage pits must also comply with the requirements as defined in section 10.I.6.c and d.

3. Pressure distribution is not required for dispersal into a seepage pit.

C. Vaults Other Than Vault Privies:

1. The Fremont County Board of Health may allow or prohibit vaults for the use in permanently occupied facility, except where section 12.C.2 applies.

2. Vaults are prohibited where any of the following conditions exist:
   a. Sites that cannot provide access for pumping and general system maintenance.
   b. Full time or limited use in new construction where the property can accommodate an OWTS with a soil treatment area.

3. Vaults may be permitted where any of the following conditions exist:
   a. For full time use when an existing OWTS is in a state of failure and cannot be replaced.
   b. For full time or limited use on a property which cannot accommodate an OWTS with a soil treatment area.
   c. If the structure is on land where the installation of an OWTS with soil treatment area is not permitted.
   d. For systems where a portion of the wastewater flows are separated, such as toilet waste only, or a private recreational vehicle dump station, into a vault. The portion not retained in the vault must be treated in an OWTS sized per the requirements of this regulation.
   e. Variances may be granted for specialized commercial uses.

4. Design and Capacity Requirements:
   a. A vault must be accessible for routine pumping and maintenance.
   b. A vault must have a minimum of 1000-gallons of effective volume or be capable of holding a minimum of the 48 hour design wastewater flow, whichever is larger.
   c. A visual or an audible signal devise or both, indicating filling to a maximum of 75 percent capacity to indicate when pumping is necessary.
   d. Concrete, fiberglass, and plastic tanks are allowed for the use of a vault. All tanks must meet the structural design requirements of section 9.B.5 or 6, as applicable.
   e. Vaults must be water tight, and meet the requirements of section 8.D and 9.A.1.a.
   f. Metal vaults are prohibited.

D. Privies:

1. Vault Privy
   a. A Vault Privy can be installed in Fremont County only after a design review and approval from the Fremont County Board of Health.

b. The Fremont County Board of Health may prohibit the continued use of existing vault privies.

c. Effective volume of the vault must be no less than 400 gallons, and it must be constructed of concrete, fiberglass, or plastic. The vaults for privies must meet the structural and watertight requirements of section 9.B.5 or 6, as applicable.

d. A vault privy must be built to include: fly- and rodent-tight construction, a superstructure affording complete privacy, an earth mound around the top of the vault and below floor level that slopes downward away from the superstructure base, a floor, and a riser of concrete or other impervious material with hinged seats and covers of easily cleanable, impervious material. All venting must be fly-proofed with No. 16 or tighter mesh screening.

2. **Pit Privy:**

a. The Fremont County Board of Health has elected to prohibit any new installation of Pit Privies.

b. The Fremont County Board of Health has elected to prohibit the continued use of existing pit privies.

E. Incinerating, Composting and Chemical Toilets:

1. The Fremont County Board of Health may permit incinerating, composting and chemical toilets. The use of an incinerating, composting or chemical toilet will not reduce the required size of the OWTS as noted in section 8.A.

2. Permitting an incinerating or composting toilet may also be subject to the jurisdiction of a local agency regulating plumbing or the Colorado Plumbing Board, whichever has jurisdiction over plumbing in the location.

3. An incinerating or composting toilet may be used for toilet waste where an OWTS is installed for treating wastewater remaining after removal of toilet waste. Subject to Fremont County Board of Health approval or other applicable regulations or codes (e.g., Colorado Plumbing Code if a local code does not exist), the compartment may be located within a dwelling or building provided the unit complies with the applicable requirements of this regulation, and provided the installation will not result in conditions considered to be a health hazard as determined by the Fremont County Public Health Agency. Compartment and appurtenances related to the unit must include fly-tight and vector-proof construction and exterior ventilation.

4. Incinerating Toilets:

a. An approved incinerating toilet must be designed and installed in accordance with all applicable federal, state and local air-pollution requirements and Manufacturer' instructions.

