State of Utah
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Department of
Environmental Quality

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DIVISION OF WATER QUALITY
John K. Mackey, P.E.
Director

MEMORANDUM

DATE: March 22, 2023

TO: Utah Water Quality Board

THROUGH: John Mackey, Director

FROM: Robert Beers, Onsite Wastewater Program

SUBJECT: Request to initiate rulemaking to revise and amend Utah Administrative Code, Rule 317-4. Onsite Wastewater Systems.

The purpose of this memorandum is to request authorization from the Utah Water Quality Board (Board) to initiate rulemaking to revise and amend Utah Administrative Code Rule 317-4. The proposed revision was drafted jointly by Local Health Departments (LHDs) and Division of Water Quality (Division) staff. The request for revision is being made at the request of the LHDs officials, which administer Rule *R317-4. Onsite Wastewater Systems* for the State, in conjunction with the Division. The LHDs have reviewed the draft rules and during the February 28, 2023 Department of Environmental Quality governance meeting the LHDs requested the Division initiate rulemaking. Thus, the Division is making this request to revise the R317-4 to include additions related to membrane bioreactors (MBR), as a class of alternative wastewater systems not in the current Rule. The revision also includes updating as recommended in the *Rulewriting Manual for Utah, 12th Edition*.

These systems treat wastewater differently than current methods allowed in Rule and have been installed in other states for many years. Two systems have been permitted by the Summit County Health Department as experimental systems and have been installed and operating successfully in Summit County since June 2021. An updated rule will allow each LHD, at their discretion, to permit these systems as alternative onsite wastewater systems under their existing onsite programs, without additional program management costs. The proper installation and operation of MBR onsite wastewater systems is expected to produce effluent with reduced contaminants when compared to conventional systems. The proposed draft will list design criteria, installation specifications, operating parameters, and monitoring requirements.

Following any revisions, the Board requests, the proposed draft rule will be submitted for review by the Governor's Office and for public comment. In addition, the proposed rule will be shared with the Utah State University Onsite Wastewater Treatment Training Program.

Division staff recommends that the Board authorize initiation of rulemaking to revise and amend UAC R317-4. Attachment 1 has a redline-strikeout version of the proposed rule for Board review.

DWQ-2023-003897
File: P:\WQ\DWQDatabases\OnsiteWastewater\Rulemaking\R317-4 Onsite Wastewater Systems DRAFT including MBR

Attachment 1
Redline/Strikeout of Proposed Change to R317-101-3 Utah Water Quality Board Meeting

R317. Environmental Quality, Water Quality.
R317-4. Onsite Wastewater Systems.
R317-4-1. Authority, Purpose, Scope, and Administrative Requirements.

(1) Authorization.
These rules are administered by the division authorized by Title 19 Chapter 5.
(2) Purpose.
The purpose of this rule is to protect the public health and environment from potential adverse effects from onsite wastewater disposal within the boundaries of Utah.
(3) Scope.
This rule shall apply to onsite wastewater systems.
(4) Jurisdiction.
Local health departments have jurisdiction to administer this rule. Nothing contained in this rule shall be construed to prevent local health departments from:
(a) adopting stricter requirements than those contained herein;
(b) issuing an operating permit, with a term not exceeding five years, with an inspection showing a satisfactory performance of the permitted system by the department's staff before renewal;
(c) taking necessary steps for groundwater quality protection:
(i) through adoption of a groundwater quality protection management policy based on a groundwater management study; or
(ii) by an onsite wastewater systems management planning policy and land use planning through the county's agency;
(d) prohibiting any alternative system within its jurisdiction;
(e) assessing fees for administration of this rule;
(f) requiring the onsite systems within its jurisdiction be placed under an umbrella of a:
(i) responsible management entity overseen by the local health department;
(ii) contract service provider overseen by the local health department; or
(iii) management district body politic created by the county for the purpose of operation, maintenance, repairs and monitoring of alternative or all onsite wastewater systems;
(g) requiring conventional and alternative systems to be serviced; and
(h) receiving a request for a variance, conducting a review, and granting either an approval or denial.
(5) Alternative System Administration.
Local health departments shall administer an alternative systems program.
(a) The local board of health may restrict its administration of these systems by notifying the division that it is exempt from this requirement by:
(i) adopting a resolution or regulation; or
(ii) presenting an ordinance.
(b) An alternative systems program shall:
(i) advise the owner of the:
(A) type of alternative system;
(B) information concerning risk of failure;
(C) level of maintenance required;
(D) financial liability for repair, modification or replacement of a failed system; and
(E) periodic monitoring requirements;
(ii) ensure that a Notice of the existence of the alternative system is recorded in the chain of title for that property;
(iii) provide oversight of installed alternative systems;
(iv) inspect all installed alternative systems at frequency specified in this rule, through:
(A) the department's staff;
(B) contracted service providers;
(C) responsible management entities;
(D) a management district body politic created by the county for the purpose of managing onsite wastewater systems; or
(E) any combination of the above options;

(v) maintain records of all installed alternative systems, failures, modifications, repairs and all inspections, recording the condition of the system at the time of inspection, such as overflow, surfacing, ponding, and nuisance;

(vi) submit an annual report to the division on or before September 1 for the previous state of Utah fiscal year's activities showing:

(A) the type and number of alternative systems approved, installed, modified, repaired, failed, and inspected;

(B) a summary of enforcement actions taken, pending and resolved; and

(C) a summary of performance of water quality data collected;

(vii) require all alternative systems to be inspected and serviced as detailed in Section R317-4-13 Table 7 and Section R317-4-11. (6) Variance Administration Authority.

The Water Quality Board delegates the authority to grant or deny variances to the design requirements provided for in this rule to the local health departments. The board may amend, suspend, or rescind this delegation of authority to a local health department if it is determined that the local health department is not accepting or conducting reviews as described in Section R317-4-12.

(a) The local health department having jurisdiction shall accept applications for variance requests on lots that are deemed not feasible for permitting an onsite wastewater system. Upon completion of a review, the local health department will grant or deny a variance to this rule as outlined in Section R317-4-12. The local health department also will submit an annual report of completed variance determinations to the division.

(b) If a local health department fails to evaluate variance requests according to Section R317-4-12, the director shall notify the local health department. The director on behalf of the board may thereafter amend, suspend, or rescind the delegation of variance authority to the local health department. The variance authority would then revert to the division, and requests will be reviewed as follows.

(i) The director may appoint a variance advisory committee to consider variance requests and make recommendations to the director. Any such advisory committee shall include at least one representative from a local health department. The director may refer any variance request to the variance advisory committee.

(ii) Upon review of the recommendation submitted by the variance advisory committee, the director shall render a written determination of the requested variance. If no committee was appointed by the director, the director shall render a written determination. Written determinations must be given within 180 days of the receipt of a complete and technically adequate variance request.

(iii) The director's final written determination will be forwarded to the local health department that has jurisdiction. The local health department is not required to approve or deny an operating or construction permit based on the director's determination of a variance request.

R317-4-2. Definitions.

(1) "Absorption area" means the entire area used for the subsurface treatment and dispersion of effluent by an absorption system.

(2) "Absorption bed" means an absorption system consisting of large excavated areas utilizing drain media or chambers.

(3) "Absorption system" means a covered system constructed to receive and to disperse effluent, from gravity or a pump, in such a manner that the effluent is effectively filtered and retained below the ground surface.

(4) "Absorption trench" means an absorption system consisting of a series of narrow excavated trenches utilizing drain media, chambers, or bundled synthetic aggregate units.

(5) "Alternative onsite wastewater system" means an onsite wastewater system that is not a conventional onsite wastewater system.

(6) "At-grade system" means an alternative onsite wastewater system where the bottom of the absorption system is placed at or below the elevation of the existing site grade, and the top of the distribution pipe is above the elevation of existing site grade, and the absorption system is contained within fill that extends above that grade.

(7) "Barrier material" means an effective, pervious material such as an acceptable synthetic filter fabric, or a two-inch layer of compacted straw.

(8) "Bedrock" means the rock, usually solid, that underlies soil or other unconsolidated, superficial material.

(9) "Bedroom" means any portion of a dwelling that is so designed as to furnish the minimum isolation necessary for use as a sleeping area. It may include a den, study, sewing room, or sleeping loft. Unfinished basements shall be counted as a minimum of one additional bedroom.

(10) "Board" means the Utah Water Quality Board.

(11) "Body politic" means the state or its agencies or any political subdivision of the state to include a county, city, town, improvement district, taxing district or other governmental subdivision or public corporation of the state.

(12) "Building sewer" means the pipe that carries wastewater from the building to a public sewer, an onsite wastewater system or other point of dispersal. It is synonymous with "house sewer".
(13) "Bundled synthetic aggregate trench" means an absorption trench utilizing bundled synthetic aggregate units.
(14) "Bundled synthetic aggregate unit" means a cylindrically shaped manufactured unit of synthetic aggregate enclosed in polyolefin netting, which may contain a perforated pipe.
(15) "Chamber" means an open bottom, chambered structure of an approved material and design.
(16) "Chambered trench" means an absorption trench utilizing chambers.
(17) "Cleanout" means a device designed to provide access for removal of deposited or accumulated materials, generally from a pipe.
(18) "Closed loop distribution" means a distribution method where the absorption system layout has the inlet and outlet ends of each lateral connected creating a complete and continuous pathway for effluent flow.
(19) "Coarse drain media" means drain media ranging from 3/4 to 12 inches in diameter.
(20) "Condominium" means the ownership of a single unit in a multi-unit project together with an undivided interest in common, in the common areas and facilities of the property.
(21) "Connecting trench" means an absorption trench that is used to connect other absorption trenches, is less than 20 feet in length, and may be used to calculate total required absorption area.
(22) "Construction permit" means the permit that authorizes an onsite wastewater system to be installed according to an approved design. An additional construction permit may also authorize activities associated with the repair or alteration of a malfunctioning or failing system.
(23) "Conventional onsite wastewater system" means an onsite wastewater system typically consisting of a building sewer, a septic tank, and an absorption system utilizing absorption trenches, absorption beds, deep wall trenches, or seepage pits.
(24) "Cover" means soils used to overlay the absorption area that is free of large stones 10 inches diameter or larger, frozen clumps of earth, masonry, stumps, or waste construction material, or other materials that could damage the system.
(25) "Curtain drain" means any groundwater interceptor or drainage system that is backfilled with gravel or other suitable material and is intended to interrupt or divert the course of shallow groundwater or surface water away from the onsite wastewater system.
(26) "Designer" means a person who fulfills the requirements of Rule R317-11.
(27) "Deep wall trench" means an absorption system consisting of deep excavated trenches utilizing coarse drain media, with a minimum sidewall absorption depth of 24 inches of suitable soil formation below the distribution pipe.
(28) "Director" means the director of the Division of Water Quality or, for purposes of groundwater quality at a facility licensed by and under the Division of Radiation Control, the director of the Division of Radiation Control.
(29) "Distribution box" means a watertight structure that receives effluent and distributes it concurrently, in essentially equal portions, into two or more pipes leading to an absorption system.
(30) "Distribution pipe" means an approved pipe, solid or perforated, used in the dispersion of effluent in an absorption system.
(31) "Diversion valve" means a watertight structure that receives effluent through one inlet and distributes it to two or more outlets, only one of which is used at a time.
(32) "Division" means the Utah Division of Water Quality.
(33) "Domestic wastewater" means a combination of the liquid or water-carried wastes from residences, business buildings, institutions, and other establishments with installed plumbing facilities, excluding non-domestic wastewater. It is synonymous with the term "sewage".
(34) "Drain media" means media used in an absorption system. It shall consist of stone, crushed stone, or gravel, ranging from 3/4 to 2-1/2 inches in diameter. It shall be free from fines, dust, sand or organic material and shall be durable and inert so that it will maintain its integrity, will not collapse or disintegrate with time. The maximum fines in the media shall be 2% by weight passing through a US Standard #10 mesh or 2 millimeter sieve. It shall be protected by a barrier material.
(35) "Drainage system" means all the piping within public or private premises that conveys sewage or other liquid wastes to a legal point of treatment and dispersal, but does not include the mains of a public sewer system or a public sewage treatment or disposal plant.
(36) "Drop box" means a watertight structure that receives septic tank effluent and distributes it into one or more distribution pipes, and into an overflow leading to another drop box and absorption system located at a lower elevation.

(37) "Dry wash" means the dry bed of an ephemeral stream that flows only after heavy rains and is often found at the bottom of a canyon.
(38) "Dwelling" means any structure, building, or any portion thereof that is used, intended, or designed to be occupied for human living purposes including houses, mobile homes, hotels, motels, and apartments.
(39) "Effluent" means the liquid discharge from any treatment unit including a septic tank.
(40) "Effluent pump" means a pump used to lift effluent.
(41) "Effluent sewer" means solid pipe that carries effluent to the absorption system.
(42) "Ejector pump" means a device to elevate or pump sewage to a septic tank, public sewer, or other means of disposal.
(43) "Ephemeral stream" means a stream that flows for a small period of time, a week or less, after a precipitation event.
(44) "Excessively permeable soil" means soils having an excessively high permeability, such as cobbles or gravels with little fines and large voids, and having a percolation rate faster than 1 minute per inch.
(45) "Experimental onsite wastewater system" means an onsite wastewater treatment and absorption system that is still in experimental use and requires further testing in order to provide sufficient information to determine its acceptance.
(46) "Filter fabric" means a synthetic, non-degradable woven or spun-bonded sheet material that has adequate tensile strength to prevent ripping during installation and backfilling, adequate permeability to allow free passage of water and gases; and adequate particle retention to prevent downward migration of soil particles into the absorption system. The minimum physical properties for the fabric shall be 4.0 ounces per square yard or equivalent.
(47) "Groundwater" means that portion of subsurface water that is in the zone of soil saturation.
(48) "Groundwater table" means the surface of a body of unconfined groundwater in which the pressure is equal to that of the atmosphere.
(49) "Groundwater table, perched" means unconfined groundwater separated from an underlying body of groundwater by an unsaturated zone. It is underlain by a restrictive strata or impervious layer. Perched groundwater may be either permanent, where recharge is frequent enough to maintain a saturated zone above the perching bed, or temporary, where intermittent recharge is not great or frequent enough to prevent the perched water from disappearing from time to time as a result of drainage over the edge of or through the perching bed.
(50) "Gulch" means a small rocky ravine or a narrow gorge, especially one with an ephemeral stream running through it.
(51) "Gully" means a channel or small valley, especially one carved out by persistent heavy rainfall or an ephemeral stream.
(52) "Impervious strata" means a layer that prevents water or root penetration. In addition, it shall be defined as unsuitable soils or soils having a percolation rate slower than 60 minutes per inch for conventional systems.
(53) "Installer" means a qualified person with an appropriate contractor's license and knowledgeable in the installation or repair of an onsite wastewater system or its components.
(54) "Intermittent stream" means a stream that flows for a period longer than an ephemeral stream on a seasonal basis or after a precipitation event.
(55) "Invert" means the lowest portion of the internal cross section of a pipe or fitting.
(56) "Large Underground Wastewater Disposal System" means an onsite wastewater system that is designed to receive wastewater flows that may exceed more than 5,000 gallons per day, and may be designed to serve multiple dwelling units that are owned by separate owners except condominiums. A large underground wastewater disposal system usually consists of a building sewer, a septic tank and an absorption system.
"Lateral" means a length of distribution pipe or chambered trenches in the absorption system.
(57) "Local health department" means a county or multi-county local health department established under Title 26A.
(58) "Lot" means a portion of a subdivision, or any other parcel of land intended as a unit for transfer of ownership or for development or both and may not include any part of the right-of-way of a street or road.
(59) "Malfunctioning or failing system" means an onsite wastewater system that is not functioning in compliance with the requirements of this regulation and may include:
(a) absorption systems that seep or flow to the surface of the ground or into waters of the state;
(b) systems that overflow from any of their components;
(c) systems that, due to failure to operate in accordance with their designed operation, cause backflow into any portion of a building drainage system;
(d) systems discharging effluent that does not comply with applicable effluent discharge standards;
(e) leaking septic tanks; or

(f) noncompliance with standards stipulated on or by the construction permit, operating permit, or both.
(60) "Maximum groundwater table" means the highest elevation that the top of the "groundwater table" or "groundwater table, perched" is expected to reach for any reason over the full operating life of the onsite wastewater system at that site.
(61) "May" means discretionary, permissive, or allowed.
(62) "Membrane Bioreactor" means an alternative onsite wastewater system that includes both biological processes and mechanical filtration processes to treat septic tank effluent prior to discharge to an absorption system. Membrane bioreactor units include a balance tank, an aeration tank, and filtration tanks. All tanks are interconnected with aeration pumps and recirculation lines.
(63) "Mound system" means an alternative onsite wastewater system where the bottom of the absorption system is placed above the elevation of the original site, and the absorption system is contained in a mounded fill body above that grade.
(64) "Non-closed loop distribution" means a distribution method where the absorption system layout has lateral ends that are not connected.
(65) "Non-domestic effluent" means the liquid discharge from any treatment unit including a septic tank that has a BOD5 equal or greater than 250 mg/L; or TSS equal to or greater than 145 mg/L; or fats, oils, and grease equal to or greater than 25 mg/L.
(66) "Non-domestic wastewater" means process wastewater originating from the manufacture of specific products. Such wastewater is usually more concentrated, more variable in content and rate, and requires more extensive or different treatment than domestic wastewater.
(67) "Non-public water source" means a culinary water source that is not defined as a public water source.
(68) "Non-residential" means a building that produces domestic wastewater, and is not a single-family dwelling.
(69) "Onsite wastewater system" means an underground wastewater dispersal system that is designed for a capacity of 5,000 gallons per day or less, and is not designed to serve multiple dwelling units that are owned by separate owners except condominiums. It usually consists of a building sewer, a septic tank and an absorption system.
(70) "Operating permit" means the permit that authorizes the operation and maintenance of an onsite wastewater system or wastewater holding tank. It may have a fee component that requires periodic renewal.
(71) "Packed bed media system" means an alternative onsite wastewater system that uses natural or synthetic media to treat wastewater. Biological treatment is facilitated via microbial growth on the surface of the media. The system may include a pump tank, a recirculation tank, or both.
(72) "Percolation rate" means the time expressed in minutes per inch required for water to seep into saturated soil at a constant rate during a percolation test.
(73) "Percolation test" means the method used to measure the permeability of the soil by measuring the percolation rate as described in these rules. This is sometimes referred to as a "perc test".
(74) "Permeability" means the rate at which a soil transmits water when saturated.
(75) "Person" means an individual, trust, firm, estate, company, corporation, partnership, association, state, state or federal agency or entity, municipality, commission, or political subdivision of a state as defined in Section 19-1-103.
(76) "Pollution" means any man-made or man-induced alteration of the chemical, physical, biological, or radiological integrity of any waters of the state, unless the alteration is necessary for public health and safety as defined in Section 19-5-102.
(77) "Pressure distribution" means a method designed to uniformly distribute effluent under pressure within an absorption system.
(78) "Public health hazard" means, for the purpose of this rule, a condition whereby there are sufficient types and amounts of biological, chemical, or physical agents relating to water or sewage that are likely to cause human illness, disorders or disability. These may include pathogenic viruses and bacteria, parasites, toxic chemicals and radioactive isotopes. A malfunctioning onsite wastewater system constitutes a public health hazard.
(79) "Public water source" means a culinary water source, either publicly or privately owned, providing water for human consumption and other domestic uses, as defined in Title R309.
(80) "Pump tank" means a watertight receptacle equipped with a pump and placed after a septic tank or other treatment component.
(81) "Pump vault" means a device installed in a septic or pump tank that houses a pump and screens effluent with 1/8 inch openings or smaller before it enters the pump.
(82) "Recirculation tank" means the tank that receives, stores, and recycles partially treated effluent and recycles that effluent back through the treatment process or to the absorption area.

