Manual - Part 3 - System Requirements

Part Three: System Requirements

Chapter 1. General Requirements

These general requirements apply to all onsite wastewater systems, unless otherwise specified within this Manual.

A. Wastewater Strength

1. Domestic strength wastewater, for the purpose of this Manual, is wastewater with the following characteristics:
   a. Total suspended solids less than or equal to 300 ppm
   b. Five-day Biochemical Oxygen Demand less than 300 ppm
   c. Total Nitrogen as Nitrogen less than or equal to 75 ppm
   d. Grease and oil less than 100 ppm
2. Unless otherwise demonstrated by a Certified Designer, recreational vehicle holding tank wastes, when discharged in a concentrated and undiluted volume, such as at a commercial RV dump station, shall be considered high strength waste.
3. Wastewater from non-residential sources or high strength wastewater from residential sources must receive pretreatment sufficient to lower the waste strength to the level of that commonly found in domestic residential septic tank effluent before discharge into a standard gravity or supplemental treatment wastewater system.
4. The Central Valley Regional Water Quality Control Board will be notified by the LEA whenever the LEA approves a pretreatment system or methodology for high strength wastewater.

B. Table 1 provides application rate requirements based on the USDA soil texture classification system. Soil textural classification should be considered the primary data source for system sizing.

C. Seasonal groundwater monitoring will be required by the LEA for on-site wastewater systems with a design flow of 1,500 gpd or greater whenever soil coloration (redoximorphic features) indicates the seasonal groundwater level may be elevated to within six inches of the required vertical separation, or where other factors, including but not limited to soil maps, historical observations, vegetation, or topography indicate that elevated seasonal groundwater may be present. For on-site wastewater systems with a design flow of less than 1,500 gpd, seasonal groundwater monitoring may be required by the LEA for the conditions described above. Further information about seasonal groundwater monitoring is found in Part 1 of this Manual.

D. Figure 1 provides application rates based on percolation test results. Percolation testing should be considered a source of supplemental information for system sizing.

E. Soils that percolate at a rate of 1-5 mpi require pressure distribution and are not to be permitted by the LEA unless there is demonstration of adequate filtration capacity by utilizing design features including, but not limited to:

1. Use of supplemental treatment systems, including the single-pass sand filter;
2. Use of pressure distribution or subsurface drip irrigation for dispersal;
3. Reduction in application rate of wastewater to the dispersal field, beyond that which is specified in the Manual;
4. Increase in vertical separation, beyond that which is specified in the Manual; and
5. Increase in horizontal setback distances to wells and/or surface water to that which is specified in this Manual.

F. When sizing by soil group and more than one soil group is encountered within a soil profile, drainfield trench sizing must be based on the most restrictive soil group encountered within 36 inches from the bottom of the drainfield trench for on-site wastewater systems with a design flow of 1,500 gpd or greater. For on-site wastewater systems with a design flow of less than 1,500 gpd, drainfield trench sizing must be based on the most restrictive soil group encountered within 18 inches from the bottom of the drainfield trench.

G. When calculating the required lineal feet of the dispersal field, only the trench bottom area may be considered.

H. The LEA may allow up to a 25% reduction in drainfield sizing based on inclusion of a portion of the trench sidewall area for determining absorptive area when pressurized distribution is utilized. The percent of reduction would be based on the formula used in the Manual of Septic Tank Practice. An additional 25% reduction in drainfield sizing may be allowed when supplemental treatment is utilized. The combined reduction shall be no more than 50%. The base from which the reduction would be made is the size of the system calculated from trench bottom only utilizing the application rates associated with soil classifications in Table One in this Chapter.

I. Reserve Area. A reserve area with suitable site conditions for a new dispersal system installation must be set aside. The reserve area must be:

1. Equal to 100 percent of the capacity required for a replacement dispersal system
2. Totally separate from the initial dispersal system area,

3. Able to meet all current design requirements for the type of replacement system proposed, including soil depth, soil type, slope restrictions, and setbacks, etc.
4. Fully protected to prevent damage to soil and any adverse impact on the immediate surroundings that may affect the installation of the replacement dispersal system or its function

J. Systems must be designed to disperse effluent to subsurface soils in a manner that provides unsaturated zone treatment and aerobic decomposition of the effluent. The base of the dispersal system must be designed and installed at the shallowest practicable depth at or below the original elevation of the soil surface to maximize elements critical to effective treatment of effluent in the soil. Elements critical to effective treatment include oxygen transfer, biological treatment, and vegetative uptake of nutrients.