5. Composting Toilets:

a. Composting toilets must meet the requirements of NSF/ANSI Standard 41 (2023 version) and bear the seal of approval of the NSF or an

equivalent testing and certification program.

b. An approved composting toilet must treat deposits of feces, urine, and readily decomposable household garbage that are not diluted with water or other fluids and are retained in a compartment in which aerobic composting will occur.

c. The effective volume of the receptacle must be sufficient to accommodate the number of persons served in the design of the unit installed. The effective volume of the unit must include sufficient area for the use of composting materials which must not be toxic to the process or hazardous to persons and which must be used in sufficient quantity to assure proper decomposition.

d. Residue from the composting toilet must be removed when it is filled to 75 percent of capacity. Residue from the unit must be properly disposed of by methods recommended by the manufacturer and acceptable to the Fremont County Public Health Agency. Disposal methods must prevent contamination of water and not cause a public health nuisance. Disposal using solid waste practices is recommended.

e. If a system will be installed where low temperature may be a factor, design and installation must address the effects of the low temperature.

f. Composting toilets must be operated according to manufacturer's specifications.

6. Incinerating Toilets Acceptance Requirements

a. Incinerating toilets must meet the requirements of the NSF Protocol P157 (2022 version) and bear the seal of approval of the NSF or an equivalent testing and certification program.

b. An approved incinerating toilet must be designed, installed, and maintained in accordance with all applicable federal, state, and local building, plumbing, and air-pollution requirements, and manufacturer's instructions.

7. Portable Chemical Toilets

a. A portable chemical toilet may be used by permit from the Fremont County Board of Health.

b. Use of a portable chemical toilet in permanently occupied buildings is prohibited except during construction or under emergency circumstances as determined by the Fremont County Board of Health. Proper ventilation of a chemical toilet used inside must be required.

F. Disinfection Systems:

1. The Fremont County Public Health Agency does not have an inspection and maintenance oversight program therefore the use of a disinfection system is not allowed.

G. Slit Trench Latrine:

1. The Fremont County Board of Health has elected to prohibit the construction of or use of any Silt Trench Latrine.

H. Treatment Systems Other Than Those Discharging Through a Soil Treatment Area or Sand Filter System:

1. For systems discharging to State Waters, see section 2.C.
2. Systems that discharge other than through a soil treatment area or a sand filter system must:
   a. Be designed by a professional engineer;
   b. Be reviewed by the Fremont County Board of Health; and
   c. Not pose a potential health hazard or private or public nuisance or undue risk of contamination.
   d. Not allow drainage of effluent off of the property of origin.
3. The Fremont County Board of Health may elect to permit only systems that do not allow drainage of effluent off the property of origin.
4. The following minimum performance criteria must be required for all permitted systems pursuant to this section:
   a. If effluent discharge is made into areas in which the possibility exists for occasional direct human contact with the effluent discharge, the effluent at the point of discharge must meet the minimum treatment criteria of TL3 effluent and specifically adhere to each of the following standards:
      (1) The geometric mean of the E. coli density must not exceed 15 per 100 milliliters when averaged over any five consecutive samples, and no single sample result for E. coli can exceed 126 per 100 milliliters.
      (2) The arithmetic mean of the standard five-day carbonaceous biochemical oxygen demand ($CBOD_5$) must not exceed ten milligrams per liter when averaged over any three consecutive samples.
      (3) The arithmetic mean of the total suspended solids must not exceed ten milligrams per liter when averaged over any three consecutive samples.
   b. If the effluent discharge is made into an area so restricted as to protect against the likelihood of direct human contact with the discharged effluent, the effluent at the point of discharge must meet the treatment criteria of TL2 effluent and specifically adhere to each of the following standards:
      (1) The geometric mean of the E. coli density must not exceed 126 per 100 milliliters when averaged over any five consecutive samples, and no single sample can exceed 325 E. coli per 100 milliliters.

(2) The arithmetic mean of the standard five-day carbonaceous biochemical oxygen demand ($CBOD_5$) must not exceed 25 milligrams per liter when averaged over any three consecutive samples.