(83) "Regulatory authority" means either the Utah Division of Water Quality or the local health department having jurisdiction.
(84) "Replacement area" means sufficient land with suitable soil, excluding streets, roads, easements and permanent structures that complies with the setback requirements of these rules, and is intended for the 100% replacement of absorption systems.
(85) "Rotary tilling" means a tillage operation. Working land by plowing and harrowing in order to make land ready for cultivation, or employing power driven rotary motion of the tillage tool to loosen, shatter and mix soil.
(86) "Sand lined trench system" means an alternative onsite wastewater system consisting of a series of narrow excavated trenches utilizing sand media and pressure distribution.
(87) "Sand media" means sand fill meeting the ASTM C33/C33M - 11A Standard Specification for Concrete Aggregates.
(88) "Saprolite" means weathered material underlying the soil that grades from soft thoroughly decomposed rock to rock that has been weathered sufficiently so that it can be broken in the hands, cut with a knife or easily dug with a backhoe and is devoid of expansive clay. It has rock structure instead of soil structure and does not include hard bedrock or hard fractured bedrock.
(89) "Scarification" means loosening and breaking up of soil compaction in a manner that prevents smearing and maintains soil structure.
(90) "Scum" means a mass of sewage solids, which is buoyed up by entrained gas, grease, or other substances, floating on the surface of wastes in a septic tank.
(91) "Seepage pit" means an absorption system consisting of one or more deep excavated pits, either hollow-lined or filled, utilizing coarse drain media, with a minimum sidewall absorption depth of 48 inches of suitable soil formation below the distribution pipe.
(92) "Septage" means the semi-liquid material that is pumped out of a septic or pump tank, generally consisting of the sludge, liquid, and scum layer.
(93) "Septic tank" means a watertight receptacle that receives the discharge of a drainage system or part thereof, designed and constructed so as to retain solids, digest organic matter through a period of detention and allow the liquids to discharge into the soil outside of the tank through an absorption system.
(94) "Sequential distribution" means a distribution method in which effluent does not pass through an absorption area before it enters the succeeding areas through a distribution box or relief line allowing for portions of the absorption area to be isolated.
(95) "Serial distribution" means a distribution method in which effluent passes through an absorption area before entering the succeeding areas through a distribution box or relief line creating a single uninterrupted flow path.
(96) "Shall" means a mandatory requirement.
(97) "Should" means recommended or preferred and is intended to mean a desirable standard.
(98) "Single-family dwelling" means a building designed to be used as a home by the owner or lessee of such building.
(99) "Sludge" means the accumulation of solids that have settled in a septic tank or a wastewater holding tank.
(100) "Slope" means the ratio of the rise divided by the run between two points, typically described as a percentage (rise divided by run multiplied by 100).
(101) "Soil exploration pit" means an open pit dug to permit examination of the soil to evaluate its suitability for absorption systems. This is also referred to as a "test pit".
(102) "Soil log" means a detailed description of soil characteristics and properties.
(103) "Soil structure" means the way in which the individual particles, sand, silt, and clay, are arranged into larger distinct aggregates called peds. The main types of soil structure are granular, platy, blocky, prismatic, and columnar. Soil may not have a visible structure because it is either single grain or massive.
(104) "Soil texture" means the percent of sand, silt, and clay in a soil mixture. Field methods for judging the texture of a soil are found in Section R317-4-14 Appendix C.
(105) "Standard trench" means an absorption trench utilizing drain media into which effluent is discharged through specially designed distribution pipes.
(106) "Suitable soil" means undisturbed soil that through textural and structural analysis or percolation rate meets the requirements for placement of an absorption system.
(107) "Test pit" see "soil exploration pit".
(108) "Unapproved system" means any onsite wastewater system that is deemed by the regulatory authority to be any:
(a) installation without the required regulatory oversight, permits, or inspections;
(b) repairs to an existing system without the required regulatory oversight, permits, or inspections; or
(c) alteration to an existing system without the required regulatory oversight, permits, or inspections.

(109) "USDA system of classification" means the system of classifying soil texture used by the United States Department of Agriculture.
(110) "Waste" means dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water as defined in Section 19-5-102.
(111) "Wastewater" means sewage, industrial waste or other liquid substances that might cause pollution of waters of the state. Intercepted groundwater that is uncontaminated by wastes is not included.
(112) "Wastewater holding tank" means a watertight receptacle designed to receive and store wastewater to facilitate treatment at another location.
(113) "Waters of the state" means all streams, lakes, ponds, marshes, water-courses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private, which are contained within, flow through, or border upon this state or any portion thereof, except that bodies of water confined to and retained within the limits of private property, and which do not develop into or constitute a nuisance, or a public health hazard, or a menace to fish and wildlife, shall not be considered to be "waters of the state" under this definition (Section 19-5-102).
(114) "Wind-blown sand" means sand that is formed by the weathering and erosion of sandstone typically found in sand-dune or sand-sheet deposits and is capable of producing sand and dust storms when disturbed.

R317-4-3. General Standards, Prohibitions, Requirements, and Enforcement.

(1) Failure to Comply with Rules.
Any person failing to comply with this rule shall be subject to enforcement action as specified in Sections 19-5-115 and 26A-1-123.
(2) Feasibility.
Any onsite wastewater system may not be feasible in some areas and situations. If property characteristics indicate conditions that may fail in any way to meet the requirements specified in this rule, the use of an onsite wastewater system shall be prohibited.
(3) Onsite Wastewater System Required.
The drainage system of each dwelling, building or premises covered in this rule shall receive all wastewater, including bathroom, kitchen, and laundry wastes, and shall have a connection to a public sewer except when such sewer is not available or practicable for use, in which case connection shall be made:
(a) to an onsite wastewater system found to be adequate and constructed in accordance with this rule; or
(b) to any other type of wastewater system acceptable under Rules R317-1, R317-3, R317-5, R317-401, or R317-560.
(4) Flows Prohibited from Entering Onsite Wastewater Systems.
No groundwater drainage, drainage from roofs, roads, yards, or other similar sources shall discharge into any portion of an onsite wastewater system, but shall be disposed of so they will in no way affect the system. Non-domestic wastes such as chemicals, paints, or other substances that are detrimental to the proper functioning of an onsite wastewater system may not be disposed of in such systems.
(5) Increased Flows Prohibited.
A person may not connect or expand the use of a single-family dwelling or nonresidential facility connected to an existing onsite wastewater system if the projected wastewater flows would be greater than the original design flow. When the design flow is exceeded, expansion may occur if the onsite wastewater system is modified, permitted, and approved by the regulatory authority for the increased flow.
(6) Material Standards.
All materials used in onsite wastewater systems shall comply with the standards in this rule.
(7) Property Lines Crossed.
Any onsite wastewater system, including replacement areas, shall be located on the same lot as the building served unless, when approved by the regulatory authority, a perpetual utility easement and right-of-way is established on an adjacent or nearby lot for the construction, operation, and continued maintenance, repair, alteration, inspection, relocation, and replacement of an onsite wastewater system, including all rights to ingress and egress necessary or convenient for the full or complete use, occupation, and enjoyment of the granted easement. The easement shall be large enough to accommodate the proposed onsite wastewater system and replacement area. The easement shall meet the setbacks specified in Section R317-4-13 Table 2.
(8) Initial Absorption Area and Replacement Area.
(a) All properties that utilize onsite wastewater systems shall be required to have a replacement area.

(b) The absorption area, including installed system and replacement area, may not be subject to activity that is likely to adversely affect the soil or the functioning of the system. This may include vehicular traffic, covering the area with asphalt, concrete, or structures, filling, cutting or other soil modifications.
(9) Operation and Maintenance.
Owners of onsite wastewater systems shall operate, maintain, and service their systems according to the standards of this rule.
(10) No Discharge to Surface Waters or Ground Surface.
Effluent from any onsite wastewater system may not be discharged to surface waters or upon the surface of the ground. Wastewater may not be discharged into any abandoned or unused well, or into any crevice, sinkhole, or similar opening, either natural or artificial.
(11) Repair of a Malfunctioning or Unapproved System.
Upon determination by the regulatory authority that a malfunctioning or unapproved onsite wastewater system creates or contributes to any dangerous or unsanitary condition that may involve a public health hazard, or noncompliance with this rule, the regulatory authority shall order the owner to take the necessary action to cause the condition to be corrected, eliminated or otherwise come into compliance.
(a) For malfunctioning systems, the local health department shall require and order:
(i) all necessary steps, such as maintenance, servicing, repairs, and replacement of system components to correct the malfunctioning system, to meet all rule requirements to the extent possible and may not create any new risk to the environment or public health;
(ii) effluent quality testing as required by Subsection R317-4-11(4);
(iii) evaluation of the system design including non-approved changes to the system, the wastewater flow, and biological and chemical loading to the system;
(iv) additional tests or samples to troubleshoot the system malfunction.
(b) The regulatory authority may require fees for additional inspections, reviews, and testing.
(12) Procedure for Wastewater System Abandonment.
(a) When a dwelling served by an onsite wastewater system is connected to a public sewer, the septic tank shall be abandoned and shall be disconnected from and bypassed with the building sewer unless otherwise approved by the regulatory authority.
(b) Whenever the use of an onsite wastewater system has been abandoned or discontinued, the owner of the real property on which such wastewater system is located shall render it safe by having the septic tank, any other tanks, hollow seepage pit, or cesspool wastes pumped out or otherwise disposed of in an approved manner. Within 30 days the tanks shall be:
(i) crushed in place and the void filled;(ii) completely filled with earth, sand, or gravel; or
(iii) removed.
(c) The regulatory authority may require oversight, permit, or inspection of the abandonment process.
(13) Septage Management.
A person shall only dispose of septage, or sewage contaminated materials in a location or manner in accordance with the regulations of the division and the local health department having jurisdiction.
(14) Multiple Dwelling Units.
Multiple dwelling units under individual ownership, except condominiums, may not be served by a single onsite wastewater system except where that system is under the sponsorship of a body politic. Plans and specifications for such systems shall be submitted to and approved by the division. Issuance of a construction permit by the board shall constitute approval of plans and authorization for construction. Before the permit is issued, the division shall review plans with the local health department having jurisdiction over the proposed onsite wastewater system.

R317-4-4. Feasibility Determination.

(1) General Criteria for Determining Onsite Wastewater System Feasibility.
The regulatory authority shall determine the feasibility of using an onsite wastewater system. The regulatory authority will review required information for any existing or proposed lot to determine onsite wastewater system feasibility. The required information shall be prepared at the owner's expense by, or under the supervision of, a qualified person approved by the regulatory authority.
(a) General Information.
The required information shall include:
(i) the county recorder's plat and parcel ID and situs address if available;
(ii) name and address of the property owner and person requesting feasibility; and

(iii) the location, type, and depth of all existing and proposed non-public water supply sources within 200 feet of the proposed onsite wastewater systems, and of all existing or proposed public water supply sources within 1,500 feet of the proposed onsite wastewater systems.
(A) If the lot is located in aquifer recharge areas or areas of other particular geologic concern, the regulatory authority may require such additional information relative to groundwater movement, or possible subsurface wastewater flow.
(B) If the proposed onsite wastewater system is located within any drinking water source protection zone two, this zone shall be shown.
(iv) The location and distance to nearest sewer, owner of sewer, whether property is located within service boundary, and size of sewer.
(v) Statement of proposed use if other than a single-family dwelling.
(b) Soil and Site Evaluation.
(i) Soil Exploration Pit and Percolation Test.
(A) A minimum of one soil exploration pit shall be excavated to allow the evaluation of the soil. The soil exploration pit shall be constructed and soil log recorded as detailed in Section R317-4-14 Appendix C.
(B) The regulatory authority shall have the option of requiring a percolation test in addition to the soil exploration pit.
(C) The regulatory authority:
(I) shall require additional soil exploration pits, percolation tests, or both where flows are greater than 1,000 gallons per day; and
(II) may require additional pits, tests, or both where:
(II.a) soil structure varies;
(II.b) limiting geologic conditions are encountered; or
(II.c) the regulatory authority deems it necessary.
(D) The percolation test shall be conducted as detailed in Section R317-4-14 Appendix D.
(E) Soil exploration pits and percolation tests shall be conducted as closely as possible to the proposed absorption system site. The regulatory authority shall have the option of inspecting the open soil exploration pits and monitoring the percolation test procedure. All soil logs and percolation test results shall be submitted to the regulatory authority.
(F) When there is a substantial discrepancy between the percolation rate and the soil classification, it shall be resolved through additional soil exploration pits, percolation tests, or both.
(G) Absorption system feasibility shall be based on Section R317-4-13 Table 5 or 6.
(ii) Wind-Blown Sand.
The extremely fine grained wind-blown sand found in some parts of Utah shall be deemed not feasible for absorption systems. This does not apply to lots that have received final local health department approval prior to the effective date of this rule.
(A) Percolation test results in wind-blown sand will generally be rapid, but experience has shown that this soil tends to become sealed with minute organic particles within a short period of time. For lots that have received final local health department approval prior to the effective date of this rule, systems may be constructed in such material provided it is found to be within the required range of percolation rates specified in these rules, and provided further that the required area shall be calculated on the assumption of minimum acceptable percolation rate of 60 minutes per inch for standard trenches, deep wall trenches, and seepage pits, and 40 minutes per inch for absorption beds.
(iii) Suitable Soil Depth.
For conventional systems, effective suitable soil depth shall extend at least 48 inches or more below the bottom of the dispersal system to bedrock formations, impervious strata, or excessively permeable soil. Some alternative onsite wastewater systems may have other requirements.
(iv) Groundwater Requirements.
The elevation of the anticipated maximum groundwater table shall meet the separation requirements of the anticipated absorption systems. Local health departments and other local government entities may impose stricter separation requirements between absorption systems and the maximum groundwater table when deemed necessary. Building lots recorded or having received final local health department approval prior to May 21, 1984 shall be subject to the groundwater table separation requirements of the then Part IV of the Code of Waste Disposal Regulations dated June 21, 1967, that states "high groundwater elevation shall be at least 1 foot below the bottom of absorption systems and at least 4 feet below finished grade". Notwithstanding this grandfather provision for recorded or other approved lots, the depth to groundwater requirements are applicable if compelling

or countervailing public health interests would necessitate application of the more stringent requirements of this regulation.
(A) Maximum Groundwater.
Maximum groundwater table shall be determined where the anticipated maximum groundwater table, including irrigation induced water table, might be expected to rise closer than 48 inches to the elevation of the bottom of the onsite wastewater system. Maximum groundwater table shall be determined where alternative onsite wastewater systems may be considered based on groundwater elevations. The maximum groundwater table shall be determined by the following.
(I) Regular monitoring of the groundwater table, or groundwater table, perched, in an observation well for a period of one year, or for the period of the maximum groundwater table.
(I.a) Previous groundwater records and climatological or other information may be consulted for each site proposed for an onsite wastewater system and may be used to adjust the observed maximum groundwater table elevation.
(II) Direct visual observation of the maximum groundwater table in a soil exploration pit for:
(II.a) evidence of crystals of salt left by the maximum groundwater table; or
(II.b) chemically reduced iron in the soil, reflected by redoximorphic features, i.e. a mottled coloring.
(II.c) Previous groundwater records and climatological or other information may be consulted for each site proposed for an onsite wastewater system and may be used to adjust the observed maximum groundwater table elevation in determining the anticipated maximum groundwater table elevation.
(III) In cases where the anticipated maximum groundwater table is expected to rise to closer than 34 inches from the original ground surface and an alternative or experimental onsite wastewater system would be considered, previous groundwater records and climatological or other information shall be used to adjust the observed maximum groundwater table in determining the anticipated maximum groundwater table.
(B) Curtain Drains.
A curtain drain or other effective groundwater interceptor may be allowed as an attempt to lower the groundwater table to meet the requirements of this rule. The regulatory authority shall require that the effectiveness of such devices in lowering the groundwater table be demonstrated during the season of maximum groundwater table.
(v) Ground Slope.
Absorption systems may not be placed on slopes where the addition of fluids is judged to create an unstable slope.
(A) Absorption systems may be placed on slopes between 0% and 25%, inclusive.
(B) Absorption systems may be placed on slopes greater than 25% but not exceeding 35% if:
(I) all other requirements of this rule can be met;
(II) effluent from the proposed system will not contaminate groundwater or surface water, and will not surface or move off site before it is adequately treated to protect public health and the environment;
(III) no slope will fail, and there will be no other landslide or structural failure if the system is constructed and operated adequately, even if all properties in the vicinity are developed with onsite wastewater systems; and
(IV) a report is submitted by a professional engineer or professional geologist that is licensed to practice in Utah. The report shall be imprinted with the engineer's or geologist's registration seal and signature and shall include the following:
(IV.a) Predictions and supporting information of groundwater transport from the proposed system and of expected areas of groundwater mounding.
(IV.b) A slope stability analysis that shall include information about the geology of the site and surrounding area, soil exploration and testing, and the effects of adding effluent.
(IV.c) The cumulative effect on slope stability of added effluent if all properties in the vicinity were developed with onsite wastewater systems.
(C) Absorption systems may not be placed on slopes greater than 35%.
(vi) Other Factors Affecting Onsite Wastewater System Feasibility.
(A) The locations of all rivers, streams, creeks, dry or ephemeral washes, lakes, canals, marshes, subsurface drains, natural storm water drains, lagoons, artificial impoundments, either existing or proposed, that will affect building sites, shall be provided.
(B) Areas proposed for onsite wastewater systems shall comply with the setbacks in Section R317-4-13 Table 2.
(C) If any part of a property lies within or abuts a flood plain area, the flood plain shall be shown within a contour line and shall be clearly labeled on the plan with the words "flood plain area".
(vii) Unsuitable.
Where soil and other site conditions are clearly unsuitable for the placement of an onsite wastewater system, there is no need for conducting soil exploration pits or percolation tests.