K. The minimum liquid capacity of any septic tank installed must be 1500 gallons for up to a 4 bedroom residence and an additional 200 gallons for each bedroom thereafter.

L. Where the site evaluation reveals the probable existence of slope instabilities within 50 feet of the primary or repair dispersal field areas, the LEA will require a Professional Engineer or Registered Civil Engineer inspect the site and recommend mitigation measures to prevent slope instabilities form impacting the on-site wastewater system. Such measures may include, but are not limited to, the following:

1. Altering the proposed system location to avoid steep slopes and/or slope instabilities;
2. Establishing specified recommended setbacks from identified slope instabilities or from steep slopes; and
3. Incorporating wastewater system design measures to minimize the creation of localized saturated flow conditions, such as pressure distribution or subsurface drip irrigation instead of gravity flow.

M. For on-site wastewater systems with design flows exceeding 1,500 gallons per day, the LEA will require the certified designer to include a special design analysis and design features to assure the prevention of localized impacts to water quality or public health. The analysis and design features must include:

1. Analysis of the potential localized waste loading effects including, at a minimum, groundwater mounding and nitrogen loading;
2. Minimum criteria for evaluation of the results of the analysis; and
3. Incorporation of the system design measures to address the findings of the analysis.

N. For on-site wastewater systems located within a 100-year flood zone, the LEA will require the certified designer to include a special design analysis and design features to prevent caused by inundation with water. The analysis and design features must include includes:

1. Protection of supplemental treatment, pressure distribution, and subsurface drip irrigation components; and
2. Prevention of discharge of wastewater into flooded dispersal areas from pumps or dosing siphons where the distribution piping is less than 12 inches below ground surface.

Table 1. Soil Depth and Application Rate Requirements

Soil Group	USDA Textural Classification	Structure	Application Rate (gpd/ft^2)
A[1]	Course to medium sand	N/A	1.2
B[2]	Fine sand	Weak to strong	1.2
		Massive	0.7
	Loamy sand	Moderate to strong	0.9
		Massive or weak	0.6
C	Sandy loam	Moderate to strong	0.9
		Weak, weak platy	0.6
		Massive	0.5
	Loam	Moderate to strong	0.8
		Weak, weak platy	0.6
		Massive	0.5
D	Silt loam	Moderate to strong	0.8
		Weak, weak platy	0.3
		Massive	0.2
E[3]	Sandy clay loam	Moderate to strong	0.6
		Weak, weak platy	0.3
		Massive	See Footnote [4]
	Clay loam	Moderate to strong	0.6
		Weak, weak platy	0.3
		Massive	See Footnote [4]

[1] Percolation test required for course sand and use prohibited if percolation is faster than 1 minute per inch