(3) The arithmetic mean of the total suspended solids must not exceed 30 milligrams per liter when averaged over any three consecutive samples.

5. To determine compliance with the standards contained in this section, the required sampling frequency for E. coli, $CBOD_5$, and total suspended solid levels must be performed at least once per month when the system is in operation and the results submitted to the Fremont County Public Health Agency for compliance with the permit requirements.

6. Methods of Analysis - Sampling Points:

   a. All effluent samples must be analyzed according to the methods prescribed in the American Public Health Association, American Water Works Association, and Water Environment Federation: Standards Methods for the Examination of Water and Wastewater, 24th edition, 2022 (International Standard Book Number: ISBN – 10:0875532993, ISBN – 13: 0875532998).

   b. The sampling point must be a location that is representative of final discharge from the system.

13. Technology Review and Acceptance

A. General:

OWTS technologies must either be public domain, including but not limited to rock and pipe distribution systems, sand filters with pressure distribution and mound systems, with criteria for design, installation, maintenance and use as described in this regulation, or proprietary products that have received Division review and acceptance before the Fremont County Public Health Agency may permit them for use.

B. The Division must review and provide either comment or acceptance to the manufacturer for proprietary products in these technology categories:

1. Proprietary treatment products (e.g. treatment systems);
2. Proprietary distribution products (e.g. manufactured distribution products or subsurface drip line);
3. Septic tanks;
4. Others as needed.

C. Product Acceptance Requirements – General:

1. To qualify for product acceptance, manufacturers desiring to sell or distribute proprietary products in Colorado must submit a completed application to the Division in the format provided by the Division and a report describing in detail the test procedures and data confirming the performance and properties of the product claimed by the manufacturer. Products within a single series

or model line sharing distinct similarities in design, materials, capacities, configuration, and claiming the same level of treatment may be accepted under a single application. Products outside of the series or model line must be accepted under separate applications. The following information must be included in the application:

a. Manufacturer's name, mailing address, street address, and phone number;
b. Contact individual's name, mailing address, street address, phone number and email address. The contact individual must be vested with the authority to represent the manufacturer in the acceptance process;
c. Category of product (e.g., proprietary treatment product and Treatment level requested, proprietary distribution product, septic tank);
d. Name, including specific brand and model, of the proprietary product;
e. A description of the functions of the proprietary product, along with any known limitations on the use of the product;
f. Product description and technical information, including dimensioned drawings; materials and characteristics; component design specifications; and volumes, design capacity, and flow assumptions and calculations, as relevant;
g. Siting and installation requirements;
h. Product performance information in appropriate product section;
i. Detailed description, procedure and schedule of routine service and maintenance events;
j. Copies of manufacturer's literature to include sales and promotion, design, installation, operation and maintenance, and owner instructions; and
k. Identification of information subject to protection from disclosure and trade secrets, if any.

2. Upon receipt of an application, the Division must verify that the application is complete and meets the requirements for which the product is being evaluated. If the application is found to be complete, and the requirements of this section needed to accept the product are met, the Division will place the product on a list of accepted proprietary products for the type of product. Installation and use of accepted products must comply with the requirements noted on the acceptance document provided by the Division.
3. Manufacturers must have readily accessible and up to date information for designers, regulators, product owners, and other interested parties about their product including:
   a. Product manuals;
   b. Design instructions;
   c. Installation instructions;

d. Operation and maintenance instructions; and

e. A list of representatives and manufacturer-certified service providers in Colorado, if any. If none exist, information on how service on the product will be provided in Colorado.

4. If, at any time after a proprietary product has been accepted for use, the Division receives information that the product so accepted does not meet the required standards, or in any way constitutes a public health or environmental hazard, the Division may, at its discretion, revoke the product acceptance. The Division shall notify the manufacturer and the Fremont County Public Health Agencies within 30 days of any revocation.

D. **Proprietary Treatment Product Acceptance Requirements:**

1. If a proprietary treatment product is submitted to meet a specific treatment level, a report with test procedures and data must be submitted to the Division to demonstrate that it can meet the treatment level for which the approval is being requested on a consistent basis in actual installations. The Division must approve the test methods and programs. Test results from product certification testing must also be submitted.