(c) Lot Size.
One of the following two methods shall be used for determining minimum lot size. Determination of minimum lot size by the regulatory authority may not preempt local governments from establishing larger minimum lot sizes.
(i) Method 1.
The local health department having jurisdiction may determine minimum lot size. Under this method, local health departments may elect to involve other affected governmental entities and the division in making joint lot size determinations. The division will develop technical information, training programs, and provide engineering and geohydrologic assistance in making lot size determinations that will be available to local health departments upon their request. Individuals or developers requesting lot size determinations under this method will be required to submit to the local health department, at their own expense, a report that accurately takes into account at least the following factors:
(A) soil type and depth;
(B) area drainage, lot drainage, and potential for flooding;
(C) protection of surface and groundwaters;
(D) setbacks from property lines, water supplies, etc.;
(E) source of culinary water;
(F) topography, geology, hydrology and ground cover;
(G) availability of public sewers;
(H) activity or land use, present and anticipated;
(I) growth patterns;
(J) individual and accumulated gross effects on water quality;
(K) reserve areas for additional subsurface dispersal;
(L) anticipated wastewater volume;
(M) climatic conditions;
(N) installation plans for wastewater system; and
(O) area to be utilized by dwelling and other structures.
(ii) Method 2.
(A) Whenever local health departments do not establish minimum lot sizes for single-family dwellings that will be served by onsite wastewater systems, the requirements of Section R317-4-13 Tables 1.1 and 1.2 shall be met.
(B) For non-residential facilities, one-half of the buildable area of the lot must be available for the absorption system and replacement area.
(I) The area required for the absorption system and replacement area may be adjusted during the permitting process.
(2) Subdivision Onsite Wastewater System Feasibility Determination.
(a)i In addition to information in Subsection R317-4-4(1), the following information must be provided on a plat map:
(i) the proposed street and lot layout with all lots consecutively numbered;
(ii) size and dimensions of each lot, with the minimum required area sufficient to permit the safe and effective use of an onsite wastewater system, including a replacement area for the absorption system;
(iii) location of all water lines;
(iv) location of any easements; and
(v) areas proposed for wastewater dispersal, including replacement area.
(b) Surface drainage systems shall be included on the plan, as naturally occurring, and as altered by roadways or any drainage, grading or improvement, installed or proposed by the developer. The details of the system shall show the surface drainage structures, whether ditches, pipes, or culverts, will in no way affect onsite wastewater systems on the property.
(c) Each proposed lot shall have at least one soil exploration pit, percolation test, or both.
(i) The regulatory authority may allow fewer tests based on the uniformity of prevailing soil and groundwater characteristics and available percolation or soil log test data.
(ii) If soil conditions and surface topography indicate, a greater number of soil exploration pits or percolation tests may be required by the regulatory authority.
(iii) The location of all soil exploration pits and percolation test holes shall be clearly identified on the subdivision final plat and identified by a key number or letter designation.
(iv) The results of such soil tests, including stratified depths of soils and final percolation rates for each lot shall be recorded on or with the final plat.

(v) Soil exploration pits and percolation tests shall be conducted as closely as possible to the dispersal system sites on the lots or parcels.
(d) Whenever available, information from published soil studies of the area of the proposed subdivision shall be submitted for review.
(e) If soil or site conditions exist in or near the project so as to complicate design and location of an onsite wastewater system, a detailed system layout shall be provided for those lots presenting the greatest design difficulty by meeting rules in Section R317-4-5.
(3) Statement of Feasibility.
After review of all information, plans, and proposals, the regulatory authority shall make a written determination of feasibility stating the results of the review or the need for additional information.
(a) An affirmative statement of feasibility for a subdivision does not imply that it will be possible to install onsite wastewater systems on all of the proposed lots, but shall mean that such onsite wastewater systems may be installed on the majority of the proposed lots in accordance with minimum state requirements and any conditions that may be imposed.
(b) The regulatory authority shall establish the expiration, if any, of the statement of feasibility.

R317-4-5. Plan Review and Permitting.
(1) Plan Review and Permitting.
(a) Designer Certification.
All plans and specifications shall be prepared by an individual certified in accordance with Rule R317-11.
(b) Domestic Wastewater.
Plans and specifications for the construction, alteration, extension, or change of use of any onsite wastewater system that receives domestic wastewater shall be submitted to the regulatory authority.
(c) Non-Domestic Wastewater.
Plans and specifications for the construction, alteration, extension, or change of use of any onsite wastewater system that receives non-domestic wastewater shall be submitted to and approved by the local health department having jurisdiction and the division.
(d) Construction Permit Required.
The regulatory authority shall review said plans and specifications as to their adequacy of design for the intended purpose, and shall, if necessary, require such changes as are required by these rules. When the reviewing regulatory authority is satisfied that plans and specifications are adequate for the conditions under which a system is to be installed and used, a construction permit shall be issued to the individual making the submittal.
(i) Construction may not commence until the construction permit has been issued by the regulatory authority.
(e) Information Required.
Plans submitted for review shall be drawn to scale, 1" = 10', 20' or 30', or other scale as approved by the regulatory authority. Plans shall be prepared in such a manner that the contractor can read and follow them in order to install the system properly. Depending on the individual site and circumstances, or as determined by the regulatory authority, some or all of the following information may be required.
(i) Applicant Information.
(A) The name, current address, and telephone number of the applicant.
(B) Complete address, legal description of the property, or both to be served by this onsite wastewater system.
(ii) Onsite Wastewater System Site Plan.
(A) Submittal date of plan.
(B) North arrow.
(C) Lot size and dimensions.
(D) Legal description of property.
(E) Ground surface contours, preferably at 2 foot intervals, of both the original and proposed final grades of the property, or relative elevations using an established benchmark.
(F) Location and explanation of type of dwelling or structure to be served by an onsite wastewater system.
(I) Maximum number of bedrooms, including statement of whether a finished or unfinished basement will be provided, or if other than a single-family dwelling, the number of occupants expected and the estimated gallons of wastewater generated per day.
(G) Location and dimensions of paved and unpaved driveways, roadways and parking areas.
(H) Location and dimensions of the essential components of the wastewater system including the replacement area for the absorption system.
(I) Location of all soil exploration pits and all percolation test holes.
(J) Location of building sewer and water service line to serve the building.

(K) Location of easements or drainage right-of-ways affecting the property.
(L) Location of all intermittent or year-round streams, ditches, watercourses, ponds, subsurface drains, etc. within 100 feet of proposed onsite wastewater system.
(M) The location, type, and depth of all existing and proposed non-public water supply sources within 200 feet of onsite wastewater systems, and of all existing or proposed public water supply sources within 1500 feet of onsite wastewater systems and associated source protection zones.
(N) Distance to nearest public water main and size of main.
(O) Distance to nearest public sewer, size of sewer, and whether accessible by gravity.
(iii) Statement with Site Plan.
Statement indicating the source of culinary water supply, whether a well, spring, non-public or public system, its location and distances from all onsite wastewater systems within 200 feet.
(iv) Site Assessment and Soil Evaluation.
Soil Logs, Percolation Test Certificates, or both.
(A) Statement with supporting evidence indicating the maximum anticipated groundwater table and the flooding potential for onsite wastewater system sites.
(v) Relative Elevations.
Show relative elevations of the following, using an established benchmark.
(A) Building drain outlet.
(B) The inlet and outlet inverts of any septic tanks.
(C) Septic tank access cover, including height and diameter of riser, if used.
(D) Pump tank inlet, if used, including height and diameter of riser.
(E) The outlet invert of the distribution box, if provided, and the ends or corners of each distribution pipe lateral in the absorption system.
(F) The final ground surface over the absorption system.
(vi) System Design.
Details for said site, plans, and specifications as listed in Section R317-4-6.
(A) Schedule or grade, material, diameter, and minimum slope of building sewer and effluent sewer.
(B) Septic tank and pump tank capacity, design, cross sections, etc., materials, and dimensions. If tank is commercially manufactured, state the name and address of manufacturer.
(C) Absorption system details, including the following:
(I) details of drop boxes or distribution boxes, if provided;
(II) schedule or grade, material, and diameter of distribution pipes;
(III) length, slope, and spacing of each absorption system component;
(IV) maximum slope across ground surface of absorption system area;
(V) distance of absorption system from trees, cut banks, fills, or subsurface drains; and
(VI) cross section of absorption system showing the:
(VI.a) depth and width of absorption system excavation;
(VI.b) depth of distribution pipe;
(VI.c) depth of filter material;
(VI.d) barrier material, i.e. synthetic filter fabric, straw, etc., used to separate filter material from cover; and
(VI.e) depth of cover.
(D) Pump, if provided, shall include details as referenced in Section R317-4-14 Appendix B.
(E) If an alternative system is designed, include all pertinent information to allow plan review and permitting for compliance with this rule.
(F) Plans Submitted.
(I) All applicants requesting plan approval for an onsite wastewater system shall submit a sufficient number of copies of the above required information to enable the regulatory authority to retain one copy as a permanent record.
(II) Applications may be rejected if proper information is not submitted.

R317-4-6. Design Requirements.

(1) System Location.
(a) Onsite wastewater systems are not suitable in some areas and situations. Location and installation of each system shall be such that with reasonable maintenance, it will function in a sanitary manner and will not create a nuisance, public health hazard, or endanger the quality of any waters of the state.
(b) In determining a suitable location for the system, due consideration shall be given to such factors as:
(i) the minimum setbacks in Section R317-4-13 Table 2;

(ii) size and shape of the lot;
(iii) slope of natural and final grade;
(iv) location of existing and future water supplies;
(v) depth of groundwater and bedrock;
(vi) soil characteristics and depth;
(vii) potential flooding or storm catchment;
(viii) possible expansion of the system; and
(ix) future connection to a public sewer system.
(2) Minimum Setback Distances.
All systems, including the replacement area, shall conform to the minimum setback distances in Section R317-4-13 Table 2.
(3) Maximum Ground Slope.
All absorption systems, including the replacement area, shall conform to the ground slope requirements in Section R317-4-4.
(4) Estimates of Wastewater Quantity.
(a) Single Family Dwellings.
A minimum of 300 gallons per day, 1 or 2 bedroom, and 150 gallons per day for each additional bedroom shall be used.
(b) Non-Residential Facilities.
The quantity of wastewater shall be determined accurately, preferably by actual measurement. Metered water supply figures for similar installations can usually be relied upon, providing the non-disposable consumption, if any, is subtracted. Where this data is not available, the minimum design flow figures in Section R317-4-13 Table 3 shall be used to make estimates of flow.
(c) Design Capacity.
In no event shall the anticipated maximum daily wastewater flow exceed the capacity for which a system is designed.
(5) Non-Domestic Effluent.
Effluent shall be treated to levels at or below the defined parameters of non-domestic effluent before being discharged into an absorption system.
(6) Building Sewer.
(a) The building sewer shall have a minimum inside diameter of 4 inches and shall comply with the minimum standards in Section R317-4-13 Table 4.
(i) If the sewer leaving the house is 3 inches, the building sewer may be 3 inches.
(b) Building sewers shall be laid on a uniform minimum slope of not less than 1/4 inch per foot or 2.08% slope.
(c) The building sewer shall have a minimum of one cleanout and cleanouts every 100 feet.
(i) A cleanout is also required for each aggregate horizontal change in direction exceeding 135 degrees.
(ii) Ninety degree ells are not recommended.
(d) Building sewers shall be separated from water service pipes in separate trenches, and by at least 10 feet horizontally, except that they may be placed in the same trench when all of the following conditions are met.
(i) The bottom of the water service pipe, at all points, shall be at least 18 inches above the top of the building sewer.
(ii) The water service pipe shall be placed on a solid shelf excavated at one side of the common trench with a minimum clear horizontal distance of at least 18 inches from the sewer or drain line.
(iii) The number of joints in the water service pipe should be kept to a minimum, and the materials and joints of both the sewer and water service pipes shall be of strength and durability to prevent leakage under adverse conditions.
(iv) If the water service pipe crosses the building sewer, it shall be at least 18 inches above the latter within 10 feet of the crossing. Joints in water service pipes should be located at least 10 feet from such crossings.
(e) Any building sewer placed under a driveway or other areas subjected to heavy loads shall receive special design consideration to ensure against crushing or disruption of alignment.
(7) Septic Tank.
All septic tanks shall meet the requirements of Section R317-4-14 Appendix A and be approved by the division. Septic tanks shall be constructed of sound, durable, watertight materials that are not subject to excessive corrosion, frost damage, or decay. They shall be designed to be watertight, and to withstand all expected physical forces.

(a) Liquid capacity.
(i) A septic tank that serves a non-residential facility shall have a liquid capacity of at least 1-1/2 times the designed daily wastewater flow. In all cases the capacity shall be at least 1,000 gallons.
(ii) The capacity of a septic tank that serves a single family dwelling shall be based on the number of bedrooms that can be anticipated in the dwelling served, including the unfinished space available for conversion as additional bedrooms. Unfinished basements shall be counted as a minimum of one additional bedroom.
(A) The minimum liquid capacity of the tank shall be 1,000 gallons for up to three bedroom homes.
(B) The minimum liquid capacity of the tank shall be 1,250 gallons for four bedroom homes.
(C) Two hundred fifty gallons per bedroom shall be added to the liquid capacity of the tank for each additional bedroom over four bedrooms.
(iii) The regulatory authority may require a larger capacity than specified in this subsection as needed for unique or unusual circumstances.
(b) Tanks in Series.
(i) No tank in the series shall be smaller than 1,000 gallons.
(ii) The capacity of the first tank shall be at least two-thirds of the required total septic tank volume. If compartmented tanks are used, the compartment of the first tank shall have this two-thirds capacity.
(A) A membrane bioreactor system may include the balance tank as a second tank in series where the volume of the balance tank is included in the total required septic tank liquid storage capacity.
(iii) The connecting pipes between each successive tank shall meet the slope requirements of the building sewer and shall be unrestricted except for the inlet to the first tank and the outlet for the last tank.
(c) Maximum Number of Tanks or Compartments.
The maximum number of tanks and compartments in series may not exceed three.
(d) Inlets and Outlets.
Inlet or outlet devices shall conform to the following:
(i) Approved tanks with offset inlets may be used where they are warranted by constraints on septic tank location.
(ii) Multiple outlets from septic tanks shall be prohibited unless preauthorized by the regulatory authority.
(iii) A gas deflector may be added at the outlet of the tank to prevent solids from entering the outlet pipe of the tank.
(e) Effluent Screens.
Any septic tank may have an effluent screen installed at the outlet of the terminal tank. The screen shall prevent the passage of solid particles larger than a nominal 1/8 inch diameter sphere. The screen shall be easily removable for routine servicing by installing a riser to the ground surface, with an approved cover. An effluent screen is required for any non-domestic wastewater system, unless screening is achieved by some other means acceptable to the regulatory authority.
(f) Access to Tank Interior.
Adequate access to the tank shall be provided to facilitate inspection, pumping, servicing, and maintenance, and shall have no structure or other obstruction placed over it and shall conform to all of the following requirements.
(i) Riser Heights.
Watertight risers are required, extending to within 6 inches of the surface of the ground when soil covering the septic tank is greater than 6 inches. Preferably, the riser should be brought up to the final grade to encourage periodic servicing and maintenance.
(A) If a septic tank is located under paving or concrete, risers shall be extended up through the paving or concrete.
(B) If non-domestic wastewater is generated, risers shall be extended to the final grade.
(ii) Riser Diameter.
The inside diameter of the riser shall be a minimum of 20 inches.
(iii) Riser Covers.
Riser covers shall be designed and constructed in such a manner that:
(A) they may not pass through the access openings;
(B) when closed shall be child-proof;
(C) shall prevent entrance of surface water, dirt, or other foreign materials; and
(D) shall seal odorous gasses in the tank.
(iv) Riser Construction.
The risers shall be constructed of durable, structurally sound materials that are approved by the regulatory authority and designed to withstand expected physical loads and corrosive forces.
(v) Multiple Risers Required.
When the tank capacity exceeds 3,000 gallons, a minimum of two access risers shall be installed.
(g) Other Requirements.

Tank installation shall conform to all of the following requirements.
(i) Groundwater.
(A) Septic tanks located in high groundwater areas shall be designed with an appropriate weighted or anti-buoyancy device to prevent flotation in accordance with the manufacturer's recommendations.
(B) The building sewer inlet of the tank may not be installed at an elevation lower than the highest anticipated groundwater elevation.
(I) If the tank serves a mound, packed bed, or membrane bioreactor alternative system and has an electronic control panel capable of detecting water intrusion, the building sewer inlet of the tank may be installed below the maximum anticipated groundwater elevation.
(I.a) Any component below the anticipated maximum groundwater elevation shall be water tightness tested.
(ii) Depth of Septic Tank.
The minimum depth of cover over the septic tank shall be at least 6 inches and a maximum of 48 inches at final grading. For unusual situations, the regulatory authority may allow deeper burial provided the following conditions are met.
(A) The tank shall be approved by the division for the proposed depth and burial cover load.
(B) Risers shall:
(I) be installed over the access openings of the inlet and outlet baffles or sanitary tees; and
(II)shall conform to Subsection R317-4-6(7)(f), except risers shall be at least 24 inches in diameter.
(8) Grease Interceptor Tanks.
A grease interceptor tank or automatic grease removal device may be required by the regulatory authority to receive the drainage from fixtures and equipment with grease-laden waste. It shall be sized according to the current Plumbing Code.
(a) Accessibility and Installation.
Tanks installed in the ground shall conform to Subsection R317-4-6(7)(f) for accessibility and installation, except risers are required and shall be brought to the surface of the ground. All interior compartments shall be accessible for inspecting, servicing, and pumping.
(9) Pump and Recirculation Tanks.
(a) Tanks shall be constructed of sound, durable, watertight materials that are not subject to excessive corrosion, frost damage, or decay. They shall be designed to be watertight, and to withstand all expected physical forces.
(b) Pump tank volume shall have a liquid capacity adequate for the minimum operating volume that includes the dead space, dosing volume, and surge capacity, and shall have the emergency operation capacity of:
(i) storage capacity for the system design daily wastewater flow;
(ii) at least two independent power sources with appropriate wiring installed; or
(iii) other design considerations approved by the regulatory authority that do not increase public health risks in the event of pump failure.
(c) Accessibility and Installation.
Tanks shall conform to Subsection R317-4-6(7)(f) for accessibility and installation, except risers are required and shall be brought to the surface of the ground. All interior compartments shall be accessible for inspecting, servicing, and pumping.
(d) The outlet of any septic tank upstream of any pump tank shall be fitted with an effluent screen, unless a pump vault is used in the pump tank.
(10) Pump Vaults.
Pump vaults may be used when approved by the regulatory authority.
(a) The vault shall be constructed of durable material and resistant to corrosion.
(b) The vault shall have an easily accessible screen with 1/8 inch openings or smaller.
(c) All components of the vault shall be accessible from the surface.
(d) When a pump vault is used in a septic tank:
(i) The tank size shall be increased by the larger of the following:
(A) two hundred fifty gallons; or
(B) ten percent of the required capacity of the tank.
(ii) At least two independent power sources with appropriate wiring, or other design considerations approved by the regulatory authority that do not increase public health risks, shall be installed.
(iii) The maximum drawdown within the tank shall be no more than 3 inches per dose.
(11) Pumps.
See Section R317-4-14 Appendix B for details.
(12) Sampling Ports.