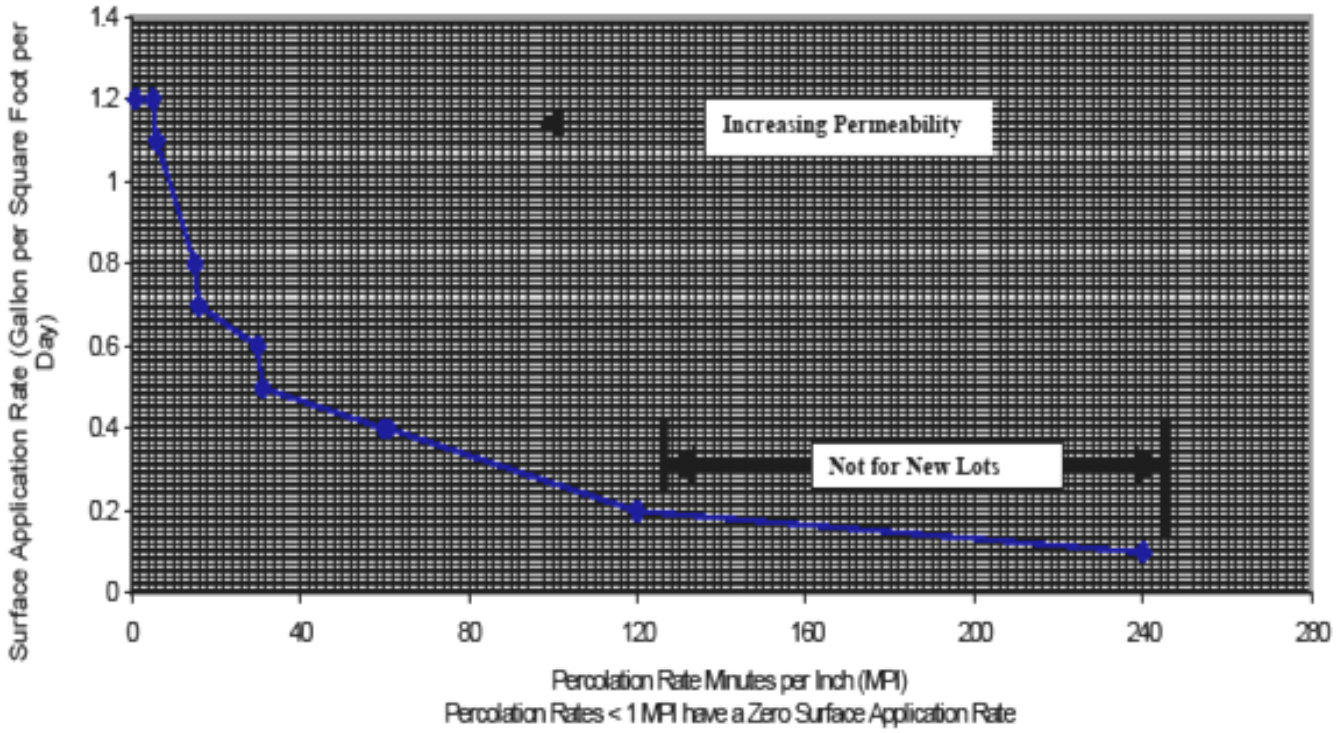
[2] Subject to percolation test in addition to soil textural determination if 35% or more (by volume) coarse fragments (defined as > 2 mm size)

[3] Clay must be non-expansive

[4] Not acceptable for on-site wastewater dispersal unless adequate percolation rate verified and on-site wastewater system designed by a Certified Designer

Soil Group	USDA Textural Classification	Structure	Application Rate (gpd/ft^2)
	Silty clay loam	Moderate to strong	0.6
		Weak, weak platy	0.3
		Massive	See Footnote [4]
	Sandy clay	Moderate to strong	0.3
		Massive to weak	See Footnote [4]

Figure 1: Design Infiltrative Surface Application Rates



Note: Application rates with a percolation rates higher than 120 are restricted to existing parcels.

Chapter 2. Location and Setbacks

The horizontal setbacks[5] shown in the following table will apply to all on-site wastewater systems unless otherwise specified in this Manual.

Distance Required From:	From Drainfield	From Septic Tank, ATU, or Lined Sand Filter
Wells[6]		
Public well[7]	150’	150’
Private well	100’	50’
Other wells, excluding monitoring wells	100’	50’
Surface waters[2]		
Reservoirs or lakes (downslope from wastewater system components)	200'	50’
Reservoirs or lakes (upslope from wastewater system components	100’	50’
Year-Round Springs, Streams, Creeks, or Ponds	100’	50’
Intermittent streams, drainage swales	50’	50’
Curtain drains--Vertical/Curtain drains		
Up gradient of system	20’	20’
Down gradient of system	50’	25'
Cuts manmade in excess of 2.5 feet (top of down slope cut) or escarpments[8]	4 X height[4]of the bank, to a maximum of 50'	20’
Property lines, foundation lines of any structure including garages, out-buildings, in-ground swim pools, water lines[9.10]	5’	5’
Easements[11]		
Public access easement	20’	20’
Other easement	Clear	Clear

[5] If a setback is not specified in this table, the most recent Board of Supervisors-adopted California Plumbing Code setback will be applied

[6] Additional setback may be required from dispersal field for community or larger wastewater systems

[7] The 150’ setback is increased to 200’ if the dispersal system exceeds 10’ in depth. Where the dispersal system is within 600 feet of a public water well and exceeds 20 feet in depth the horizontal setback required to achieve a two-year travel time for microbiological contaminants shall be evaluated. A qualified professional shall conduct this evaluation. However in no case shall the setback be less than 200 feet. Where the effluent dispersal system is within 1,200 feet from a public water systems’ surface water intake point, within the catchment of the drainage, and located such that it may impact water quality at the intake point such as upstream of the intake point for flowing water bodies, the dispersal system shall be no less than 400 feet from the high water mark of the reservoir, lake or flowing water body. Where the effluent dispersal system is located more than 1,200 feet but less than 2,500 feet from a public water systems’ surface water intake point, within the catchment area of the drainage, and located such that it may impact water quality at the intake point such as upstream of the intake point for flowing water bodies, the dispersal system shall be no less than 200 feet from the high water mark of the reservoir, lake or flowing water body.