2. If a product is accepted for a specific treatment level, the product may also be used for applications requiring lower treatment levels. Reductions based on higher level treatment may not be applied unless the Fremont County Public Health Agency has a maintenance oversight program in place as described in section 14.D.

3. Field Performance Testing

a. Testing must be performed by a neutral third party.

b. Testing for residential applications must be performed on a minimum of 12 single-family homes under normal operating conditions unless otherwise noted below:

(1) If the proprietary treatment product is requesting TL2 acceptance and that product has received NSF/ANSI 40 (2023 or earlier version) certification, the number of home sites to be tested may be reduced to six. The NSF/ANSI 40 certification must be submitted if the reduced number of test sites is requested.

(2) If the proprietary treatment product is requesting TL2N acceptance and that product has received NSF/ANSI 245 (2023 or earlier version) certification, the number of home sites to be tested may be reduced to six. The NSF/ANSI 245 (2023 or earlier version) certification must be submitted if the reduced number of test sites is requested.

c. Each system must be tested over a period of at least one year.

d. Each system must be sampled at least four times during the year with the sampling evenly distributed throughout the year.

e. Laboratory results for all parameters for which acceptance is being requested must be submitted.

f. Testing may be performed in Colorado under a Product Development Permit.

g. Testing may be performed in locations other than Colorado. However as part of the testing the manufacture must define, to the acceptance of the Division, what adjustments or modifications to the product will be required to compensate for the following conditions:

(1) Increased elevation results in lower atmospheric pressure and lower oxygen content. Adjustments or modifications to the treatment process may be required to compensate for these conditions and those adjustments or modifications must be specified.

(2) Winter season conditions in Colorado include cold temperatures that may affect product performance. Adjustments or modifications to the treatment process may be required to compensate for these conditions, and those adjustments or modifications must be specified. This item must be addressed if nitrogen reductions are claimed.

h. The report conclusions must indicate the proprietary treatment unit can consistently be expected to meet the treatment level for which acceptance is being requested.

i. The report must include estimated operating costs for the first five years of the treatment system's life. This must include both estimated annual electricity or other energy costs, and routine inspection and maintenance costs, including replacement of parts.

(1) Energy and other costs are to be based on typical Denver, Colorado, costs at the time of the acceptance request.

(2) Replacement part costs must include shipping and handling.

(3) If media or other major part replacement is expected during the normal life of the system, the cost of replacement and the typical replacement interval must be included even if replacement is not expected within five years.

4. The manufacturer must identify the provisions that they have developed for the training of installers and service providers specific t their product line.

5. Following the adoption of Regulation 43 in 2013, the regulation provided limited provisions for the continued acceptance of treatment level 2 proprietary products that had been previously accepted for the use in Colorado prior to June 30, 2013, under NSF / ANSI 40 (2013 or earlier version) or by an equivalent testing agency. Only treatment products with a CDPHE acceptance letter dated after June 30, 2013, will be accepted for use in Colorado.

E. Proprietary Distribution Product Acceptance Requirements:

1. Proprietary manufactured distribution products must:

a. Be constructed or manufactured from materials that are non-decaying and non-deteriorating and do not leach chemicals when exposed to septic tank effluent and the subsurface soil environment;

b. For gravity distribution systems, the product must provide a liquid storage volume at least equal to the storage volume within the assumed 30 percent void space in a rock and pipe distribution system assuming six inches of rock below the pipe and two inches above the pipe;

c. Maintain the integrity of the trench or bed. The material used, by its nature and its manufacturer-prescribed installation procedures, must withstand the physical forces of the soil sidewalls, soil backfill, and the weight of equipment used in the backfilling; and

d. If the width of a proprietary manufactured distribution product is within 90 percent of the width of the excavation, it may be approved as being equivalent to the full width of the excavation, if information is provided that demonstrates distribution over the full width. Thus, the product must cover at least 90 percent of the excavated area in either a trench or bad configuration in order to receive sizing adjustments provided in Table 10-3.