When a system is required to have effluent sampling or receives non-domestic wastewater, the system shall include a sampling port at an area approved by the regulatory authority capable of sampling effluent prior to the absorption system.
(13) Effluent Sewer.
(a) The effluent sewer shall have a minimum inside diameter of 4 inches and shall comply with the minimum standards in Section R317-4-13 Table 4.
(b) The effluent sewer shall extend at least 5 feet beyond the septic tank before entering the absorption system.
(c) Any effluent sewer shall be laid on a uniform minimum slope of not less than 1/4 inch per foot or 2.08% slope. When it is impractical, due to structural features or the arrangement of any building, to obtain a slope of 1/4 inch per foot, a sewer pipe of 4 inches in diameter or larger may have a slope of not less than 1/8 inch per foot or 1.04% slope when approved by the regulatory authority.
(d) Any effluent sewer line shall have cleanouts at least every 100 feet.
(e) Any effluent sewer placed under driveways or other areas subjected to heavy loads shall receive special design considerations to ensure against crushing or disruption of alignment.
(14) Absorption Systems.
(a) System Types.
(i) Absorption Trenches.
(A) Standard Trenches.
(B) Chambered Trenches.
(C) Bundled Synthetic Aggregate Trenches.
(ii) Absorption Beds.
(iii) Deep Wall Trenches.
(iv) Seepage Pits.
(b) General Requirements.
(i) Replacement Area for Absorption Systems.
Adequate and suitable land shall be reserved and kept free of permanent structures, traffic, or adverse soil modification for 100% replacement of each absorption system. If approved by the regulatory authority, the area between standard trenches or deep wall trenches may be regarded as replacement area.
(A) In lieu of a replacement area, two complete absorption systems shall be installed with a diversion valve. The valve shall be accessible from the final grade. The valve should be switched at least annually.
(ii) Protection of Absorption Systems.
The site of the initial and replacement absorption system may not be covered by asphalt, concrete, or structures, or be subject to vehicular traffic, or other activity that would adversely affect the soil, such as construction material storage, soils storage, etc. This protection applies before and after construction of the onsite wastewater system.
(iii) Sizing Criteria for Absorption Systems.
Absorption systems shall be sized based on Section R317-4-13 Table 5 or 6.
(iv) Design Criteria for Absorption Systems.
Many different designs may be used in laying out absorption systems, the choice depending on the size and shape of the available areas, the capacity required, and the topography of the dispersal area.
(A) Horizontal Setbacks.
Absorption systems shall comply with the setbacks in Section R317-4-13 Table 2.
(B) Sloping Ground.
Absorption systems placed in 10% or greater sloping ground shall be designed so that there is a minimum of 10 feet of undisturbed earth measured horizontally from the bottom of the distribution line to the ground surface. This requirement does not apply to drip irrigation.
(C) Undisturbed Natural Earth.
That portion of absorption systems below the top of distribution pipes shall be in undisturbed natural earth.
(D) Tolerance.
All piping, chambers, and the bottoms of absorption system excavations shall be designed level.
(E) Distribution Pipe.
Distribution pipe for gravity-flow absorption systems shall be 4 inches in diameter and shall comply with the minimum standards in Section R317-4-13 Table 4.
(I) The pipe shall be penetrated by at least two rows of round holes, each 1/2 inch in diameter, and located at approximately 6 inch intervals. The perforations should be located at about the five o'clock and seven o'clock positions on the pipe.
(II) The open ends of the pipes shall be capped.

(F) Absorption System Laterals.
Absorption system laterals should be designed to receive proportional flows of wastewater.
(G) Drain Media Protection.
Drain media shall be covered with a barrier material before being covered with earth backfill.
(H) Prohibitions.
(I) In gravity-flow absorption systems with multiple distribution lines, the effluent sewer may not be in direct line with any one of the distribution pipes, except where drop boxes or distribution boxes are used.
(II) Any section of distribution pipe laid with non-perforated pipe may not be considered in determining the required absorption area.
(III) Perforated distribution pipe may not be placed under driveways or other areas subjected to heavy loads.
(I) Exceptions.
Deep wall trenches and filled seepage pits may be allowed beneath unpaved driveways on a case-by-case basis by the regulatory authority, if the top of the distribution pipe is at least 3 feet below the final ground surface.
(c) Effluent Distribution Devices.
(i) Distribution Boxes.
Distribution boxes may be used on level or nearly level ground. They shall be watertight and constructed of durable, corrosion resistant material. They shall be designed to accommodate the inlet pipe and the necessary distribution lines.
(A) The outlet inverts of the distribution box may not be less than 1 inch below the inlet invert.
(B) Distribution boxes shall have risers brought to final grade.
(ii) Drop Boxes.
Drop boxes shall be watertight and constructed of durable, corrosion resistant material and may be used to distribute effluent within the absorption system and shall meet the following requirements:
(A) Drop boxes shall be designed to accommodate the inlet pipe, an outlet pipe leading to the next drop box, except for the last drop box, and one or two distribution pipes leading to the absorption system.
(B) The inlet pipe to the drop box shall be at least 1 inch higher than the outlet pipe leading to the next drop box.
(C) The invert of the distribution pipes shall be 1 through 6 inches below the outlet invert. If there is more than one distribution pipe, their inverts shall be at exactly the same elevation.
(D) Drop boxes shall have risers brought to final grade.
(iii) Effluent Pump to Absorption System.
(A) If a pump is used to lift effluent to an absorption system, the pump tank or pump vault shall meet the requirements of Subsection R317-4-6(9) or R317-4-6(10) and the pump and controls shall meet the requirements of Section R317-4-14 Appendix B.
(B) Pumping to any absorption system may not warrant any reduction to the absorption area.
(iv) Other Devices.
Tees, wyes, ells, or other distributing devices may be used as needed to permit proportional flow to the branches of the absorption system. A clean out or other means of access from the surface shall be provided for these devices.
(d) Effluent Distribution Methods.
(i) Closed Loop.
In locations where the slope of the ground over the absorption system area is relatively flat, the trenches should be interconnected to produce a closed loop system and the trenches shall be installed at the same elevations.
(ii) Non-Closed Loop.
If a non-closed loop design is used, effluent shall be proportionally distributed to each lateral.
(iii) Serial or Sequential.
Serial or sequential distribution may be used in absorption systems designed for sloping areas, or where absorption system elevations are not equal.
(A) Serial trenches shall be connected with a drop box or watertight overflow line in such a manner that a trench will be filled before the effluent flows to the next lower trench.
(B) The overflow line shall be a 4-inch solid pipe with direct connections to the distribution pipes. It should be laid in a trench excavated to the exact depth required. Care must be exercised to ensure a block of undisturbed earth remains between trenches. Backfill should be carefully tamped.
(iv) Pressure Distribution.
(A) General Requirements.
(I) Conformance to Applicable Requirements.
All requirements stated elsewhere in this rule for design, setbacks, construction and installation details, performance, repairs, and abandonment shall apply.

(II) Design Criteria.
All systems that use this method shall be designed by a person certified at Level 3 in accordance with Rule R317-11.
(II.a) The designer shall submit details of all system components with the necessary calculations.
(II.b) The designer shall provide to the local health department and to the owner operation and maintenance instructions that include the minimum inspection levels in Section R317-4-13 Table 7 for the system.
(II.c) Record in the Chain of Title.
When a system utilizing pressure distribution exists on a property, notice of the existence of that system shall be recorded in the chain of title for that property.
(B) Design.
(I) Pressure distribution may be permitted on any site meeting the requirements for an onsite wastewater system if conditions in this rule can be met.
(II) Pressure distribution should be considered when:
(II.a) effluent pumps are used;
(II.b) the flow from the dwelling or structure exceeds 3,000 gallons per day;
(II.c) soils are a Type 1 or have a percolation rate faster than five minutes per inch; or
(II.d) soils are a Type 5 or have a percolation rate slower than 60 minutes per inch.
(III) The Utah Guidance for Performance, Application, Design, Operation and Maintenance: Pressure Distribution Systems document shall be used for design requirements, along with the following:
(III.a) Dosing pumps, controls and alarms shall comply with Section R317-4-14 Appendix B.
(III.b) Pressure distribution piping.
(III.b.1) All pressure transport, manifold, lateral piping, and fittings shall meet PVC Schedule 40 standards or equivalent.
(III.b.2) The ends of lateral piping shall be constructed with sweep elbows or an equivalent method to bring the end of the pipe to final grade. The ends of the pipe shall be provided with threaded plugs, caps, or other devices acceptable to the regulatory authority to allow for access and flushing of the lateral.
(e) Design of Absorption Systems.
(i) Any absorption system shall be designed to approximately follow the ground surface contours so that variation in excavation depth will be minimized. The excavations may be installed at different elevations, but the bottom of each individual excavation shall be level throughout its length.
(ii) Absorption systems should be constructed as shallow as is possible to promote treatment and evapotranspiration.
(iii) Observation ports may be placed to observe the infiltrative surfaces of the trenches or beds.
(iv) Absorption Trenches.
(A) Absorption trenches shall conform to the following:
(I) The minimum required effective absorption area shall be calculated using Section R317-4-13 Table 5 or Table 6.
(II) The effective absorption area of absorption trenches shall be calculated as the total bottom area of the excavated trench system in square feet.
(III) Minimum number of absorption trenches: 2.
(IV) Maximum length of absorption trenches, not including connecting trenches: 150 feet.
(V) Minimum spacing of absorption trenches from wall to wall: 7 feet.
(VI) Minimum width of absorption trench excavations: 24 inches.
(VII) Maximum width of absorption trench excavations: 36 inches.
(VIII) Minimum depth of absorption trench excavations below original, natural grade: 10 inches.
(IX) Minimum depth of soil cover over the absorption trenches: 6 inches.
(X) Minimum separation from the bottom of the absorption trenches to:
(XI) the anticipated maximum groundwater table: 24 inches; and
(XII) unsuitable soil or bedrock formations: 48 inches.
(B) Standard Trenches.
Standard trenches shall conform to the following:
(I) Top of distribution pipe may not be installed above original, natural grade.
(II) The distribution pipe shall be centered in the absorption trench and placed the entire length of the trench.
(III) Drain media shall extend the full width and length of the trenches to a depth of at least: 12 inches.
(IV) Minimum depth of drain media under the distribution pipe: 6 inches.
(V) Minimum depth of drain media over the distribution pipe: 2 inches.
(VI) Minimum depth of cover over the barrier material: 6 inches.

(C) Chambered Trenches.
Chambered trenches shall conform to the following:
(I) All chambers shall meet International Association of Plumbing and Mechanical Officials (IAPMO) Standard PS 63-2005, which is hereby incorporated into this rule by reference.
(II) The minimum required effective absorption area of chambered trenches shall be calculated:
(II.a) for Type A Chambers as: 36 inches; and
(II.b) for Type B Chambers as: 24 inches;
(II.c) using Section R317-4-13 Table 5 or 6 and may be reduced by: 30%.
(III) The chambered trenches shall be designed and installed in conformance with manufacturer recommendations, as modified by these rules.
(IV) Type A Chambers.
(IV.a) Minimum width of chambers: 30 inches.
(IV.b) Maximum width of trench excavations: 36 inches.
(V) Type B Chambers.
(V.a) Minimum width of chambers: 22 inches.
(V.b) Maximum width of trench excavations: 24 inches.
(VI) Minimum elevation of the inlet pipe invert from the bottom of the chamber: 6 inches.
(VII) All chambers shall have a splash plate under the inlet pipe or another design feature to avoid unnecessary channeling into the trench bottom.
(VIII) Inlet and outlet effluent sewer pipes shall enter and exit the chamber endplates.
(IX) Minimum depth of cover over the chambers: 12 inches.
The depth of cover may be reduced to no less than 6 inches, if approved by the regulatory authority, considering the protection of absorption systems as required in Subsection R317-4-6(14)(b)(ii), and other activities, as determined by the authority.
(D) Bundled Synthetic Aggregate Trenches.
Bundled synthetic aggregate trenches shall conform to the following.
(I) All synthetic aggregate bundles shall meet IAPMO Standards for the General, Testing and Marking and Identification of the guide criteria for Bundled Expanded Polystyrene Synthetic Aggregate Units.
(II) The effective absorption area of bundled synthetic aggregate trenches shall be calculated as the total bundle length times the total bundle width in square feet.
(III) The bundled synthetic aggregate trenches shall be designed and installed in conformance with manufacturer recommendations, as modified by these rules.
(IV) Only 12-inch diameter bundles are approved in this rule.
(IV.a) For bundles with perforated pipe the minimum depth of synthetic aggregate under pipe: 6 inches.
(V) Width of trenches.
(V.a) When designed for a 3 foot wide trench, three bundles are laid parallel to each other with the middle bundle containing perforated pipe.
(V.b) When designed for a 2 foot wide trench, two bundles are placed on the bottom, with one bundle containing perforated pipe.
(VI) Minimum depth of cover over the bundles: 12 inches.
The depth of cover may be reduced to no less than 6 inches, if approved by the regulatory authority, considering the protection of absorption systems as required in Subsection R317-4-6(14)(b)(ii), and other activities, as determined by the authority.
(ii) Absorption Beds.
Absorption beds shall conform to the requirements applicable to absorption trenches, except for the following.
(A) The minimum required effective absorption area shall be calculated using Section R317-4-13 Table 5 or 6.
(B) The effective absorption area of an absorption bed shall be considered as the total bottom area of the excavated bed system in square feet.
(C) An absorption bed may be built over naturally existing soil types per Section R317-4-13 Table 5 or 6.
(D) The bottom of the entire absorption bed shall be level.
(E) The distribution pipes or chambers shall be interconnected to produce a closed loop distribution system.
(F) Minimum number of laterals in an absorption bed: 2.
(G) Maximum length of laterals in an absorption bed: 150 feet.
(H) Maximum distance between laterals: 6 feet.
(I) Minimum distance between laterals and sidewalls: 1 foot.
(J) Maximum distance between laterals and sidewalls: 3 feet.
(K) Minimum distance between absorption beds: 7 feet.

(L) Minimum depth of an absorption bed excavation from original, natural grade: 10 inches.
(M) Absorption beds with drain media:
(I) Minimum depth of drain media under distribution pipe: 6 inches.
(II) Minimum depth of drain media over distribution pipe: 2 inches.
(III) Minimum depth of cover over the barrier material: 6 inches.
(N) Absorption beds with chambers:
(I) Chambers shall be installed with sides touching, no separation allowed.
(II) All chambers shall be connected in a closed loop distribution system.
(III) The outlet side of the chamber runs shall be connected through the bottom port of the end plates.
(IV) No absorption area reduction factor shall be given for using chambers in absorption beds.
(V) Minimum depth of cover over the chambers: 12 inches.
(iii) Deep Wall Trenches.
Deep wall trenches shall conform to the following:
(A) The minimum required effective absorption area shall be calculated using Section R317-4-13 Table 5 or 6.
(B) The effective absorption area of deep wall trenches shall be calculated using the total trench vertical sidewall area below the distribution pipe. The bottom area and any highly restrictive or impervious strata or bedrock formations may not be considered in determining the effective sidewall absorption area.
(C) If percolation tests are used, they shall be conducted in accordance with Section R317-4-14 Appendix D and in the most restrictive soil horizon.
(D) Maximum length of trenches: 150 feet.
(I) Maximum length of trenches does not include connecting trenches.
(E) Minimum spacing of trenches from wall to wall: 12 feet,
or three times the depth of the media under the distribution pipe, whichever is the larger distance.
(F) Vertical depth of trenches.
(I) Minimum effective sidewalls: 2 feet.
(II) Maximum effective sidewalls: 10 feet.
(III) Calculate using only suitable soil formation.
(G) Minimum width of trench excavations: 24 inches.
(H) Minimum separation from the bottom of deep wall trench to:
(I) the anticipated maximum groundwater table: 48 inches;
(II) unsuitable soil or bedrock formations: 48 inches.
(I) Drain media shall cover the coarse drain media to permit leveling of the distribution pipe and shall extend the full width and length of the trenches.
(I) Minimum depth of drain media: 12 inches.
(II) Minimum depth of drain media under the distribution pipe: 6 inches.
(III) Minimum depth of drain media over the distribution pipe: 2 inches.
(J) Minimum depth of cover over the barrier material: 6 inches.
(K) The distribution pipe shall be centered in the trench and placed the entire length of the trench.
(L) Setback to property lines: 10 feet.
(iv) Seepage Pits.
Any Seepage pit shall be considered as a modified deep wall trench and shall conform to the requirements applicable to deep wall trenches, except for the following:
(A) The effective absorption area of a seepage pit shall be calculated using the total pit vertical sidewall area below the distribution pipe. The bottom area and any highly restrictive or impervious strata or bedrock formations may not be considered in determining the effective sidewall absorption area.
(B) Minimum diameter of pits: 3 feet.
(C) Vertical depth of pits.
(I) Minimum effective sidewalls: 4 feet.
(II) Maximum effective sidewalls: 10 feet.
(III) Calculate using only suitable soil formation.
(D) Filled Seepage Pits.
(I) In a pit filled with coarse drain media, the perforated distribution pipe shall run across each pit. A layer of drain media shall be used for leveling the distribution pipe.
(II) The entire pit shall be completely filled with coarse drain media to at least the top of any permeable soil formation to be calculated as effective sidewall absorption area.
(E) Hollow-Lined Seepage Pits.
(I) For hollow-lined pits, the inlet pipe shall extend horizontally at least 1 foot into the pit.

