

Section 11 – Design Criteria: Soil Treatment Area

1. General Requirements

- a. The size and design of the soil treatment area must be based on the results of the site and soil evaluation, design criteria, and construction standards for the proposed site and OWTS selected.
- b. All new soil treatment areas must receive effluent through method of a dosing siphon or pump. Gravity flow systems are not allowed in newly constructed soil treatment areas.

2. Sizing of the Soil Treatment Area

- a. The infiltrative surface of a trench or bed receiving any treatment level of effluent is only the bottom area. No sidewall credit is allowed except in deep gravel trenches and seepage pits that are permissible in repairs.
- b. Long-term acceptance rates (LTARs) are shown in Table 11-1 and 11-1A.
- c. Factors for adjusting the size of the soil treatment area are in Table 11-2 and 11-3.
- d. The required area for a soil treatment area is determined by the following formula:

$$\begin{aligned} & \textit{Soil Treatment Area in square feet required} \\ & = \frac{\textit{Design Flow (in gallons per day)}}{\textit{LTAR (in galls per day per square foot)}} \end{aligned}$$

- e. Size adjustment factors for methods of application are in Table 11-2.
- f. Size adjustment factors for types of distribution media are in Table 11-3.
- g. A required soil treatment area receiving TL1 effluent may be multiplied by one size adjustment factor from Table 11-2, Table 11-3, or both.
- h. A soil treatment area receiving TL2, TL2N, TL3, or TL3N effluent must be pressure dosed.
 - i. For products that combine distribution and higher level treatment within the same component, pressure distribution of the effluent over the soil treatment area must be used.
 - ii. TL2 – TL3N effluent may be applied by gravity flow in soil types 3, 3A, 4, 4A, or 5 for designs where reductions in the soil treatment area size or vertical/horizontal separation reductions are not being requested.
- i. The distribution media in Table 11-3 may be used for distribution of higher level treatment system effluent, but an additional reduction factor from Table 11-3 must not be used. Sizing reductions for higher level treatment systems are achieved through increased LTAR's provided in Table 11-1.

- j. If the width of a proprietary manufactured distribution product is within 90 percent of the width of the excavation, it may be approved as being equivalent to the full width of the excavation, if information is provided that demonstrates distribution over the full width. Thus, the product must cover at least 90 percent of the excavated area in either a trench or bed configuration in order to receive sizing adjustments provided in Table 11-3.

Table 11-1 Soil Treatment Area Long-term Acceptance Rates by Soil Texture, Soil Structure, Percolation Rate and Treatment Level

Soil Type, Texture, Structure and Percolation Rate Range					Long-term Acceptance Rate (LTAR); Gallons per day per square foot				
Soil Type	USDA Soil Texture	USDA Soil Structure-Type	USDA Soil Structure-Grade	Percolation Rate (MPI)	Tx Level 1 ¹	Tx Level 2 ¹	Tx Level 2N ¹	Tx Level 3 ¹	Tx Level 3N ^{1*}
R	>35% Rock (>2mm): See Table 10-1A				>35% Rock (>2mm): See Table 10-1A				
1	Sand, Loamy Sand	Single Grain	0 (Structureless)	5-15	0.80	1.40	1.40	1.55	1.55
2	Sandy Loam, Loam, Silt Loam	PR (Prismatic) BK (Blocky) GR (Granular)	2 (Moderate) 3 (Strong)	16-25	0.60	1.0	1.0	1.1	1.1
2A	Sandy Loam, Loam, Silt Loam	PR, BK, GR Massive	1 (Weak) 0 (Structureless)	26-40	0.50	0.80	0.80	0.90	0.90
3	Sandy Clay Loam, Clay Loam, Silty Clay Loam	PR, BK, GR	2, 3	41-60	0.35	0.55	0.55	0.65	0.65
3A	Sandy Clay Loam, Clay Loam, Silty Clay Loam	PR, BK, GR, Massive	1 0 (Structureless)	61-75	0.30	0.45	0.45	0.55	0.55
4	Sandy Clay, Clay, Silty Clay	PR, BK, GR	2, 3	76-90	0.20	0.30	0.30	0.30	0.30
4A	Sandy Clay, Clay, Silty Clay	PR, BK, GR Massive	1 0 (Structureless)	91-120	0.15	0.20	0.20	0.20	0.20
5	Soil Types 2-4A	Platy	1, 2, 3	121+	0.10	0.15	0.15	0.15	0.15