2. Chambers:

a. Include a sidewall that is structurally sound and capable of allowing aeration of the infiltrative surface and exfiltration of effluent while minimizing the intrusion of soil.

b. Chamber construction shall conform to the International Association of Plumbing and Mechanical Officials (IAMPO) Property Standards, PS 63 (2019 Version).

3. Enhanced manufactured media:

a. The product must include synthetic media contained within one or more external permeable outer layers that promote the movement of effluent and prevent the intrusion of soil from above the synthetic media. Manufacturer must demonstrate that the product has been adequately tested, and functions as intended.

b. For enhanced manufactured media that requires a specified layer of sand or other media to be placed below the actual product, the vertical separation requirements of this regulation will be determined from the base of the sand or other media, as the sand or media is an integral part of the component.

c. For products that allow for sand extensions beyond the actual manufactured component, the distance of sand allowed from the edge of the excavation to the manufactured component may be up to six inches in a trench system and 24 inches in a bed system.

d. If sand media is proposed by the manufacturer as an integral part of the distribution product, specifications as noted by the manufacturer.

4. Other manufactured media:

a. In order to receive sizing adjustments provided in Table 10-3, the product must cover at least 90 percent of the excavated area in either a trench or a bed configuration without the use of gravel, stone or other aggregates contain fines, which may compromise soil permeability.

5. Proprietary subsurface drip line products must:

a. Be warranted by the manufacturer for use with OWTS effluent;
b. Specify required treatment level of influent to the drip lines;
c. Be designed for resistance to root intrusion; and
d. Incorporate emitters that may be controlled either by use of pressure-compensation emitters or with a pressure regulator.

F. Septic Tank Acceptance Requirements:

1. Septic tank design must conform to the requirements of section 9.B. of this regulation.
2. Each manufacturer must annually test five percent of its tanks for water tightness at the manufacturing facility, unless the tanks are certified for use as a septic tank by the International Association of Plumbing and Mechanical Officials (IAPMO) or Canadian Standards Association (CSA), or the manufacturer participates in the Plant Certification Program of the National Precast Concrete Association (NPCA).
3. Water tightness results must be sent to the Division on an annual basis unless otherwise addressed in section 8.F.2 above. The manufacturer must provide information that specifies measures taken to repair a tank that fails the water tightness test. The manufacturer must also define the measures taken to prevent similar problems in future tanks.
4. IAPMO, CSA, and NPCA certifications must be submitted to the Division for acceptance. Current certifications must be submitted to the Division on an annual basis.

G. Other Product Acceptance Requirements:

1. The Division may adopt review and acceptance requirements for additional products as needed.

14. Operation and Maintenance

A. **Responsibility:**

The owner must be responsible for maintenance of an OWTS unless the responsibility has been contractually assigned to a tenant or a third party or a public, quasi-public, or political subdivision.

B. **Service Label:**

For higher level treatment systems or other components under a service contract, a clearly visible, permanently attached label or plate giving instructions for obtaining service must be placed at a conspicuous location.

C. **The Fremont County Board of Health may adopt regulations for:**

1. Scheduling of maintenance and cleaning;
2. Practices adequate to ensure performance of an OWTS; and / or
3. Submission of proof of maintenance and cleaning to the Fremont County Public Health Agency by the owner of the system.

D. **Permitting and Oversight of Maintenance for Soil Treatment Area Reductions And Vertical and Horizontal Separation Distance Reductions Based on Use of Higher Level Treatment:**

1. *Soil Treatment Area Reductions and Vertical and Horizontal Separation Distance Reductions Based on Use of Higher Level Treatment is not allowed in Fremont County.*

E. **Monitoring and Sampling:**

1. Sampling may be required by the Fremont County Public Health Agency in conjunction with an enforcement action or to ensure compliance with the provisions of this regulation, as provided in E.3 below.