(II) The annular space between the lining and excavation wall shall be filled with crushed rock or gravel ranging from 3/4 through 6 inches in diameter and free of fines, sand, clay or organic material. The maximum fines in the gravel shall be 2% by weight passing through a US Standard #10 mesh or 2.0 millimeter sieve.
(III) Minimum width of annular space between lining and sidewall: 12 inches.
(IV) Minimum thickness of reinforced perforated concrete liner: 2-1/2 inches.
(V) Minimum thickness of reinforced concrete top: 6 inches.
(VI) Minimum depth of drain media in pit bottom: 6 inches.
(VII) Minimum depth of cover over seepage pit top: 6 inches.
(VIII) A reinforced concrete top shall be provided.
(VIII.a) When the cover over the seepage pit top exceeds 6 inches, risers shall conform to Subsection R317-4-6(7)(f) for accessibility.
(15) Alternative Systems.
(a) System Types.
(i) At-Grade.
(ii) Mounds.
(iii) Packed Bed Media.
(A) Intermittent Sand Filters.
(B) Recirculating Sand Filters.
(C) Recirculating Gravel Filters.
(D) Textile Filters.
(E) Peat Filters.
(iv) Sand Lined Trenches.
(v) Membrane Bioreactors
(b) General Requirements.
(i) Conformance to Applicable Requirements.
All requirements stated elsewhere in this rule for design, setbacks, construction and installation details, performance, repairs and abandonment shall apply unless stated differently for a given alternative system.
(ii) Sizing Criteria for Alternative Systems.
Absorption area shall be sized based on Section R317-4-13 Table 5 or 6 except as specified in this section.
(iii) Design Criteria for Alternative Systems.
All alternative systems shall be designed by a person certified at Level 3 in accordance with Rule R317-11.
(A) The designer shall submit details of all system components with the necessary calculations.
(B) The designer shall provide to the local health department and to the owner operation and maintenance instructions that include the minimum inspection levels in Section R317-4-13 Table 7 for the system.
(iv) Record in the Chain of Title.
When an alternative system exists on a property, notice of the existence of that system shall be recorded in the chain of title for that property.
(c) Design of Alternative Systems.
(i) At-Grade Systems.
Absorption trenches and absorption beds may be used in at-grade systems. Any at-grade system shall conform to the requirements applicable to absorption trenches and absorption beds, except for the following:
(A) Horizontal setbacks in Section R317-4-13 Table 2 are measured from edge of trench sidewall, except at property lines, where the toe of the final cover shall be 5 feet or greater in separation distance to a property line.
(B) Minimum number of observation ports provided within absorption area: 2.
(I) Any port shall be installed to the depth of the trench or bed.
(C) Depth of absorption excavations below natural grade: 0-10 inches.
(D) Minimum cover over the absorption area: 6 inches.
(E) Maximum slope of natural ground surface: 4%.
(F) The maximum side slope for above ground fill shall be four horizontal to one vertical: 25% slope.
(G) Where final contours are above the natural ground surface, the cover shall extend from the center of the wastewater system at the same general top elevation for a minimum of 10 feet in all directions beyond the limits of the absorption area perimeter, before beginning the side slope.
(ii) Mound Systems.
Mound systems shall conform to the following:
(A) The design shall generally be based on the Wisconsin Mound Soil Absorption System: Siting, Design and Construction Manual, January 2000 published by the University of Wisconsin-Madison Small-Scale Waste Management Project, with the following exceptions.

(I) The minimum separation distance between the natural ground surface and the anticipated maximum groundwater table: 12 inches.
(II) A mound system may be built over naturally existing soil types per Section R317-4-13 Table 5 or 6 provided the minimum depth of suitable soil is:
(II.a) between the natural ground surface and bedrock formations or unsuitable soils: 36 inches; or
(II.b) above soils that have a percolation rate faster than one minute per inch: 24 inches.
(III) The minimum depth of sand media over natural soil: 12 inches.
(IV) The maximum slope of natural ground surface: 25 %.
(V) The separation distances in Section R317-4-13 Table 2 are measured from the toe of the final cover.
(VI) The effluent loading rate at the sand media to natural soil interface shall be calculated using Section R317-4-13 Table 5 or 6.
(VII) The effluent entering a mound system shall be at levels at or below the defined parameters of non-domestic effluent.
(VIII) The minimum thickness of aggregate media around the distribution pipes of the absorption system shall be the sum of 6 inches below the distribution pipe, the diameter of the distribution pipe and 2 inches above the distribution pipe or 10 inches, whichever is larger.
(IX) The cover may not be less than 6 inches in thickness, and shall provide protection against erosion, frost, storm water infiltration and support vegetative growth and aeration of distribution cell.
(X) A minimum of three observation ports shall be located within the mound at each end and the center of the distribution cell.
(X.a) At least one port shall be installed at the gravel-sand interface, and one port at the sand-soil interface.
(B) Mounds shall use pressure distribution.
(I) The Utah Guidance for Performance, Application, Design, Operation and Maintenance: Pressure Distribution Systems document and Subsection R317-4-6(14)(d)(iv) shall be used for design requirements.
(I.a) See Section R317-4-14 Appendix B for pump and control requirements.
(iii) Packed Bed Media Systems.
Packed bed media systems shall conform to the following:
(A) System Design Criteria.
(I) Wastewater Design Flows.
(I.a) For single-family dwellings the design shall be based on a minimum of 300 gallons per day for two bedrooms and 100 gallons per day for each additional bedroom.
(I.b) All other flow estimates shall be based on Subsection R317-4-6(4)
(I.c) Special design considerations shall be given for non-domestic effluent.
(II) Effluent Distribution.
Effluent shall be uniformly distributed over the filter media using pressure distribution.
(B) Absorption System Requirements.
Absorption systems shall conform to the following:
(I) Siting Conditions.
Any packed bed media absorption system may be sited under the following conditions:
(I.a) The minimum separation distance between the natural ground surface and the anticipated maximum groundwater table: 12 inches.
(I.b) Any packed bed media absorption system may be built over naturally existing soil types per Section R317-4-13 Table 5 or 6 provided the minimum depth of suitable soils:
(I.b.1) above soils that have a percolation rate faster than one minute per inch: 24 inches; and
(I.b.2) between the natural ground surface and bedrock formations or unsuitable soils: 36 inches; or
(I.b.3) between the natural ground surface and bedrock formations or unsuitable soils: 18 inches based on an evaluation of infiltration rate and hydrogeology from a professional geologist or engineer that is certified at the appropriate level to perform onsite wastewater system design and having sufficient experience in geotechnical engineering based on:
(I.b.3.A) type, extent of fractures, presence of bedding planes, angle of dip;
(I.b.3.B) hydrogeology of surrounding area; and
(I.b.3.C) cumulative effect of all existing and future systems within the area for any localized mounding or surfacing that may create a public health hazard or nuisance, description of methods used to determine infiltration rate and evaluations of surfacing or mounding conditions.
(I.c) A non-chemical disinfection unit, capable of meeting laboratory testing parameters in Table 7.3, and a maintenance schedule consistent to Section R317-4-13 Tables 7.1 and 7.3, shall be used in excessively permeable soils.

(I.d) Conformance with the minimum setback distances in Section R317-4-13 Table 2, except for the following that require a minimum of 50 feet of separation:
(I.d.1) watercourses, lakes, ponds, reservoirs;
(I.d.2) non-culinary springs or wells;
(I.d.3) foundation drains, curtain drains; or
(I.d.4) non-public culinary grouted wells, constructed as required by Title R309.
(II) Sizing Criteria.
The minimum required effective absorption area shall be calculated using Section R317-4-13 Table 5 or 6 and may be reduced by: 30%.
(II.a) The use of chambered trenches with a packed bed media system may not receive additional reductions as allowed in Subsection R317-4-6(14)(e)(iv)(C)
(III) Separation from Groundwater Table.
The bottom of the absorption system shall have a vertical separation distance of at least 12 inches from the anticipated maximum groundwater table.
(IV) Observation Ports.
A minimum of two observation ports shall be provided within the absorption area.
(V) Drip Irrigation.
Drip irrigation absorption may be used for packed bed media absorption system effluent dispersal based on type of soil and drip irrigation manufacturer's recommendations.
(V.a) Materials shall be specifically designed and manufactured for onsite wastewater applications.
(V.b) Non-absorption components shall be installed per Section R317-4-6 and Section R317-4-13 Table 2.
(C) Intermittent Sand Filter Systems.
(I) Media.
Either sand media or sand fill as described below may be used.
(I.a) Minimum depth of sand media: 24 inches.
(I.b) Minimum depth of sand fill: 24 inches.
(I.b.1) Effective size: 0.35-0.5 millimeter.
(I.b.2) Uniformity coefficient: less than 4.0.
I.b.3) Maximum fines passing through #200 sieve: 1%.
(II) Maximum application rate per day per square foot of media surface area:
(II.a) Sand media: 1.0 gallons.
(II.b) Sand fill: 1.2 gallons.
(III) Maximum dose volume through any given orifice for each dosing: 2 gallons.
(IV) Effluent entering an intermittent sand filter shall be at levels at or below the defined parameters of non-domestic effluent.
(D) Recirculating Sand Filter (RSF) Systems.
(I) Media.
(I.a) Minimum depth of washed sand: 24 inches.
(I.b) Effective size: 1.5-2.5 millimeter.
(I.c) Uniformity coefficient: less than 3.0.
(I.d) Maximum fines passing through #50 sieve: 1%.
(II) Maximum application rate per day per square foot of media surface area: 5 gallons.
(E) Recirculating Gravel Filter (RGF) Systems.
(I) Media.
(I.a) Minimum depth of washed gravel: 36 inches.
(I.b) Effective size: 2.5-5.0 millimeter.
(I.c) Uniformity Coefficient: less than 2.0.
(I.d) Maximum fines passing through #16 sieve: 1%.
(II) Maximum application rate per day per square foot of media surface area: 15 gallons.
(F) Textile Filter Systems.
(I) Media shall be an approved geotextile fabric..
(II) Maximum application rate per day per square foot of media surface area: 30 gallons.
(G) Peat Filter Systems.
(I) Minimum depth of peat media: 24 inches.
(II) Maximum application rate per day per square foot of media surface area: 5 gallons.
(iv) Sand Lined Trench Systems.
Any sand lined trench system shall conform to the following:

(A) Siting Conditions.
(I) The minimum depth of suitable soil or saprolite between the sand media in trenches and the anticipated maximum groundwater table: 12 inches.
(II) Sand lined trench systems may be built over naturally existing:
(II.a) soil types 1 through 4; or
(II.b) soils or saprolite with a percolation rate between 1 and 60 minutes per inch.
(III) The minimum depth of suitable soil or saprolite is:
(III.a) between the sand media in trenches and bedrock formations or unsuitable soils: 36 inches; or
(III.b) above soils or saprolite that have a percolation rate faster than one minute per inch: 24 inches.
(B) Trench Requirements.
Any sand lined trench shall conform to the requirements applicable to absorption trenches except for the following:
(I) Trenches in Suitable Soil.
The minimum required effective absorption area shall be calculated using Section R317-4-13 Table 5 or 6.
(II) Trenches in Saprolite.
The minimum required effective absorption area shall be based on percolation rate using Section R317-4-13 Table 5.
(II.a) This rate shall be determined by conducting percolation tests. The soil shall be allowed to swell not less than 24 hours or more than 30 hours.
(III) The use of chambered trenches with a sand media system may not receive additional reductions as allowed in Subsection R317-4-6(14)(e)(iv)(C).
(IV) Width of absorption trench excavations: 36 inches.
(V) The entire trench sidewall shall be installed in natural ground. At-Grade system designs are not allowed.
(VI) Minimum depth of sand media: 24 inches.
(VII) Sand lined trenches with drain media.
(VII.a) Minimum depth of drain media under the pressure lateral distribution pipe: 6 inches.
(VII.b) Minimum depth of drain media over pressure lateral distribution pipe: 2 inches.
(VII.c) Minimum depth of soil cover or saprolite over drain media: 6 inches.
(VIII) Sand lined trenches with Type A chambers.
(VIII.a) Minimum depth of soil cover or saprolite over chambers: 12 inches.
(IX) Minimum number of observation ports per trench: 1.
(C) Effluent Distribution.
Effluent shall be uniformly distributed over the sand media using pressure distribution.
(I) Design shall generally be based on the Utah Guidance for Performance, Application, Design, Operation and Maintenance: Pressure Distribution Systems document.
(v) Membrane Bioreactor Systems.
Any membrane bioreactor system installed as part of an alternative onsite wastewater system is intended to be installed as a complete unit. The design of any accessory components shall conform to manufacturer specifications specific to the daily flows and wastewater strength proposed to be treated. Membrane bioreactor systems shall conform to the following:
(A) Membrane Bioreactor System Design Criteria.
(I) Wastewater Design Flows.
(I.a) For single-family dwellings the design shall be based on a minimum of 300 gallons per day for two bedrooms and 100 gallons per day for each additional bedroom.
(I.b) All other flow estimates shall be based on Subsection R317-4-6(4).
(I.c) Special design considerations shall be given for non-domestic effluent.
(II) Membrane Bioreactor Design. (II.a) Any membrane bioreactor system installed shall meet the requirements listed in Subsection R317-4-6(7).
(II.a.1) Any septic, equalization, recirculation, pump, or other tank(s) used in conjunction with any membrane bioreactor system shall meet the requirements listed in Section R317-4-6;
(II.a.1.A) MBR tank volume shall have a liquid capacity adequate for the minimum operating volume that includes the dead space, dosing volume, and surge capacity, and shall have the emergency operation capacity of:
(II.a.1.A.i) storage capacity for the system design daily wastewater flow;
(II.a.1.A.ii) at least two independent power sources with appropriate wiring installed; or
(II.a.1.A.iii) other design considerations approved by the regulatory authority that do not increase public health risks in the event of pump failure.

(III) Any membrane bioreactor shall have a minimum of two membrane filter units installed in a manner that any unit can be maintained independently of other filter membrane units.
(IV) Any membrane bioreactor overflow shall discharge directly to the septic tank.
(V) Any membrane bioreactor unit(s) shall be installed according to manufacturer's specifications.
(V.a) Any membrane bioreactor system constructed above ground shall be housed in an easily accessible service building that is climate controlled. The service building shall meet the appropriate permitting and setback distances required by the building authority.
(B) Absorption System Requirements.
(I) Absorption systems shall conform to the following:
(I.a). Siting Conditions.
MBR absorption systems may be sited under the following conditions:
(I.a.1) The minimum separation distance between the natural ground surface and the anticipated maximum groundwater table: 12 inches.
(I.a.2) MBR absorption systems may be built over naturally existing soil types per Section R317-4-13 Table 5 or 6 provided the minimum depth of suitable soils:
(I.a.2.A) above soils that have a percolation rate faster than one minute per inch: 24 inches; and
(I.a.2.B) between the natural ground surface and bedrock formations or unsuitable soils: 36 inches; or
(I.a.2.C) between the natural ground surface and bedrock formations or unsuitable soils: 18 inches based on an evaluation of infiltration rate and hydrogeology from a professional geologist or engineer that is certified at the appropriate level to perform onsite wastewater system design and having sufficient experience in geotechnical engineering based on:
(I.a.2.C.i) type, extent of fractures, presence of bedding planes, angle of dip;
(I.a.2.C.ii) hydrogeology of surrounding area; and
(I.a.2.C.iii) cumulative effect of all existing and future systems within the area for any localized mounding or surfacing that may create a public health hazard or nuisance, description of methods used to determine infiltration rate and evaluations of surfacing or mounding conditions.
(I.a.3) A non-chemical disinfection unit, capable of meeting laboratory testing parameters in Table 7.3, and a maintenance schedule consistent to Section R317-4-13 Tables 7.1 and 7.3, shall be used in excessively permeable soils.
(I.a.4) Conformance with the minimum setback distances in Section R317-4-13 Table 2, except for the following that require a minimum of 50 feet of separation:
(I.a.4.A) watercourses, lakes, ponds, reservoirs;
(I.a.4.B) non-culinary springs or wells;
(I.a.4.C) foundation drains, curtain drains; or
(I.a.4.D) non-public culinary grouted wells, constructed as required by Title R309.
(I.b) Sizing Criteria.
The minimum required effective absorption area shall be calculated using Section R317-4-13 Table 5 or 6 and may be reduced by: 30%.
(I.b.1) The use of chambered trenches with any membrane bioreactor system may not receive additional reductions as allowed in Subsection R317-4-6(14)(e)(iv)(C).
(I.c) Separation from Groundwater Table.
The bottom of the absorption system shall have a vertical separation distance of at least 12 inches from the anticipated maximum groundwater table.
(I.d) Observation Ports.
A minimum of two observation ports shall be provided within the absorption area.
(I.e) Drip Irrigation.
Drip irrigation absorption may be used for membrane bioreactor absorption system effluent dispersal based on type of soil and drip irrigation manufacturer's recommendations.
(I.e.1) Materials shall be specifically designed and manufactured for onsite wastewater applications.
(I.e.2) Non-absorption components shall be installed per Section R317-4-6 and Section R317-4-13 Table 2.
(C) Certification Requirement
(I) Any membrane bioreactor manufacturer shall submit NSF/ANSI Standard 40 - Residential Wastewater Treatment Systems certification for any model proposed to be approved for use in Utah.
(I.a) The Division may approve any membrane bioreactor model as equivalent to an NSF certified model, if the manufacturer submits a written recommendation bearing the seal of a professional engineer licensed to practice in Utah who is certified as a Level 3 Onsite Professional as defined in R317-11.

R317-4-7. Construction and Installation.

(1) System Installation.

(a) Approved Plans.

The installer may not deviate from the approved plans or conditions of the construction permit without the approval of the designer and the reviewing regulatory authority.

(b) Installation Restrictions.

A regulatory authority may limit the time period or area in which a system can be installed to ensure that soil conditions, weather, groundwater, or other conditions do not adversely affect the reliability of the system.

(c) General Requirements.

(i) Prior to installation, all minimum setback distances shall be field verified.

(ii) Any absorption area shall be protected prior to and during site construction.

(iii) The regulatory authority may require a temporary barrier around the absorption area, including the replacement area for additional protection prior to and during any site construction. If necessary, a more permanent barrier may be required following construction.

(iv) All absorption excavations and piping shall be level within a tolerance of plus or minus 1 inch. The overall slope from effluent entry to terminus shall be no more than 4 inches per hundred feet.

(v) Any absorption system excavation shall be made such that the soil in the bottom and sides of the excavation is not compacted. Strict attention shall be given to the protection of the natural absorption properties of the soil.

(vi) Any absorption system may not be excavated when the soil is wet enough to smear or compact easily.