¹ Treatment levels are defined in Table 7-3.

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

Table 11-1A Design Criteria for Soils with High Rock Content (Type “R” Soils) ^{1,2,3,4}

Soil Type, Percentage of Rock, LTAR, Distribution				Required Sand or Media Depth Relative to the Quality of Effluent Applied to the Distribution System				
Soil Type	Percentage and Size of Rock ⁵	Maximum LTAR (Gal./sq.ft./ day)	Type of Distribution Required	Treatment Level 1 ⁶	Treatment Level 2	Treatment Level 2N	Treatment Level 3	Treatment Level 3N
R-0	Soil Type ⁷ 1 with more than 35% Rock (>2mm)	Unlined Sand Filter: 1.0 for “Preferred Sand Media”; 0.8 for “Secondary Sand Media”	Pressure Distribution ⁸	Minimum 3-foot deep Unlined Sand Filter	Minimum 3-foot deep Unlined Sand Filter	Minimum 2.5-foot deep Unlined Sand Filter	Minimum 2.5-foot deep Unlined Sand Filter	Minimum 2-foot deep Unlined Sand Filter
R-1; Option 1	Soil Type ⁷ 2 – 5, >35 - 65% Rock (>2mm) ; with ≥50% of the Rock <20 mm (3/4 inch)	Use TL1 LTAR from Table 10-1 for the soil type corresponding to the soil matrix, with a maximum LTAR of 0.8	Pressure Distribution ⁸	Minimum 2-foot deep Unlined Sand Filter	Minimum 1-foot deep Unlined Sand Filter	Minimum 1-foot deep Unlined Sand Filter	Sand media not required	Sand media not required
R-1; Option 2	Soil Type ⁷ 2 and 2A, >35 - 65% Rock (>2mm); with ≥50% of the Rock <20 mm (3/4 inch)	The allowable LTAR’s are defined in each individual treatment level column in this Table	Pressure Distribution ⁸	Remove, mix, replace 4 feet of existing material; with a maximum LTAR of 0.6	Remove, mix, replace 2 feet of existing material; with a maximum LTAR of 0.7	Remove, mix, replace 2 feet of existing material; with a maximum LTAR of 0.7	Remove, mix, replace 2 feet of existing material; with a maximum LTAR of 0.8	Remove, mix, replace 2 feet of existing material; with a maximum LTAR of 0.8
R-2	Soil Type ⁷ 2 – 5, >65 Rock (>2mm), OR ≥50% of Rock >20 mm (3/4 inch)	Use TL1 LTAR from Table 10-1 for the soil type corresponding to the soil matrix, with a maximum LTAR of 0.8	Timed, Pressure Distribution ⁸	Minimum 3-foot deep Unlined sand filter	Minimum 3-foot deep Unlined Sand Filter	Minimum 2.5-foot deep Unlined Sand Filter	Minimum 2.5-foot deep Unlined Sand Filter	Minimum 2-foot deep Unlined Sand Filter