[8] The height (in feet) of the cut or escarpment as measured from the toe of the cut or vertically to the projection of the natural ground slope.

[9] The LEA encourages the placement of septic tanks and other treatment units as close as feasible to the minimum separation from the building foundation in order to minimize possible clogging of the building sewer.

[10] Unless otherwise approved by the LEA, crossing of water lines and effluent sewer lines is prohibited.

[11] A system may be installed underneath overhead power lines or cross other utilities (e.g., canals) providing all of the following conditions are met:

a. Written authorization is received from the utility company operating and maintaining the utility affected or for which the easement or restriction was granted;

b. The LEA determines that the encroachment is necessary and there is no other viable area in which to install the system; and

c. All construction modifications required by the LEA and the affected utility company (is) are instituted to carry out the purposes of this Manual.

Chapter 3. Design Flow

A. Projected daily sewage flow from single family residences must be calculated at 240 gpd for 2 bedrooms, 360 gpd for 3 bedrooms, and 60 gpd for each additional bedroom.

B. Projected daily flows for other than single-family dwellings shall be estimated using the following table unless, on a case-by-case basis, the LEA approves metered water use data, or other supporting data in lieu of the estimated sewage flows set forth in the table. However, in no case shall a system be designed for a flow of less than 100 gpd. Existing data may be used, provided the following specifications are met:

1. The design flow may be calculated by actual potable water meter readings, or facility wastewater influent or effluent meter readings if water records are from billing records of the service provider or from water meters certified to be within 2% by the water purveyor or, in the case of wastewater metering, the meter read values are certified as "correct" by a certified designer.
2. The average daily flows shall be adjusted for peak flow days as follows:
   a. If the water meter records are recorded on a daily basis, the highest ten day flows can be averaged and used for the design flow.
   b. If the water meter records are recorded on a weekly basis, the design flow shall be calculated by dividing the number of days the facility was in use into the highest weekly flow, and multiplying by 1.2
   c. If the water meter records are recorded on a monthly basis, the design flow shall be calculated by dividing the number of days the facility was in use into the highest monthly flow, and multiplying by 1.5.
   d. If the water meter records are recorded on a quarterly basis, the design flow shall be calculated by dividing the number of days the facility was in use into the highest quarterly flow and multiplying by 2.0.

Design Flows

Type of Business or Facility	Minimum Flow (Gallons/ Day)
Bathhouses and swimming pools	10 (per person)
Barbershop/salon	100 (per chair)
Camps (4 persons per campsite, where applicable)	
-with central comfort stations	35 (per person)
-with flush toilets, no showers	25 (per person)
-construction camps (semi-permanent)	50 (per person)
-day camps (no meals served)	15 (per person)
-resort camps (night and day) with limited plumbing	50 (per person)

Type of Business or Facility	Minimum Flow (Gallons/ Day)
Churches	
-with kitchen	15 (per seat)
-without kitchen	5 (per seat)
Country clubs	
-per resident member	100
-add per nonresident member present	25
-add per employee	15 (per 8 hour shift)
Department store with public bathrooms	400
Dentist office	
-per wet chair	200
-add per non-wet chair	50
Factories	
-with shower facilities, no food service or industrial wastes	35 (per person, per shift)
-without shower facilities, no food, service or industrial wastes	15 (per person, per shift)
Hospitals	250 (per bed space)
Hotels or motels	
-with private baths	100 (per room)
-without private baths	80 (per room)
Institutions other than hospitals	125 (per bed)
Laundries, self-service washing machines	500 (per machine)
Limited agricultural building	100 (per building)
Mobile home parks	250 (per space)
Parks, public picnic areas	
-with toilet wastes only	5 (per person)
-with bathhouses, showers and flush toilets	10 (per person)
Restaurants	
-with multi-use utensils	50 (per seat)
-with single service utensils	25 (per seat)
-with bars and/or cocktail lounges	50 (per seat)
Residential Structures	
-Second dwelling, condominium, multi-family (duplex, triplex, etc.)	-Same as for full single family residence
-Guesthouse	-Same a for additional bedroom
Retail stores	
-for customer	-Use comparable flows from similar businesses and population
-add for each employee	15 (per 8-hr shift)
Shopping center	2 (per parking space)
Schools	
-boarding	100 (per person)
-day (without gyms, cafeterias or showers)	15 (per person)
-day (with gyms, cafeterias and showers)	25 (per person)
-day (with cafeteria, no gym or showers)	20 (per person)
Service stations	500 for 1st pump set, 300 for each addn'l
Swimming pools and bathhouses	10 (per person)
Theaters	
-movie	5 (per seat)
-drive-in	20 (per car space)
Recreational vehicle parks	
-without individual water and sewer hookups	50 (per space)
-with individual water sewer hookups	100 (per space)