(vii) Any smeared or compacted surface should be raked to a depth of 1 inch, and loose material removed before the absorption system components are placed in the excavation.

(viii) Any open absorption system excavation shall be protected from surface runoff to prevent the entrance of silt and debris.

(ix) Any absorption system shall be backfilled with earth that is free from stones 10 inches or more in diameter.

(x) any distribution pipe may not be crushed or misaligned during backfilling. When backfilling, the earth shall be mounded slightly above the surface of the ground to allow for settlement and prevent depressions for surface ponding of water.

(xi) Final grading shall prevent ponding throughout the entire system area and promote surface water runoff.

(xii) Heavy wheeled equipment may not be driven in or over absorption systems prior to or during construction or backfilling.

(d) Building and Effluent Sewer.

(i) Pipe, pipe fittings, and similar materials comprising building and effluent sewers shall conform to the applicable standards as outlined in Section R317-4-13 Table 4.

(ii) Each length of pipe shall be stamped or marked as required by the International Plumbing Code.

(iii) Where two different sizes or types of pipe are connected, a proper type of fitting or conversion adapter shall be used.

(iv) All sewers:

(A) shall have watertight, root-proof joints; and

(B) may not receive any groundwater or surface runoff.

(v) any pipe shall be installed on a foundation of undisturbed earth, or stabilized earth that is not subject to settling.

(e) Tanks.

Tank installation shall conform to the following requirements.

(i) Any tank shall be installed on a level, stable base that will not settle.

(ii) The hole to receive the tank shall be large enough to permit the proper placement of the tank and backfill.

(iii) Where groundwater, rock or other undesirable protruding obstructions are encountered, the bottom of the hole shall be excavated an additional 6 inches, and backfilled with sand, crushed stone, or gravel to the proper grade.

(iv) Backfill around and over the septic tank shall be placed in such a manner as to prevent undue strain or damage to the tank or connected pipes.

(f) Absorption Systems.

(i) Cover shall be evenly graded over the entire absorption area.

(ii) Distribution and Drop Boxes.

(A) The inlet and outlet piping shall be sealed watertight to the sidewalls of the box.

(B) The box shall be provided with a means of access. Access shall be brought to final grade.

(C) The lid of the riser shall be adequate to prevent entrance of water, dirt or other foreign material, but made removable for observation and maintenance of the system.

(D) The top of the box shall be at least 6 inches below final grade.
(E) The box shall be installed on a level, stable base to ensure against tilting or settling, and to minimize movement from frost action.
(F) Any unused knock-out hole in boxes shall be sealed watertight.
(iii) The solid and distribution pipes shall be bedded true to line and grade, uniformly and continuously supported by firm, stable material.
(iv) No cracked, weakened, modified or otherwise damaged chamber or bundled synthetic aggregate units shall be used in any installation.
(g) Pressure Distribution.
(i) Installation practices shall follow the approved design.
(h) Alternative Systems.
(i) At-Grade and Mound Systems.
(A) The site shall be cleared of surface vegetation, without removing soil, and scarified to an approximate depth of 6 inches. Any furrows resulting from the scarification shall be perpendicular to any slope on the site.
(I) Rotary tilling is prohibited for scarification.
(B) The system may not be installed in wet or moist soil conditions.
(C) No equipment shall be driven over the scarified area.
(D) The site shall be graded such that surface water drains away from the system and adjoining area.
(ii) Packed bed media, sand lined trench, and membrane bioreactor systems installation practices shall follow the approved design.

R317-4-8. Final Inspections.

(1) Final Inspections.
The regulatory authority shall inspect the entire installation before backfilling to determine compliance with this rule. Some components or system types require additional testing or inspection methods as outlined in the following.
(a) Tank Water Tightness Testing.
Any tank shall be tested for water tightness prior to backfill.
(i) Any tank shall be filled 24 hours before the inspection to allow stabilization of the water level. Considering water absorption by the concrete, there may not be a change in the water level nor any water moving visibly into or out of the tank. Testing
shall be supervised by the regulatory authority. Tanks exhibiting obvious defects or leaks may not be approved unless such deficiencies are repaired to the satisfaction of the regulatory authority.
(A) The regulatory authority may allow two piece tanks, with the joint below the water level, to be backfilled up to 3 inches below the joint to provide adequate support to the seam of the tank.
(B) Any polyethylene or fiber glass tanks shall be backfilled as per manufacturers' recommendations.
(ii) If groundwater elevations inhibit the ability to visibly inspect the exterior of the tank, the tanks may be tested by their ability to exclude water.
(b) Distribution and Drop Boxes.
(i) any distribution or drop box should be installed level and the flow distribution lines shall be checked by filling the boxes with water up to the outlets.
(c) Pressure Distribution, Effluent Pumps.
(i) Verify the correct operation of the pump, controls, and alarm.
(d) Deep Wall Trenches, Seepage Pits.
(i) Verify the depth of the trench excavation.
(e) At Grade and Mound Systems.
(i) Verify the preparation of the original ground before the placement of fill.
(ii) Verify that the final cover meets requirements.
(f) Alternative and Experimental Systems.
(i) All additional inspections will be dictated by the complexity of the system and absorption system type as identified by the regulatory authority.
(g) Final Approval.
Final approval shall be issued by the regulatory authority prior to operation of the system, and shall include an as-built drawing of the completed system.

R317-4-9. Experimental Systems.

(1) Administrative Requirements.

(a) Where unusual conditions exist, experimental methods of onsite wastewater treatment and dispersal may be employed provided they are acceptable to the division and to the local health department having jurisdiction.
(b) When considering proposals for experimental onsite wastewater systems, the division or the local health departments may not be restricted by this rule provided that:
(i) the experimental system proposed is attempting to resolve an existing pollution or public health hazard, or when the experimental system proposal is for new construction, it has been predetermined that an acceptable back-up wastewater system will be installed in event of failure of the experiment;
(ii) the proposal for an experimental onsite wastewater system shall be in the name of and bear the signature of the person who will own the system; and
(iii) the person proposing to utilize an experimental system has the responsibility to maintain, correct, or replace the system in event of failure of the experiment.
(c) When sufficient, successful experience is established with experimental onsite wastewater systems, the division may designate them as approved alternative onsite wastewater systems.
(d) Following this approval of alternative onsite wastewater systems, the division may initiate rulemaking.
(2) General Requirements.
(a) Any experimental system shall be designed, installed and operated under the following conditions:
(i) The groundwater requirements shall be determined as described in Subsection R317-4-4(1)(b)(iv).
(ii) The local health department shall advise the owner of the system of the experimental status of that type of system. The advisory shall contain information concerning risk of failure, level of maintenance required, financial liability for repair, modification or replacement of a failed system and periodic monitoring requirements that are all specific to the type of system to be installed.
(iii) The local health department and the owner shall be provided with sufficient design, installation and operating information to produce a successful, properly operating installation.
(iv) The local health department is responsible for provision of, or oversight of an approved installation, inspection and maintenance and monitoring program for the systems. Such programs shall include approved procedures for complete periodic maintenance and monitoring of the systems.
(v) The local health department may impose more stringent design, installation, operating and monitoring conditions than those required by the division.
(vi) All failures, repairs or alterations shall be reported to the local health department. All repairs or alterations shall be approved by the local health department.
(b) When an experimental wastewater system exists on a property, notification of the existence of that system shall be recorded in the chain of title for that property.

R317-4-10. Wastewater Holding Tanks Administrative, Design, and Installation.

(1) Administrative Requirements.
(a) Any request for the use of a wastewater holding tank shall receive the written approval of the local health department prior to the installation of the holding tank and be administered under an annual operating permit.
(b) Wastewater holding tanks are only permitted:
(i) where an absorption system for an existing dwelling has failed and installation of a replacement absorption system is not practicable;
(ii) as a temporary, not to exceed one year, wastewater system for a new dwelling until a connection is made to an approved sewage collection system;
(iii) as a temporary, not to exceed one year, wastewater system that may include construction sites, labor camps, temporary mass gatherings, or emergency refuge sheltering; or
(iv) for other essential and unusual situations where both the division and the local health department having jurisdiction concur that the proposed holding tank will be designed, installed and maintained in a manner that provides long term protection of the waters of the state.
(A) Any request for the use of a wastewater holding tanks in this instance shall receive the written approval of both agencies prior to the installation of such devices.
(c) Except on those lots recorded and approved for wastewater holding tanks prior to May 21, 1984, wastewater holding tanks are not permitted for use in new housing subdivisions, or commercial, institutional, and recreational developments except in those instances where these devices are part of a specific watershed protection program acceptable to the division and the local health department having jurisdiction.
(2) General Requirements.
The design, site placement, installation, and maintenance of all wastewater holding tanks shall comply with the following:

(a) No wastewater holding tank may be installed and used unless plans and specifications covering its design and construction have been submitted to and approved by the appropriate regulatory authority.
(b) A statement accompanying the application, that a contract with an approved pumper per Rule R317-550 will be obtained stating that the tank will be pumped out periodically at regular intervals or as needed, and contents will be disposed in an approved manner.
(c) If authorization is necessary for disposal of wastewater at certain facilities, evidence of such authorization must be submitted for review.
(3) Basic Plan Information Required.
Depending on the individual site and circumstances, or as determined by the regulatory authority, some or all of the following plan information may be required.
(a) Applicant Information.
(i) The name, current address, and telephone number of the applicant.
(ii) Complete address, legal description of the property, or both, to be served by this onsite wastewater system.
(b) A plot or site plan showing:
(i) Direction of North;
(ii) Estimated daily wastewater flow;
(iii) Location and liquid capacity of wastewater holding tank;
(iv) Source and location of water supply;
(v) Location of water service line and building sewer; and
(vi) Location of streams, ditches, watercourses, ponds, etc., near property.
(c) Plan detail of wastewater holding tank and high wastewater level warning device.
(d) Relative elevations of:
(i) Building floor drain;
(ii) Building sewer;
(iii) Invert of inlet for tank;
(iv) Lowest plumbing fixture or drain in building served; and
(v) The maximum liquid level of the tank.
(e) Statement indicating the maximum anticipated groundwater table.
(4) Construction.
(a) The tank shall be constructed of sound and durable material not subject to excessive corrosion and decay and designed to withstand hydrostatic and external loads. All wastewater holding tanks shall comply with the manufacturing materials and construction requirements specified for septic tanks.
(b) Construction of the tank shall be such as to assure water tightness and to prevent the entrance of rainwater, surface drainage or groundwater.
(c) Any tank shall be provided with a maintenance access manhole at the ground surface or above and of at least 18 inches in diameter. Any access cover shall have adequate handles and shall be designed and constructed in such a manner that they cannot pass through the access opening, and when closed will be child-proof and prevent entrance of surface water, dirt, or other foreign material, and seal the odorous gases in the tank.
(d) A high water warning device shall be installed on each tank to indicate when it is within 75% of being full.
(i) This device shall be either an audible or a visual alarm.
(A) Any visual alarm shall be conspicuously mounted.
(ii) Any wiring and mechanical part of such device shall be corrosion resistant.
(iii) Any conduit passage way through the tank top or wall shall be water and vapor tight.
(e) No overflow, vent, or other opening may be provided in the tank other than those described above.
(f) The regulatory authority may require that any wastewater holding tank be filled with water and allowed to stand overnight to check for leaks. Any tank exhibiting obvious defects or leaks may not be approved unless such deficiencies are repaired to the satisfaction of the regulatory authority.
(g) The building sewer shall comply with this rule.
(h) Any above ground holding tank shall be clearly labeled as "Sewage".
(5) Capacity.
The liquid capacity of the wastewater holding tank shall be based on wastewater flows for the type of dwelling or facility being served as identified in Section R317-4-13 Table 3 and on the desired time period between each pumping.
(a) The minimum capacity of underground wastewater holding tanks shall be 1,000 gallons.
(6) Location.Any wastewater holding tank must be located:
(a) In an area readily accessible to the pump truck in any type of weather that is likely to occur during the period of use;

(b) In accordance with the requirements for septic tanks as specified in Section R317-4-13 Table 2; and
(c) Where it will not tend to float out of the ground due to a high groundwater table or a saturated soil condition, since it will be empty or only partially full most of the time. In areas where the groundwater table may be high enough to float the tank out of the ground when empty or partially full, adequate ground anchoring procedures shall be provided.
(7) Management.
(a) Any wastewater holding tank shall be pumped periodically, at regular intervals or as needed, and the wastewater contents shall be disposed of in a manner and at a facility meeting the approval of the appropriate regulatory authority.
(b) Any wastewater holding tank for seasonal dwellings should be pumped out before each winter season to prevent freezing and possible rupture of the tank.
(c) A record of the liquid waste hauler, pumping dates, and amounts pumped shall be maintained and made available to the appropriate regulatory authorities upon request.
(d) Any wastewater holding tank shall be checked at frequent intervals by the owner or occupant and if leakage is detected it shall be immediately reported to the regulatory authority.
(e) Any repair or replacement shall be conducted under the direction of the regulatory authority.
(f) Improper location, construction, operation, or maintenance of a particular holding tank may result in appropriate legal action against the owner by the regulatory authority having jurisdiction.
(g) Any holding tank installed under this rule, shall be inspected upon renewal of the operating permit.

R317-4-11. Operation and Maintenance of Systems.

(1) Purpose.
The purpose of this section is to diminish the possibility of onsite wastewater system failures by informing the owners of required periodic maintenance, servicing, and monitoring. More complex systems will require a higher level of operation and maintenance.
(2) Conventional Systems.
Any conventional system should be assessed after the first year of operation, and thereafter at the following minimum frequency.
(a) Any system with daily flows between 1 and 3,000 gallons: every three years.
(b) Any system with daily flows between 3,001 and 5,000 gallons: every two years.
(c) Any system with non-domestic wastewater flows: yearly.
(3) Pressure Distribution.
(a) Any system utilizing pressure distribution shall be inspected as outlined in Section R317-4-13 Tables 7.1 and 7.2.
(4) Alternative Systems.
(a) Any alternative system shall be inspected as outlined in Section R317-4-13 Tables 7.1 and 7.2.
(b) Any packed bed media system shall be sampled a minimum of every six months as outlined in Section R317-4-13 Table 7.3.
(i) Any grab sample shall be taken before discharge to an absorption system.
(ii) Effluent not meeting the standards of Section R317-4-13 Table 7.3 shall be followed with two successive weekly tests of the same type within a 30-day period from the first exceedance.
(iii) If two successive samples exceed the minimum standards, the system shall be deemed to be malfunctioning, and shall require further evaluation and a corrective action plan, see Subsection R317-4-3(11).
(A) Effluent quality testing shall continue every two weeks until three successive samples are found to be in compliance.
(c) Any membrane bioreactor system shall be sampled a minimum of every three months as outlined in Section R317-4-13 Table 7.3.
(i) Any grab sample shall be taken before discharge to an absorption system.
(ii) Effluent not meeting the standards of Section R317-4-13 Table 7.3 shall be followed with two successive weekly tests of the same type within a 30-day period from the first exceedance.
(iii) If two successive samples exceed the minimum standards, the system shall be deemed to be malfunctioning, and shall require further evaluation and a corrective action plan, see Subsection R317-4-3(11).
(A) Effluent quality testing shall continue every two weeks until three successive samples are found to be in compliance.
(5) Tank Servicing.
For recommended tank servicing see Section R317-4-14 Appendix E.
(6) Distribution and Drop Box Maintenance.

Any distribution or drop box, if provided, should be inspected and cleaned periodically.
(7) Repair of a Malfunctioning System.
If corrective action is required see Subsection R317-4-3(11).

R317-4-12. Design Requirements.

(1) Reasons for a Variance.
An applicant may request a variance from any requirement of this rule only when a property has been deemed not feasible for the design or construction of an onsite wastewater system. A variance may not be granted for separation distances from public culinary water sources.
(2) Conditions for a Variance.
A variance may not be approved unless the applicant demonstrates that all of the following conditions are met:
(a) An onsite wastewater system consistent with this rule and local health department requirements cannot be constructed and a connection to a public or community-based sewerage system is not available or practicable. This determination will be made by the local health department.
(b) Wastewater from the proposed onsite wastewater system will not:
(i) contaminate groundwater or surface water; and
(ii) surface or move off site before it is adequately treated to protect public health and the environment.
(c)The proposed system will result in equal or greater protection of public health and the environment than is required by meeting the minimum standards and intent of this rule.
(d) Adjacent properties, including the current and reasonably anticipated uses of adjacent properties, will not be jeopardized if the proposed system is constructed, operated, and maintained.
(3) Procedure for Requesting a Variance.
(a) Any variance request shall include the information and documentation described in Subsection R317-4-12(5).
(b) The local health department shall review the variance request and prepare a written determination outlining the conditions of approval or denial of the request. The review shall identify the factors considered in the process and specify the basis for the determination.
(4) Variance Approvals.
(a) A variance will not be approved unless the applicant demonstrates that all of the conditions in Subsection R317-4-12(2) are met.
(b) A local health department may not issue an approval or an operating permit for an onsite wastewater system that does not comply with this rule unless a variance has been approved.
(c) Notice of the conditions shall be recorded in the chain of title for the property in the office of the county recorder. The notice shall include:
(i) The description of the system and variance conditions;
(ii) Operation and maintenance requirements;
(iii) Permission for the regulatory authority to access the property for the purpose of inspection and monitoring of the system; and
(iv) Owner responsibilities to correct, repair, or replace the system at the direction of the regulatory agency.
(5) Application Requirements.
Any variance application shall include all information and documentation necessary to ensure that the standards in Subsection R317-4-12(2) will be met.
(a) As appropriate, the information required under this section shall be submitted in a report by a professional engineer or a professional geologist that is certified at the appropriate level to perform onsite wastewater system design. An engineer or geologist who submits a report shall be licensed to practice in Utah and shall have sufficient experience and expertise to make the determinations in the report. Any such report shall include the engineer's or geologist's name and registration number, and a summary of qualifications. The report shall be imprinted with the engineer's or geologist's registration seal and signature. Information shall include at least the following.
(i) Information demonstrating that connection to a public or community-based sewerage system is not available or practicable.
(ii) Technical justification and appropriate engineering, geotechnical, hydrogeologic, and reliability information justifying the request for a variance and how the conditions in 12.2 will be met.
(iii) A detailed description of the proposed system, including a detailed explanation of wastewater treatment technologies allowed by this rule that have been considered for use, and that will provide the best available treatment.
(iv) A statement of alternatives considered in lieu of a variance.

(v) An operation, maintenance, and troubleshooting plan to keep the installed system operating as described in the application.
(vi) Documentation provided by the local health department that the adjoining land owners have been notified and provided opportunity for comment on the proposed variance.