- 1 General guidance for Table 10-1A: The intent of the soil type R-0 is to define a material that consists of a high percentage of rock, or rock fragments, and has a percolation rate of less than 5 mpi. Soil types R-1 and R-2 consist of a high percentage of rock or rock fragments, but have a percolation rate of greater than 5 mpi. Soil types R-0 and R-2 are considered to be a “limiting layer”.
- 2 No sizing adjustments are allowed for systems placed in type “R” soils. The maximum LTAR’s are provided in this table.
- 3 The design of type “R” soil treatment systems must conform to sections 12.3.b and c
- 4 All systems installed in a type “R” soil must be designed by a professional engineer.
- 5 The percentage of rock may be determined by a gradation conducted per ASTM standards, or an appropriate field evaluation by volume.
- 6 Type “R” soil treatment systems that are designed per the criteria noted in the Treatment Level 1 column of this table do not require O/M oversight by the LPHA.
- 7 The “Percentage and Size of Rock” column references the soil types noted in Table 11-1.
- 8 Design of the pressure distribution system for type “R” soils shall comply with the requirements of sections 12.3.b.ii, iii, v,vii,viii.

3. Allowable Soil Treatment Area Sizing Adjustments:

- a. The soil treatment area size determined by dividing the design flow rate by the long-term acceptance rate may be adjusted by factors for method of treatment, soil treatment area design, and type of distribution media.
- b. For the purpose of the table, a "baseline system," i.e. adjustment factor of 1.00, is considered to be Treatment Level 1 (TL1) applied by gravity to a gravel-filled trench.
- c. Sizing adjustments for use of the higher level treatment categories listed in Table 11-1 will only apply provided the system is inspected and maintained as specified in the requirements of Section 16, Operating Permits.

Table 11-2 Size Adjustment Factors for Methods of Application in Soil Treatment Areas Accepting Treatment Levels 1, 2, 2N, 3 and 3N Effluent

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

Table 11-3 Size Adjustment Factors for Types of Distribution Media in Soil Treatment Areas for Treatment Level 1 Systems

Type of Soil Treatment Area	Type of Distribution Media Used in Soil Treatment Area ¹		
	Category 1	Category 2	Category 3
	Rock or Tire Chips	Other Manufactured Media	Chambers or Enhanced Manufactured Media
Trench or Bed	1.0	0.9	0.7

1. All proprietary distribution products must receive acceptance and the applicable reduction through Division review per the applicable requirements of section 43.13 of Regulation #43.

4. Design of Distribution Systems

- a. General
 - i. The infiltrative surface and distribution laterals must be level.

- ii. The infiltrative surface must be no deeper than four feet below grade unless TL2N or higher effluent is applied to the distribution media and the system is inspected and maintained as specified in the requirements of Section 16. The depth of the infiltrative surface will be measured on the up-slope side of the trench or bed.
- iii. Trenches must follow the ground surface contours so variations in infiltrative surface depth are minimized. Beds must be oriented along contours to the degree possible.
- iv. Pipe for gravity distribution must be no less than three inches in diameter.
- v. A final cover of soil suitable for vegetation at least ten inches deep must be placed from the top of the geotextile or similar pervious material in a rock and pipe system, chamber, or manufactured media up to the final surface grade of the soil treatment area.
- vi. Following construction, the ground surface must be graded to divert stormwater runoff or other outside water from the soil treatment area. The area must be protected against erosion. Subsurface drains upslope of the soil treatment area may be installed to divert subsurface flow around the area.
- vii. Backfilling and compaction of soil treatment areas must be accomplished in a manner that does not impair the intended function and performance of the storage/distribution media and soil and distribution laterals, allows for the establishment of vegetative cover, minimizes settlement and maintains proper drainage.
- viii. Dosing may be used for soil treatment area distribution. The dose must be sized to account for the daily flow and the dosing frequency.
- ix. If the natural grade at or within 35 feet of the soil treatment area is greater than 30 percent, then following is required:
 1. A 30 mil PVC liner shall be placed on each end and on the down slope side of the absorption system excavation in a manner such that all exposed soils are covered;
 2. A berm shall be constructed in accordance with the Clear Creek County Best Management Practice Manual upslope of the absorption system to divert surface water run-off from the absorption system.

b. Distribution Laterals

- i. Distribution between laterals in a soil treatment area must be as level as possible. Uneven settling of portions of the distribution system following construction must be addressed by provisions in the design to adjust flows between laterals.
- ii. Distribution laterals receiving a gravity fed flow may not be longer than 100 feet.