   a. Sampling and analysis must be performed according to the American Public Health Association, the American Water Works Association, and the Water Environment Federation: Standard Methods for the Examination of Water and Wastewater, 24nd edition, 2022 (International Standard Book Number: ISBN – 10: 0875532993, ISBN – 13: 978-0875532998)

2. Any owner or occupant of property on which an OWTS is located may request the Fremont County Public Health Agency to collect and test an effluent sample from the system. The Fremont County Public Health Agency may perform such collection and testing services. The owner or occupant must pay the cost for these services.

   a. If the Fremont County Public Health Agency or a delegated third party collects and tests effluent samples, a fee not to exceed that which is allowed by the OWTS Act may be charged for each sample collected and tested. Payment of such charge must be stated in the permit as a condition for its continued use.

3. Conditions that provide for the Fremont County Public Health Agency to require water quality routine monitoring include:

   (a) Indications of inadequate performance;
   (b) Location in sensitive areas;
   (c) Systems designed to meet TL3ND standards;
   (d) Treatment systems other than those discharging through a soil treatment area or sand filter system (12.G);
   (e) Remediation systems; and/or

(f) Systems under use permits (4.M), or product development permits (4.I).

15. Severability

The provisions of this regulation are severable, and if any provisions or the application of the provisions to any circumstances are held invalid, the application of such provision to other circumstances, and the remainder of this regulation will not be affected thereby.

16. Materials Incorporated by Reference

Throughout these regulations, standards and requirements by outside organizations have been adopted and incorporated by reference. The materials incorporated by reference cited herein include only those versions that were in effect as of March 10, 2024, and not later amendments to the incorporated material.

Materials incorporated by reference are available for public inspection during normal business hours from the Water Quality Control Division, 4300 Cherry Creek Drive South, Denver, Colorado 80246. Copies may be purchased from the source organizations listed below.

AASHTO, American Association of State Highway and Transportation Officials
555 12th Street, Suite 1000
Washington, DC 200014 Phone: 202-624-5800
Email: info@aashto.org
www.transportation.org

ANSI, American National Standards Institute
1899 L Street, NW, 11th Floor
Washington, DC 20036
Phone: 212.642.4980
www.ansi.org

ASTM, American Society for Testing and Materials
ASTM International
100 Barr Harbor Drive
PO Box C700
West Conshohocken, PA 19428-2959 Phone: 610.832.9500
Email: service@astm.org
www.astm.org

CPOW, Colorado Professionals in Onsite Wastewater
P.O. Box 918
Strasburg, CO 80136
Phone: 720-626-8989
www.cpow.net

CSA, Canadian Standards Association
CSA Group Testing and Certification Inc.
178 Rexdale Boulevard
Toronto, Ontario M9W 1R3
Canada
Phone: 800-463-6727
Email: sales@csagroup.org
www.csagroup.org

ETL, Electrical Testing Laboratories
The ETL Listed Mark is from Intertek Testing Services NA, Inc. (ITSNA)
545 East Algonquin Road, Suite F
Arlington Heights, Illinois 60005
Phone: 800 967 5352
www.intertek.com

IAPMO, International Association of Plumbing and Mechanical Officials
International Association of Plumbing and Mechanical Officials EGS (IAPMO)
4755 East Philadelphia Street
Ontario, CA 91761
Phone: 909-472-4100
Email: iapmo@iapmo.org
www.iapmo.org

NPCA, National Precast Concrete Association
1320 City Center Drive, Suite 200
Carmel, IN 46032
Phone: 800-366-7731
www.precast.org

NSF, International

NSF International (NSF)
789 North Dixboro Road
Ann Arbor, Michigan 48105
Phone: 734-769-8010
Email: info@nsf.org
www.nsf.org

UL Underwriters Laboratories

Underwriters Laboratories Inc.
333 Pfingsten Road
Northbrook, Illinois 60062
Phone: 847.272.8800
Email: CustomerExperienceCenter@ul.com
www.ul.com

Standard Methods for the Examination of Water and Wastewater, 21st4th edition.

A joint publication of the American Public Health Association, American Water Works Association, and Water Environment Federation
Phone: 877-574-1233
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