R317-4-13. Tables.

TABLE 1.1

Minimum Lot Size(a) by Soil Type and Culinary Water Source

Soil Type	Public Water Supply	Non-public Water Supply(b)
1	12,000 sq. ft.	1 Acre
2	15,000 sq. ft.	1.25 Acres
3	18,000 sq. ft.	1.5 Acres
4	20,000 sq. ft.	1.75 Acres
5(c)	20,000 sq. ft.(c)	1.75 Acres (c)

TABLE 1.2

Soil Type Key(d)

Soil Type	Soil Texture(e)	Soil Structure	Percolation Rate (minutes per inch)
1	Coarse Sand, Sand, Loamy Coarse Sand, Loamy Sand	Single Grain	1-10
2	Fine Sand, Very Fine Sand, Loamy Fine Sand, Loamy Very Fine Sand	Single Grain	11-20
3	Coarse Sandy Loam, Sandy Loam	Prismatic, Blocky, Granular	21-40
4	Coarse Sandy Loam, Sandy Loam	Massive, Platy	41-60
	Fine Sandy Loam, Very Fine Sandy Loam, Loam, Silt Loam	Prismatic, Blocky, Granular	
5	Fine Sandy Loam, Very Fine Sandy Loam, Loam, Silt Loam, Sandy Clay Loam, Clay Loam, Silty Clay Loam	Massive	61-120
	Sandy Clay Loam, Clay Loam, Silty Clay Loam, Sandy Clay, Clay, Silty Clay, Silt	Prismatic, Blocky, Granular	

6(f)	Sandy Clay Loam, Clay Loam, Silty Clay Loam Sandy Clay, Clay, Silty Clay, Silt	Platy Massive, Platy	>120

NOTES

(a) Excluding public streets and alleys or other public rights-of-way, lands or any portion thereof abutting on, running through or within a building lot for a single-family dwelling. These minimum lot size requirements do not apply to building lots that have received final local health department approval prior to the adoption of this rule.

Lots that are part of subdivisions that have received final local health department approval prior to the adoption of this rule are only exempt from the minimum lot size requirements if the developer has and is proceeding with reasonable diligence. Notwithstanding this grandfather provision for approved lots, the minimum lot size requirements are applicable if compelling or countervailing public health interests would necessitate application of these more stringent requirements. The shape of the lot shall also be acceptable to the regulatory authority.

(b) See the separation requirements in Section R317-4-13 Table 2.

(c) Packed bed media or membrane bioreactor systems are required for this soil type.

(d) When there is a substantial discrepancy between the percolation rate and the soil classification, it shall be resolved to the satisfaction of the regulatory authority, or the soil type requiring the largest lot shall be used.

(e) See the USDA soil classification system for a more detailed description.

(f) These soils are unsuitable for any absorption system.

TABLE 2

Minimum Separation Distances in Feet(a)

Item Requiring Setback	From Building Sewers and Effluent Sewers	From Septic, Pump, and Other Tanks	From Absorption Area and Replacement Area
Absorption and Replacement Areas		5	(b)
Public Culinary Water Sources	(c)	100(c)	100(c)
Individual or Non-public Culinary Water Sources(d)	25	50	100(e)
Culinary Water Supply Line	(f)	10(f)	10(f)
Non-culinary Well or Spring	10	25	100
Lake, Pond or	10	25	100

Reservoir (a)			
Watercourse (live or ephemeral stream, river, subsurface drain, canal or storm water system,		25	100(g)
Building Foundation			
Without foundation drain		5	5(h)
With foundation drain		10	100(i)
Curtain drain	10	10	100(i)
Dry wash, gulch or gully		25	50
Swimming pool, below ground	3	10	25
Dry well or catch basins		5	25
Down slope that exceeds 35%. This includes any natural slope or escarpment and any manmade cut, retaining wall, or embankment.		10	50(j)
Property line	5	5	5

NOTES

(a) All distances are from edge to edge. Where surface waters are involved, the distance shall be measured from the high water line.

(b) See Subsection R317-4-6.14 for setback requirements.

(c) All distances shall be consistent with Rules R309-600 and R309-605.

(d) Compliance with separation requirements does not guarantee acceptable water quality in every instance. Where any geological or other condition warrants, greater distance may be required by the regulatory authority.

(e) For any ungrouted well or spring the distance shall be 200 feet. A private or individual well is considered to be grouted if it meets the construction standards required in Section R655-4-11, which requires a minimum 30-foot deep grout surface seal. any private or individual well not constructed to this minimum standard is considered to be ungrouted. Although this distance shall be generally adhered to as the minimum required separation distance, exceptions maybe approved by the regulatory authority, taking into account geology, hydrology, topography, existing land use agreements, consideration of the drinking water source protection requirements, protection of public health and potential for pollution of water source. Any person proposing to locate any absorption system closer than 200 feet to an individual or nonpublic ungrouted well or spring must submit a report to the regulatory authority that considers the above items. In no case shall the regulatory authority grant approval for an onsite

wastewater system to be closer than 100 feet from an ungrouted well or a spring.
f) If the water supply line is for a public water supply, the separation distance shall comply with the requirements of Rule R309-550. No culinary water service line shall pass through any portion of an absorption area.
(g) Lining or enclosing a watercourse with an acceptable impervious material may permit a reduction in the separation requirement. In a situation where the bottom of a canal or watercourse is at a higher elevation than the ground in which the absorption system is to be installed, a reduction in the distance requirement may be justified, but each case shall be decided on its own merits by the regulatory authority.
(h) Horizontal setback between a deep wall trench or seepage pit and a foundation of any building is at least 20 feet.
(i) The regulatory authority may reduce the separation distance, if it can be shown that the effluent will not enter the drain, but each case must be decided on its own merits by the regulatory authority. In no case shall the regulatory authority grant approval for an absorption area to be closer than 20 feet.
(j) This setback may be reduced if a 53 foot reference line originating at the bottom of the distribution pipe, sloped at 35% below horizontal, will not daylight or intersect the ground surface.

TABLE 3

Estimated Flow Rates of Wastewater(a)

Type of Establishment	Gallons per Day
Airports	
a. per passenger	3
b. per employee	15
Boarding and Rooming Houses	
a. for each resident boarder and employee	50 per person
b. additional for each nonresident boarder	10 per person
Bowling Alleys, not including food service	85 per alley
Camps	
a. developed with flush toilets and showers	30 per person
b. developed with flush toilets	20 per person
c. developed with no flush toilets	5 per person
Churches	5 per person
Condominiums, Multiple Family Dwellings, or Apartments	150 per bedroom
Dentist’s Office	
a. per chair	200
b. per staff member	35
Doctor's Office	
a. per patient	10
b. per staff member	35
Fairgrounds	1 per person

Fire Stations	
a. with full-time employees and food preparation	70 per person
b. with no full-time employees and no food preparation	5 per person
Food Service Establishment(b)	
a. ordinary restaurant, not 24 hour service	35 per seat
b. 24 hour service	50 per seat
c. single service utensils only	2 per customer
d. or, per customer served, includes toilet and kitchen wastes	10 per customer
Gym	
a. participant and staff member	25 per person
b. spectator	4 per person
Hairdresser	65 per chair
Highway Rest Stop, improved with restroom facilities	5 per vehicle
Hospital	250 per bed space
Hotel, Motel, or Resort	125 per unit
Industrial Building, exclusive of industrial waste	
a. with showers, per 8 hour shift	35 per person
b. with no showers, per 8 hour shift	15 per person
Labor or Construction Camp	50 per person
Launderette	580 per washer
Mobile Home Park	400 per unit
Movie Theater	
a. auditorium	5 per seat
b. drive-in	10 per car
Nursing Home	200 per bed
Office Building or Business Establishments, not including food service, per eight hour shift	15 per person
Picnic Park, toilet wastes only	5 per person
Recreational Vehicle Park	
a. temporary or transient with no sewer connections	50 per space
b. temporary or transient with sewer connection	125 per space
Recreational Vehicle Dump Station, per self-contained vehicle	50
School	
a. boarding	75 per person
b. day, without cafeteria, gymnasium or showers	15 per person
c. day, with cafeteria, but no gymnasium or showers	20 per person
d. day, with cafeteria, gymnasium and showers	25 per person
Service Station, per day, per pump	250
Skating Rink, Dance Hall, Ski Area	10 per person
Store, including Convenience Store	
a. per public toilet room	500
b. per employee	11
Swimming Pool and Bathhouse, using Maximum Bather Load	10 per person

Tavern, Bar, Cocktail lounge with No Food Service	20 per seat
Visitor Center	5 per visitor

NOTES
(a) When more than one use will occur, the multiple use shall be considered in determining total flow. A small industrial plant maintaining a cafeteria or showers and a club house or motel maintaining a swimming pool or laundry are typical examples of multiple uses. Any use other than those listed above shall be considered in relation to established flows from known or similar installations.
(b) No commercial food waste disposal unit shall be connected to an onsite wastewater system unless first approved by the regulatory authority.

TABLE 4

Minimum Standards for Building Sewer, Effluent Sewer, and Distribution Pipe Materials(a)

Acceptable Building Sewer and Effluent Sewer Materials

Type of Pipe	Minimum Standard
Acrylonitrile-Butadiene Styrene (ABS)	ASTM(b) D-2680(c), D-2751, F-628
Polyvinyl Chloride (PVC)	ASTM D-2665, D-3033, D-3034

Acceptable Distribution Pipe Materials

Type of Pipe	Minimum Standard
ABS	ASTM D-2661, D-2751
Polyethylene (PE), Smooth Wall	ASTM D-3350
PVC	ASTM D-2665, D-3033, D-3034, D-2729(d)

NOTES
(a) Each length of building sewer, effluent sewer, and distribution pipe shall be stamped or marked.
(b) American Society for Testing and Materials.
(c) For domestic wastewater only, free from industrial wastes.
(d) Although perforated PVC, ASTM D-2729 is approved for absorption system application, the solid-wall version of this pipe is not approved for any application.

TABLE 5

Maximum Hydraulic Percolation Rate (Minutes per Inch)	Loading Rates for Absorption System Hydraulic Loading Rates(a) (gal/ft2/day) (c)(d)(e)	Percolation Testing Absorption Bed and Mound System Hydraulic Loading Rates(b) (gal/ft2/day) (c)(d)(f)
0-10(g)	0.90	0.45
11-20	0.70	0.35
21-30	0.60	0.3
31-40	0.55	0.27
41-50	0.50	0.25(h)
51-60	0.45	0.22(h)
61-90(i)	0.40	(j)

91-120(i) 0.35 (j)

NOTES

(a) The following formula may be used in place of the values in this table: q = 2.35 divided by the square root of the percolation rate and then add 0.15 where q is the hydraulic loading rate. In no case shall the loading rate be greater than 1.0.

(b) The following formula may be used in place of the values in this table: q = 1.2 divided by the square root of the percolation rate and then add 0.08 where q is the hydraulic loading rate. In no case shall the loading rate be greater than 0.5.

(c) Minimum absorption area is equal to the actual or estimated wastewater flow in gallons per day shown in Section R317-4-13 Table 3, divided by the hydraulic loading rate within the applicable percolation rate category.

(d) For any non-residential facility, if a garbage grinder is not used, the absorption area may be reduced by 10% (0.9 multiplier). If any automatic sequence washer is not used, the absorption area may be reduced by 30% (0.7 multiplier). If both of these appliances are not used, the absorption area may be reduced by 40% (0.6 multiplier).

(e) For any non-residential facility, a minimum of 150 square feet of trench bottom or sidewall absorption area shall be provided.

(f) For any non-residential facility, a minimum of 300 square feet of absorption area shall be provided.

(g) Soils with a percolation rate faster than 1 minute per inch are only acceptable with the use of an alternative packed bed media or membrane bioreactor system with a disinfection unit.

(h) Not suitable for absorption beds.

(i) Acceptable for alternative packed bed media or membrane bioreactor systems only.

(j) Not suitable for absorption beds or mounds.

TABLE 6

Maximum Hydraulic Loading Rates for Soil Classification

Texture	Structure	Absorption System Hydraulic Loading Rate(a) (gal/ft2/day) (c)(d)(e)	Absorption Bed and Mound System Hydraulic Loading Rate(b) (gal/ft2/day) (c)(d)(f)
Coarse sand, sand, loamy coarse sand, loamy sand	Single grain	0.9(e)	0.45(e)
Fine sand, very fine sand, loamy fine sand, loamy very fine sand	Single grain	0.7	0.35
Coarse sandy	Massive	0.45	0.22(f)

loam, sandy	Platy	0.5	0.25(f)
loam	Prismatic, blocky, granular	0.65	0.32
Fine sandy	Massive	0.4	(g)
loam, very	Platy	0.35	(g)
fine sandy	Prismatic,	0.5	0.25(f)
loam	blocky, granular		
Loam	Massive	0.4	(g)
	Platy	(e)	(g)
	Prismatic, blocky, granular	0.5	0.25(f)
Silt loam	Massive	(e)	(g)
	Platy	(e)	(g)
	Prismatic, blocky, granular	0.45	0.22(f)
Sandy clay	Massive	(e)(h)	(g)
loam, clay	Platy	(i)	(i)
loam, silty	Prismatic,	0.4(e)(h)	(g)
clay loam	blocky, granular		
Silt, silty	Massive	(i)	(i)
clay, sandy	Platy	(i)	(i)
clay, clay	Prismatic, blocky, granular	0.35(e)(h)	(g)

NOTES

(a) Minimum absorption area is equal to the actual or estimated wastewater flow in gallons per day, using Section R317-4-13 Table 3, divided by the hydraulic loading rate within the applicable soil texture and structure category.

(b) For any non-residential facility, if a garbage grinder is not used, the absorption area may be reduced by 10% (0.9 multiplier). If any automatic sequence washer is not used, the absorption area may be reduced by 30% (0.7 multiplier). If both of these appliances are not used, the absorption area may be reduced by 40% (0.6 multiplier).

(c) For any non-residential facility, a minimum of 150 square feet of trench bottom or sidewall absorption area shall be provided.

(d) For any non-residential facility, a minimum of 300 square feet of absorption area shall be provided.

(e) These soils are usually considered unsuitable for absorption systems, but may be suitable, depending upon the percentage and type of fines in coarse grained porous soils, and the percentage of sand and structure in fine grained soils. Percolation testing shall be used for further evaluation.

(f) Not suitable for absorption beds.

(g) Not suitable for absorption beds or mounds.

(h) These soils may be permissible for packed bed media or membrane bioreactor absorption systems only.

(i) These soils are unsuitable for any absorption system.

TABLE 7.1

Alternative Onsite Wastewater System
Minimum Inspection Frequency(a)

Type of System	Annual	Semi-annual	Quarterly
Pressure Distribution		X	
At-Grade(first 5 years only)	X		
Mound		X	
Packed Bed Media		X	
Sand Lined Trench		X	
Membrane Bioreactor			X
Holding Tank	X		
Experimental System		X	

NOTES
(a) Or more frequently as directed by the regulatory authority.

TABLE 7.2

Inspection of Alternative Onsite Wastewater System Components(a)

Type	Septic Tanks and Other Tanks	Distribution or Drop Boxes (if accessible)	Pumps, Float Settings, Control Panel	MBR-Filter	Pressure Laterals, Absorption Area	Disinfection Unit(c)
Pressure Distribution	X	X	X		X	
At-Grade	X	X	X		X	
Mound	X		X		X	
Packed Bed Media	X	X	X		X	X
Sand Lined Trench	X	X	X		X	
Membrane Bioreactor	X	X	X	X	X	X
Holding Tank(b)	X		X			
Experimental	X	X	X	X(a)	X	X(a)

NOTES
(a) Inspect other components as directed by the regulatory authority.
(b) Including pumping records.
(c) Required for absorption systems installed in excessively permeable soils, or as directed by the regulatory authority.

TABLE 7.3

Alternative Onsite Wastewater System

Effluent Sampling Parameters
Packed Bed Media and Membrane Bioreactor System
Routine Sampling Parameters
Must sample Turbidity, or BOD5 and TSS.

Field Test	Maximum Value
Turbidity	=<20 NTU
Laboratory Test	Maximum Value
BOD5	=<25 mg/l
TSS	=<25 mg/l
COD(a)	=<75 mg/l
E. coli(b)	<126/100 ml

NOTES
(a) Chemical oxygen demand (COD) may be used in place of BOD5.
(b) E. coli testing is required when any disinfection unit is installed.

R317-4-14. Appendices.
Appendix A. Septic Tank Construction.

(1) Plans for Tanks Required.
Plans for any septic tank or underground holding tank shall be submitted to the division for approval. Such plans shall show all dimensions, capacities, reinforcing, maximum depth of soil cover, and such other pertinent data as may be required. All tanks shall conform to the design drawing and shall be constructed under strict, controlled supervision by the manufacturer.
(a) Precast Reinforced Concrete Tanks.
(i) The walls and base of precast tanks shall be securely bonded together and the walls shall be of monolithic or keyed construction.
(ii) The sidewalls and bottom of such tanks shall be at least 3 inches in thickness.
(iii) The top shall have a minimum thickness of 4 inches.
(iv) Such tanks shall have reinforcing of at least 6 inch x 6 inch No. 6, welded wire fabric, or equivalent. Exceptions to this reinforcing requirement may be considered by the division based on an evaluation of acceptable structural engineering data submitted by the manufacturer.
(v) All concrete used in precast tanks shall be Class A, at least 4,000 pounds per square inch, and shall be vibrated or well-rodded to minimize honeycombing and to assure water tightness.
(vi) Precast sections shall be set evenly in a full bed of sealant. If grout is used it shall consist of two parts plaster sand to one part cement with sufficient water added to make the grout flow under its own weight.
(vii) Excessively mortared joints should be trimmed flush.
(viii) The inside and outside of each mortar joint shall be sealed with a waterproof bituminous sealing compound.
(ix) For the purpose of early reuse of forms, the concrete may be steam cured. Other curing by means of water spraying or a membrane curing compound may be used and shall comply to best acceptable methods as outlined in Guide to Curing Concrete, ACI308R-01, by American Concrete Institute, Farmington Hills, Michigan.
(b) Poured-In-Place Concrete Septic Tanks.
(i) The top of poured-in-place septic tanks with a liquid capacity of 1,000 to 1,250 gallons shall be a minimum of 4 inches thick, and reinforced with 3/8 inch reinforcing rods 12 inches on center both ways, or equivalent.
(ii) The top of tanks with a liquid capacity of greater than 1,250 gallons shall be a minimum of 6 inches thick, and reinforced with 3/8 inch reinforcing rods 8 inches on center both ways, or equivalent.
(iii) The walls and floor shall be a minimum of 6 inches thick. The walls shall be reinforced with 3/8 inch reinforcing rods 8 inches on center both ways, or equivalent. Inspections by the regulatory authority may be required of the tank reinforcing steel before any concrete is poured.
(iv) A 6 inch water stop shall be used at the wall-floor juncture to ensure water tightness.
(v) All concrete used in poured-in-place tanks shall be Class A, at least 4,000 pounds per square inch, and shall be vibrated or well-rodded to minimize honeycombing and to ensure water tightness.
(vi) Curing of concrete shall comply with the requirements in Subsection R317-4-14 Appendix A.1.2.
(c) Fiberglass Tanks.
(i) Fiberglass tanks shall comply with one of the following criteria for acceptance.