- iii. Distribution laterals receiving a pressure dosed effluent or effluent applied to the center of the laterals or chambers may not be longer than 150 feet.
- iv. For absorption beds, the separating distance between parallel gravity distribution laterals must not exceed six feet (center-to-center), and a distribution lateral must be located within three feet of each sidewall and endwall.
- v. The end of a distribution pipe must be capped, unless it is in a bed or trenches in a level soil treatment area, where the ends of the pipes may be looped.
- vi. To promote equal distribution to the soil treatment area, the forcemain or effluent pipe must be connected to as near to the middle of the distribution header as possible. However it must be offset from any distribution lateral to prevent preferential flow.
- vii. Orifices must be oriented downward unless pressure distribution is used and provision for pipe drainage is included.

c. Pressure Distribution

- i. The design of a pressure distribution system must include:
 - 1. Dose size and frequency for either proposed flows and soil type, or media long-term acceptance rate;
 - 2. Pipe diameter and strength requirements;
 - 3. Orifice size and spacing;
 - 4. A 30 – 72 inch operating head at the distal end orifice;
 - 5. Pump/siphon information; Total Dynamic Head; gallons/minute;
 - 6. Drain-back volume from forcemain; and
 - 7. Calculations, or a design software reference, that indicates the selected component sizing will provide equal flow within each active zone of the distribution system, and provide no more than a 10% flow differential from the initial orifice to the most distal end orifice within each zone.
- ii. The separating distance between parallel distribution pipes in a pressure distribution absorption bed must not exceed four feet, and the outer distribution pipe must be located within two feet of each sidewall and endwall. Specific requirements for the design of sand filters are noted in Section 12.3.b
- iii. Flushing assemblies must be installed at the distal end of each lateral and be accessible from finished grade. A sweeping 90 degree or bends limited to 45 degree must be provided.
- iv. The Department requires that all effluent be screened prior to discharging to a pressure distribution system. This may be accomplished by an effluent screen in

the septic tank or pump chamber, or a filter placed on the discharge pipe from the pump or siphon.

5. Soil Treatment Area Requirements

a. Trenches

- i. Trenches must be three feet wide or less.
- ii. The separating distance between trenches must be a minimum of four feet sidewall-to-sidewall.
- iii. Distribution laterals used in a trench must be as close to the center of the trench as possible.

b. Beds

- i. Maximum width for a bed must be 12 feet, unless the bed receives effluent meeting Treatment Level 2 quality or better.
- ii. The separating distance between beds must be a minimum of six feet sidewall-to-sidewall.

c. Serial and Sequential Distribution:

- i. A serial or sequential distribution system may be used where the ground slope does not allow for suitable installation of a single level soil treatment area unless a distribution box or dosing chamber is used.
- ii. The horizontal distance from the side of the absorption system to the surface of the ground on a slope must be adequate to prevent lateral flow and surfacing.
- iii. Adjacent trenches or beds must be connected with a stepdown/relief pipe or a drop box arrangement such that each trench fills with effluent to the top of the gravel or chamber outlet before flowing to succeeding treatment areas.

b. Alternating Systems

- i. An alternating system must have two or more zones that must be alternated on an annual or more frequent basis.
- ii. For repairs, each section must be a minimum of 50 percent of the total required soil treatment area. For new installations, each separate soil treatment area must meet the minimum sizing requirements of this regulation.
- iii. A diversion valve or other approved diversion mechanism that requires the owner or operator to manually alternate zones of the OWTS may be installed on the septic tank effluent line allowing soil treatment area sections to be alternated.
- iv. The diversion mechanism must be readily accessible from the finished grade.

c. Sequencing Zone Systems

- i. Sequencing zone systems have two or more soil treatment area sections that are dosed on a frequent rotating basis.
- ii. Where soil conditions are similar between the sections, each section area must be the same size. If soil conditions are such that long-term acceptance rates are different, each section may be sized for the same dose, but different long-term acceptance rates.
- iii. An automatic distribution valve must be used.
- iv. Dosing of each system must be evaluated by the design engineer based on projected daily flow rates, number of zones, and soil types.

d. Inspection Ports

- i. A 4-inch inspection port accessible from ground surface must be installed at the terminal end of each lateral in a trench system and at each corner of a bed system. The bottom of the inspection port tube must extend to the infiltrative surface and not be connected to the end of a distribution pipe.
- ii. Inspection ports in chambers must be installed according to manufacturer's instructions if the infiltrative surface is visible and effluent levels can be observed from the inspection port
- iii. Additional inspection ports connected to distribution pipes may be required.
- iv. The Department may require an inspection port at the initial end of each lateral in a trench system.
- v. The top of inspection ports may be terminated below the final grade if each is housed in a component such as a valve box for a lawn irrigation system and has a removable cover at the ground surface.

6. Storage/Distribution Media

a. Rock and Pipe

- i. The perforated pipe must be surrounded by clean, graded gravel, rock, or other material of equal efficiency which may range in size from 1/2 inch to 2 1/2 inches. AASHTO M 43 size No. 3 coarse aggregate meets this specification.
- ii. At least six inches of gravel, rock or other material must be placed below the pipe. The gravel, rock or other material must fill around the pipe and be at least two inches above the top of the distribution pipe.
- iii. The top of the placed gravel or such material used must be covered with non-woven permeable geotextile meeting a maximum thickness rating of 2.0 ounces per square yard or equivalent pervious material. An impervious covering must not be used.

b. Chambers

- i. Chambers must be installed with the base of the unit on in-situ soil or, if placed on acceptable media, the manufacturer's installation instructions must be followed so as to prevent chambers from settling into the media.
- ii. Installation must be according to manufacturer's instructions.
- iii. Effluent may be distributed by pump or siphon.

c. Media, Enhanced, or Other Manufactured

- i. Manufactured media must be installed with the base on the in-situ soil or placed on acceptable media meeting the manufacturer's specifications for proprietary distribution products or combined treatment/distribution products.
- ii. Installation must be according to manufacturer's instructions.
- iii. Pressure distribution is required for TL2-TL3N effluent, unless otherwise noted in this regulation.

d. Driplines

- i. The infiltrative surface area must be calculated using the long-term acceptance rate for the site or a more conservative value if recommended by the manufacturer.
- ii. Driplines must be installed on manufacturer's spacing recommendations.
- iii. Drainback must be provided for all drip lines, pipes and pumps.
- iv. Provisions must be made to minimize freezing in the distribution pipes, driplines, relief valves, and control systems.
- v. Provisions must be made for filtering, back-flushing, or other cleaning.

e. Tire Chips

- i. The pipe may be surrounded with clean, uniformly-sized tire chips.
- ii. Tire chips must be nominally two inches in size and may range from 1/2 inch to a maximum of four inches in any one direction.
- iii. Wire strands must not protrude from the tire chips more than 0.75 inches.
- iv. Tire chips must be free from balls of wire and fine particles less than two mm across.
- v. The top of the tire chips used must be covered with non-woven permeable geotextile meeting a maximum thickness rating of 2.0 ounces per square yard or equivalent pervious material. An impervious covering must not be used.