(A) The Interim Guide Criteria for Glass-Fiber-Reinforced Polyester Septic Tanks, International Association of Plumbing and Mechanical Officials Z1000-2007. The identifying seal of the International Association of Plumbing and Mechanical Officials shall be permanently embossed in the fiberglass as evidence of compliance.
(B) Manufactured to meet the structural requirements of Underwriters Laboratories (UL) Standard 1316.
(C) Professionally engineered plans demonstrating compliance to tank configuration requirements of this rule including acceptable structural calculations or other pertinent data as may be required.
(ii) Any inlet or outlet tee shall be attached to the tank by a rubber or synthetic rubber ring seal and compression plate, or in some other manner approved by the division.
(iii) The tank shall be installed in accordance with the manufacturer's recommendations.
(d) Polyethylene Tanks.
(i) any polyethylene tank shall comply with the criteria for acceptance established in Prefabricated Septic Tanks and Wastewater Holding Tanks, Can3-B66-10 by the Canadian Standards Association, Ontario, Canada.
(ii) Any inlet or outlet tee shall be attached to the tank by a rubber or synthetic rubber ring seal and compression plate, or in some other manner approved by the division.
(iii) The tank shall be installed in accordance with the manufacturer's recommendations.
(2) Identifying Marks.
(a) All prefabricated or precast tanks that are commercially manufactured shall be plainly, legibly, and permanently marked or stamped with:
(i) the manufacturer's name and address, or nationally registered trademark;
(ii) the liquid capacity of the tank in gallons on the exterior at the outlet end within 6 inches of the top of the wall; and
(iii) the inlet and outlet of all such tanks shall be plainly marked as "IN" or "OUT" respectively.
(3) Inlets and Outlets.
Any inlets and outlets of tanks or compartments thereof shall meet the minimum diameter requirements for building sewers.
(a) Only one inlet or outlet is allowed, unless preauthorized by the regulatory authority.
(b) Inlets and outlets shall be located on opposite ends of the tank.
(i) The invert of flow line of the inlet shall be located at least 2 inches, above the invert of the outlet to allow for momentary rise in liquid level during discharge to the tank.
(ii) An approved tank with offset inlets may be used when approved by the regulatory authority.
(c) Any inlet or outlet shall have a baffle or sanitary tee.
(i) An inlet baffle or sanitary tee of wide sweep design shall be provided to divert the incoming wastewater downward. This baffle or tee is to penetrate at least 6 inches below the liquid level, but the penetration is not to be greater than that allowed for the outlet device.
(ii) For tanks with vertical sides, outlet baffles or sanitary tees shall extend below the liquid surface a distance equal to approximately 40% of the liquid depth. For horizontal cylindrical tanks and tanks of other shapes, that distance shall be reduced to approximately 35% of the liquid depth.
(iii) Any baffle shall be constructed from sidewall to sidewall or shall be designed as a conduit.
(iv) Any sanitary tee shall be permanently fastened in a vertical, rigid position.
(d) Any inlet or outlet pipe connection to the septic tank shall be sealed and adhere to the tank and pipe to form a watertight connection with a bonding compound or a sealing ring.
(e) Any inlet or outlet device may not include any design feature preventing free venting of gases generated in the tank or absorption system back through the roof vent in the building plumbing system. The top of any baffle or sanitary tee shall extend at least 6 inches above the liquid level in order to provide scum storage, but no closer than 1 inch to the inside top of the tank.
(4) Liquid Depth of Tanks.
Liquid depth of tanks shall be at least 30 inches. Depth in excess of 72 inches may only be considered in calculating liquid volume required in Subsection R317-4-6(6) if the tank length is at least two times the liquid depth.
(5) Burial Depth.
The maximum burial depth shall be stated on the plans submitted.
(6) Tank Compartments.
Any septic tank may be divided into compartments provided it meets the following:
(a) The volume of the first compartment shall equal or exceed two-thirds of the total required septic tank volume;
(b) No compartment may have an inside horizontal dimension less than 24 inches;

(c) Any inlet or outlet shall be designed as specified for a tank, except that when a partition wall is used to form a multi-compartment tank, an opening in the partition may serve for flow between compartments provided the minimum dimension of the opening is 4 inches, the cross-sectional area is not less than that of a 6 inch diameter pipe (28.3 square inches), and the mid-point is below the liquid surface a distance approximately equal to 40% of the liquid depth of the tank.

(7) Scum Storage.

Scum storage volume shall consist of 15% or more of the required liquid capacity of the tank and shall be provided in the space between the liquid surface and the top of inlet and outlet devices.

(8) Access to Tank Interior.

Adequate access to the tank shall be provided to facilitate inspection, servicing and maintenance, and shall have no structure or other obstruction placed over it and shall conform to the following requirements:

(a) Access to each compartment of the tank shall be provided through properly placed manhole openings not less than 18 inches in diameter, in minimum horizontal dimension or by means of an easily removable lid section.

(b) Any access cover shall be designed and constructed in such a manner that it may not pass through the access opening, and when closed will be child-proof and prevent entrance of surface water, dirt, or other foreign material, and seal the odorous gases in the tank. Any concrete access cover for a manhole opening shall have adequate handles.

(c) Access to inlet and outlet devices shall be provided through properly spaced openings not less than 12 inches in minimum horizontal dimension or by means of an easily removable lid section.

Appendix B. Pressure Distribution, Pumps, Controls, and Alarms.

(1) Design.

The design of an onsite wastewater system shall generally be based on the Utah Guidance for Performance, Application, Design, Operation and Maintenance: Pressure Distribution Systems document with the following exceptions:

(a) Design and equipment shall emphasize ease of maintenance, longevity, and reliability of components and shall be proven suitable by operational experience, test, or analysis, acceptable to the regulatory authority.

(b) Any electrical disconnect shall be provided that is appropriate for the installation and shall have a gas-tight junction box or splices. Any electrical component used in an onsite wastewater system shall comply with applicable requirements of the State of Utah Electrical Code.

(c) Any component shall be constructed and installed to facilitate ease of service without having to alter any other part.

(2) Pumps, Controls, and Alarms.

Prior to final approval for operation, any pumps, control or related apparatus shall be field tested and found to operate as designed.

(a) When a duplex pump system is designed, controls shall be provided that an alarm will signal when one of the pumps malfunctions.

(b) Where multiple pumps are operated in series, controls shall be installed to prevent the operation of a pump or pumps preceding a station that experiences a high level alarm event.

(c) Controls shall be capable of controlling all functions incorporated or required in the design of the system.

(i) The control panel for any pressure distribution system shall include a pump run-time hour meter and a pump event counter or other acceptable flow measurement method.

(ii) The control panel shall be installed within sight of the access risers.

(A) Other locations may be approved by the regulatory authority.

(iii) Supporting hydraulic calculations and pump curve analysis shall be submitted to the regulatory authority with the design.

Appendix C. Soil Exploration Pits, Soil Logs, Soil Evaluations.

(1) Soil Exploration Pit Construction.

Soil conditions shall be obtained from soil exploration pit(s) dug to a depth of 10 feet in the absorption area, or to the groundwater table if it is shallower than 10 feet below ground surface. In the event that absorption system excavations will be deeper than 6 feet, soil exploration pits shall extend to a depth of at least 4 feet below the bottom of the proposed absorption system excavation.

(a) Any soil exploration pit shall be constructed in a manner to reduce potential for physical injury. One end of any pit should be sloped gently or "stair-stepped" to permit easy entry if necessary.

(2) Soil Logs.

(a) Any soil log shall contain the following information.

(i) A signed statement certifying that the logs were evaluated and recorded in accordance with this rule.

(ii) The names of all qualified individuals per Rule R317-11 conducting the tests.
(iii) The location of the property.
(iv) The location of the soil exploration pit on the property.
(v) The date of the log.
(vi) A description and depths of the soil horizons throughout the soil exploration pit to include:
(A) Soil texture and structure using the USDA system of classification;
(B) Estimated volume percentage of coarse fragments defined as:
(I) "Gravel" means a rock fragment from 0.1 inches to 3 inches in diameter;
(II) "Cobble" means rock fragment from 3 inches to 10 inches in diameter;
(III) "Stone" means a rock fragment greater than 10 inches in diameter;
(C) The presence and abundance of mottling defined as:
(I) "Few" when less than 2% of the exposed surface is occupied by mottles;
(II) "Common" when from 2% to 20% of the exposed surface is occupied by mottles; and
(III) "Many" when more than 20% of the exposed surface is occupied by mottles;
(D) Depth to groundwater or bedrock, if encountered, and maximum anticipated groundwater table; and
(E) Other pertinent information.
(3) Soil Evaluation.
Any soil shall be evaluated using the USDA Soil Texture Classification method.
(a) The soil horizon with the lowest loading rate shall be used in calculating the required absorption area.

Appendix D. Percolation Method.

(1) Percolation Test Requirements.
any percolation test shall be completed by an individual certified per Rule R317-11 and shall be conducted in accordance with the instructions in this appendix.
(a) Typical Areas.
When percolation tests are conducted, such tests shall be conducted at points and elevations selected as typical of the area in which the absorption system will be located.
(b) Percolation Test Certificate.
any percolation test result shall be submitted on a signed "Percolation Test Certificate". The test certificate shall contain the following:
(i) A signed statement certifying that the tests were conducted in accordance with this rule.
(ii) The names of all individuals per Rule R317-11 conducting the tests.
(iii) The location of the property.
(iv) The location of the percolation tests on the property.
(v) The depth to the bottom of the percolation test hole from the existing grade.
(vi) The final stabilized percolation rate of each test in minutes per inch.
(vii) The date of the tests.
(viii) Other pertinent information.
(c) Specific Requirements.
any percolation test shall be conducted at the owner's expense and in accordance with the following:
(i) Conditions Prohibited for Test Holes.
any percolation test may not be conducted in a test hole that extends into groundwater, bedrock, or frozen ground. Where shrink-swell clays, fissured soil formations, or saprolite is encountered, any test shall be made under the direction of the regulatory authority.
(ii) Soil Exploration Pit Prerequisite to Percolation Tests.
Since the appropriate percolation test depth depends on the soil conditions at a specific site, the percolation test shall be conducted only after the soil exploration pit has been dug and examined for suitable and porous strata and groundwater table information. Percolation test results should be related to the soil conditions found.
(iii) Test Holes to Commence in Specially Prepared Excavations.
Any percolation test hole should commence in specially prepared larger excavations, preferably made with a backhoe, of sufficient size that extend to a depth approximately 6 inches above the strata to be tested.
(iv) Type, Depth, and Dimensions of Test Holes.
Any test hole shall be dug or bored, preferably with hand tools such as shovels or augers, etc., and shall have horizontal dimensions ranging from 4 to 18 inches, preferably 8 to 12 inches. The vertical sides shall be at least 12 inches deep, terminating in the soil at an elevation 6 inches below the bottom of the proposed onsite wastewater system. In testing individual soil strata for deep wall trenches and seepage pits, the percolation test hole shall be located entirely within the strata to be tested, if possible.
(v) Preparation of Percolation Test Hole.

Carefully remove any smeared soil surfaces to provide an open, natural soil interface into that water may percolate. Remove all loose soil from the bottom of the hole. Add 2 to 3 inches of clean pea gravel to protect the bottom from scouring or sealing with sediment when water is added. Caving or sloughing in some test holes can be prevented by placing in the test hole a wire cylinder or perforated pipe surrounded by clean pea gravel.

(vi) Saturation and Swelling of the Soil.

It is important to distinguish between saturation and swelling. Saturation means that the void spaces between soil particles are full of water. This can be accomplished in a relatively short period of time. Swelling is a soil volume increase caused by intrusion of water into the individual soil particles. This is a slow process, especially in clay-type soil, and is the reason for requiring a prolonged swelling period.

(vii) Placing Water in Test Holes.

Water should be placed carefully into the test holes by means of a small diameter siphon hose or other suitable method to prevent washing down the side of the hole.

(viii) Percolation Rate Measurement, General.

Necessary equipment should consist of a tape measure with at least 1/16 inch calibration or float gauge, and a time piece or other suitable equipment. All measurements shall be made from a fixed reference point near the top of the test hole to the surface of the water.

(ix) Percolation Test Procedure.

The hole shall be carefully filled with clear water and a minimum depth of 12 inches shall be maintained above the gravel for at least a four hour period by refilling whenever necessary. Water remaining in the hole after four hours may not be removed. Immediately following the saturation period, the soil shall be allowed to swell not less than 16 hours or more than 30 hours. Immediately following the soil swelling period, the percolation rate measurements shall be made as follows:

(A) Any soil that has sloughed into the hole shall be removed and water shall be adjusted to 6 inches over the gravel.

(B) From this fixed reference point, the water level shall be measured and recorded at approximately 30 minute intervals for a period of four hours.

(I) If 6 inches of water seeps away in less than 30 minutes, a shorter time interval of 15 minutes between measurements may be used.

(II) If 6 inches of water seeps away in less than 15 minutes, a shorter time interval of 5 minutes between measurements may be used.

(III) Eight consecutive time intervals shall be recorded unless two successive water level drops do not vary more than 1/16 of an inch and indicate that an approximate stabilized rate has been obtained.

(C) The hole shall be filled with 6 inches of clear water above the gravel after each time interval.

(D) In no case shall the water depth exceed 6 inches above the gravel.

(E) The final water level drop shall be used to calculate the percolation rate.

(I) If no stabilized rate is achieved, the smallest drop shall be used to make this calculation.

(F) Precautions shall be taken to prohibit water or soil from freezing during the test procedure.

(x) Test Procedure for Type 1 and Type 2 Soils.

The hole shall be carefully filled with clear water to a minimum depth of 12 inches over the gravel and the time for this amount of water to seep away shall be determined. The procedure shall be repeated and if the water from the second filling of the hole at least 12 inches above the gravel seeps away in 10 minutes or less, the test may proceed immediately as follows:

(A) Water shall be added to a point not more than 6 inches above the gravel.

(B) From this fixed reference point, water levels shall be measured at 10 minute intervals for a period of one hour.

(I) If 6 inches of water seeps away in less than 10 minutes, a shorter time interval of 5 minutes between measurements may be used.

(II) Six consecutive time intervals shall be recorded unless two successive water level drops do not vary more than 1/16 of an inch and indicate that an approximate stabilized rate has been obtained.

(C) The hole shall be filled with 6 inches of clear water above the gravel after each time interval.

(D) In no case shall the water depth exceed 6 inches above the gravel.

(E) The final water level drop shall be used to calculate the percolation rate.

(I) If no stabilized rate is achieved, the smallest drop shall be used to make this calculation.

(xi) Calculation of Percolation Rate.

The percolation rate is equal to the time elapsed in minutes for the water column to drop, divided by the distance the water dropped in inches and fractions thereof.

(xii) Using Percolation Rate to Determine Absorption Area.

The minimum or slowest percolation rate shall be used in calculating the required absorption area.

Appendix E. Tank Operation and Maintenance.

(1) Maintenance of Septic Tanks.

(a) Any septic tank shall be emptied before too much sludge or scum is allowed to accumulate and seriously reduce the tank volume settling depth. If either the settled solids or floating scum layer accumulate too close to the bottom of the outlet baffle or bottom of the sanitary tee pipe in the tank, solid particles will overflow into the absorption system and eventually clog the soil and ruin its absorption capacity.

(b) Any septic tank that receives normal loading should be inspected as indicated in Section R317-4-11 to determine if it needs emptying. Although there are wide differences in the rate that sludge and scum accumulate in tanks, a septic tank for a private residence will generally require emptying every three to five years. Actual measurement of scum and sludge accumulation is the only sure way to determine when a tank needs to be emptied. Experience for a particular system may indicate the desirability of longer or shorter intervals between inspections.

(c) The tank should be completely emptied if either the bottom of the floating scum mat is within 3 inches of the bottom of the outlet baffle or tee or the sludge level has built up to approximately 12 inches from the bottom of the outlet baffle or tee, or the scum and sludge layers together equal 40% or more of the tank volume. All scum and solids should be washed out and removed from the tank.

(d) If multiple tanks or tanks with multiple compartments are provided, care should be taken to ensure that each tank or compartment is inspected and emptied.

(e) Septic tank wastes contain disease causing organisms and shall be disposed of only in areas and in a manner that is acceptable to local health authorities and consistent with state rules.

(f) Immediate replacement of damaged inlet or outlet fittings in the septic tank is essential for effective operation of the system.

(g) Effluent screens or filters.

Remove the filter in a manner that prevents solids from passing to the absorption system. Wash the filter over the inlet side of septic tank. Replace the cleaned filter back into the outlet tee.

(h) When the tank is empty, the interior surfaces of the tank should be inspected for leaks or cracks using a strong light.

(i) A written record of any maintenance of a septic tank and absorption system should be kept by the owner of that system.

(j) The functional operation of septic tanks is not improved by the addition of yeasts, disinfectants, additives or other chemicals; therefore, use of these materials is not recommended.

(k) The advice of your regulatory authority should be sought before chemicals arising from a hobby or home industry or other unusual activities are discharged into a septic tank system.

(l) Economy in the use of water helps prevent overloading of a septic tank system that could shorten its life and necessitate expensive repairs. The plumbing fixtures in the building should be checked regularly to repair any leaks that can add substantial amounts of water to the system. Industrial wastes and other liquids that may adversely affect the operation of the onsite wastewater system should not be discharged into such a system. Paper towels, facial tissue, disinfectant wipes, newspaper, wrapping paper, disposable diapers,
sanitary napkins, coffee grounds, rags, sticks, and similar materials should also be excluded from the septic tank since they do not readily decompose and can lead to clogging of both the plumbing and the absorption system.

(2) Maintenance of Other Tanks.

(a) Other Tanks.

Any measurable amount of sludge or scum present in any other tank should be removed.

(b) If a screen is present, it should be rinsed and cleaned over the opening of the septic tank.

KEY: waste water, onsite wastewater systems, alternative onsite wastewater systems, septic tanks
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