7. Soil Replacement Systems

- a. The construction of a soil replacement system is permitted to bring the soil treatment area into compliance with the requirements of this regulation.
- b. When a soil type “R” is removed, the following requirements must be met:
 - i. All added soil must comply with the following specifications:
 1. Added soil must meet the specifications of either “preferred” or “secondary” sand filter media, as specified in section 12.3.b
 2. The long-term applicable rates as specified in Table 11-1A must be used. No additional sizing adjustments are allowed.
 3. The depth of the added media must comply with the requirements of Table 11-1A.
 - a. In order to utilize the reduced vertical separation requirements for TL2N, 3 or TL3N quality effluent, an Operating Permit is required as specified in Section 16.
 4. A gradation of the sand media used must be provided. The gradation must be dated no more than one month prior to the installation date. However, a gradation of the actual material placed in the excavation is recommended.
 5. All added soil must be completely settled prior to installation of components as specified and approved by the design engineer.
 6. Pressure distribution must be used.
 - c. The removal and reinstallation of in-situ soil may only be allowed where the soils are determined to be a soil type “R-1” (Option 2). The design must comply with the requirements for this soil type noted in Table 11-1A (Soil Type R-1, Option 2).
 - d. When a sand media is added to soil treatment area or to an excavation where a soil type 1-5 (Table 11-1) is the underlying soil, the following requirements must be met:
 - i. Added soil must meet the specifications of either “preferred” or “secondary” sand filter media, as specified in section 12.3.b
 - ii. Unless the design follows the criteria for a sand filter or mound system design as required in Section 12 the TL1 long-term acceptance rate for the receiving soil must be used.
 - iii. A gradation of the sand media used must be provided. The gradation must be dated no more than one month prior to the installation date. However, a gradation of the actual material placed in the excavation is recommended.
 - iv. All added soil must be completely settled prior to installation of components.

8. Repairs

- a. When space is not available or if there are other site limitations that preclude other soil treatment area options for OWTS repairs- wide beds, deep gravel trenches, deep beds and seepage pits may be considered for repairs only. Other options are vaults or higher level treatment systems.
- b. Repairs to failing systems must conform to setbacks identified in 8-1 when possible. When this is not possible using all available methods described in this regulation, the Department may permit reductions to setbacks.
 - i. At no point will a setback reduction be approved by the Department less than what the existing separation is to existing OWTS. In maximizing this setback distance, all methods available in Section 11.8.a must be utilized including but not limited to the use of Higher Level Treatment, wide beds, seepage pits, etc., where allowed.
 - ii. Any setback reduction beyond what the existing failing system presents must be approved by the Clear Creek County Board of Health as outlined in Section 20.
- c. Wide Beds
 - i. For repairs, beds may be wider than 12 feet without being required to receive effluent meeting Treatment Level 2N quality or better.
- d. Deep Beds
 - i. For repairs, the infiltrative surface of a bed may be no deeper than five feet.
 - ii. Size adjustments as provided for in Table 11-2 and 11-3 must not be applied. System sizing will be based strictly on the soil type and corresponding LTAR.
- e. Deep Gravel Trenches
 - i. The length of an absorption trench may be calculated by allowance for the sidewall area of additional depth of gravel in excess of six inches below the bottom of the distribution pipe according to the following formula:

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

- ii. Where:
 - 1. L = length of trench prior to adjustment for deep gravel
 - 2. W = width of trench in feet
 - 3. D = additional depth in feet of gravel in excess of the minimum required six inches of gravel below the distribution pipe
- iii. Maximum allowable additional depth is five feet.

- iv. Percolation tests or soil profile test pit excavations must be performed at the proposed infiltrative surface depth.
- v. Size adjustments as provided for in Table 11-2 and Table 11-3 must not be applied to deep gravel trenches.

f. Seepage Pits

- i. Seepage pits for new construction are prohibited.
- ii. For repairs, potential for risk to public health and water quality may be evaluated by the. If risk is low in the determination, a seepage pit without higher level treatment may be used.
- iii. If the risks are not low, higher level treatment of at least TL2N must be attained prior to discharge to these systems for final dispersal.
- iv. A seepage pit must consist of a buried structure of precast perforated concrete, or cinder or concrete block laid dry with open joints.
 - 1. Pits must be provided with both vertical sidewall and top supporting structural concrete or other material of equal structural integrity.
 - 2. The excavation must be larger than the structure by at least 12 inches on each side and may not exceed 5 feet beyond the structure wall.
 - 3. The over-excavated volume must be filled with clean, graded gravel or rock, which may range in size from ½ inch to 2 ½ inches. AASHTO M 43 size No 3 coarse aggregate meets this specification.
 - 4. The capacity of the pit must be computed on the basis of long-term acceptance rates determined for each stratum penetrated. The weighted average of the results must be used to obtain a design figure.
 - 5. Soil strata in which the percolation is slower than 30 minutes per inch must not be used for absorption or seepage. These strata must not be included in the weighted average to determine the long-term acceptance rate.
 - 6. The infiltrative surface of the pit is the vertical wall area (based on dug perimeter) of the pervious strata below the inlet plus the bottom of the excavated area.
 - 7. The bottom of the pit excavation must be greater than four feet above a limiting layer.
- v. Pits must be separated by a distance equal to three times the greatest lateral dimension of the largest pit. For pits over 20 feet in depth, the minimum space between pits must be 20 feet.

g. Wastewater Ponds

- i. Construction of new wastewater ponds is prohibited.
- ii. For repairs of an existing wastewater pond, the potential for risk to public health and water quality may be evaluated by the Department. If risk is low in the determination, the repair of a wastewater pond may be permitted, however the following criteria must be followed:
 1. A septic tank must precede the wastewater pond.
 2. The depth of the design volume of the wastewater pond must be at least five feet.
 3. A wastewater pond must have two feet of free board above the design volume of the pond.
 4. A wastewater pond must be fenced to keep out livestock, pets, vermin, and unauthorized people.
 5. Wastewater ponds must be designed on the basis of monthly water balance including design flow, precipitation, evaporation, and seepage.
 6. Wastewater ponds must be constructed so the seepage out of the bottom or sides does not exceed 1/32 of an inch per day. If this limit cannot be achieved using compacted natural soil materials including soil additives, an impermeable synthetic membrane liner must be used.
 7. If the evapotranspiration does not exceed the rate of inflow of effluent from the structure, a soil treatment area meeting the requirements of this regulation must be installed to accept the excess flow.
 8. Maintenance must include preventing aquatic and wetland plants from growing in or on the edge of the pond, protecting sides from erosion, and mowing grasses on the berm and around the pond.

h. Vaults

- i. Criteria for vaults are in Section 13 of this regulation.

i. Higher Level Treatment Options

- i. Reduction in required soil treatment area size for repairs is possible with higher level treatment.

j. Remediation Systems

- i. The intent of a remediation technology or process is to sufficiently increase the infiltration rate through the infiltrative surface at the bottom of an existing trench or bed and restore permeability to the soil below. Treatment levels as defined in Table 7-3 are not granted to remediation technologies.

- ii. The Department may permit the use of remediation technologies or processes to address an existing failure or malfunction within a soil treatment area.
- iii. The use of a remediation technology or process constitutes an alteration to the OWTS, and therefore the owner must obtain a permit for this work.
- iv. Upon approval of the Department, a system owner may choose to try a remediation technology or process to see if an existing problem with the soil treatment area will be resolved. The system owner bears the risk and cost of this attempt and is aware that an additional repair may be required.
- v. Remediation technologies and processes must not adversely affect groundwater, surface water, any existing components, the long-term effectiveness of the soil treatment area, or the environment.
- vi. If the remediation technology or process does not correct the problem with the system, a conforming OWTS must be installed per the requirements in this regulation within a time frame determined by the Department.
- vii. Monitoring and/or maintenance of the remediation technology or process as a stipulation of permit issuance.