Chapter 4. Installation

A. Septic tanks must be installed on a level, stable base of either pea-gravel or sand.

B. Septic tanks located in high groundwater areas must be accompanied with engineered anti-buoyancy calculations to prevent flotation.

C. All septic tanks must be installed with watertight risers extending to finished grade, with surrounding grading to facilitate drainage away from the riser.

D. Septic tanks must be installed in a location that provides access for servicing and pumping.

E. Systems will not be installed when moist or wet conditions cause trench sidewall or bottom area degradation of soil structure and porosity (which frequently appears as smearing and compaction).

F. Each drainfield trench will have distribution piping that is centered horizontally in the trench.

G. Drainfield trenches must be installed on contour.

H. Prior to backfilling the trench, the drain rock must be covered with filter fabric, a minimum of 2 inches of compacted straw or with untreated building paper.

I. Backfill must be carefully placed to prevent damage to the system.

J. Backfill must be native soil free of large stones, frozen clumps of earth, masonry, stumps, waste construction materials, or other materials that could damage the system.

K. All distribution boxes must be bedded on level pea gravel or sand base.

L. Observation ports, of a design approved by the LEA, must be installed at the end of each drainfield trench.

M. Adequate erosion control measures must be utilized at all times in conformance with applicable county regulations and per the consultant's design.

N. Slope of Lines

1. Tightline From House

   Maintain 1/8 to 1/4 inch drop per running foot (1% to 2% slope). Use two 45 degree fittings and a cleanout when a step-down is necessary. Locate step-down as close to house and as far from septic tank as possible to avoid unnecessary turbulence in septic tank.

2. Tightline From Septic Tank

   Maintain minimum of 6 inch drop per 100 feet (0.5% slope) to perforated drain lateral.

3. Perforated Lateral

   Level each lateral; maximum allowed tolerance will be ± 1 inch. Place an end cap on each lateral. Rotate each section of lateral pipe so holes are at 5:00 and 7:00 position

O. Whenever a trench excavation could act as a conduit for groundwater movement between system components, the trench must be back-filled with a minimum of 5 lineal feet of sufficiently restrictive material, such as clay, to prevent the flow.

Chapter 5. Septic Tank Destruction

A. Application

1. The application for a Destruction Permit may be obtained through the LEA (Butte County Environmental Health). The completed application needs to be submitted along with the required fee and a scaled site plan indicating the location of the existing septic tank(s) and current or known future structures.

B. Issuance

1. The Destruction Permit will be issued along with a Declaration of Destruction form to be returned after final inspection. The LEA strongly recommends that all work be performed by a Licensed Contractor, although some work may be done by do-it-yourself property owners with prior LEA authorization. All work must meet LEA and Building Division requirements and pass inspection.
2. Obtaining the permit gives the LEA oversight of the abandonment process to ensure that all structural requirements are met and that the Declaration of Septic Tank Destruction is submitted at the time of inspection.

C. Process

1. The septic tank must be pumped and certified empty by a Certified Septage Pumper.
2. If the tank is to be destroyed in place and is greater than 5’ from any existing or future proposed structures, the person performing the work must ensure that the bottom of the tank is broken such that it is unable to hold water, and then filled with self-compacting soil, sand, or pea gravel. Should the person performing the work choose to fill the empty tank with 2-sack slurry, breaking the bottom of the tank is not required. Should the person performing the work choose to remove the tank, the excavation must be backfilled with clean self-compacting soil, sand, or pea-gravel.
3. If the tank is less than 5’ from any existing or future proposed structures, a two-sack slurry mixture must be used to fill the tank; otherwise, a Professional Engineer must certify the destruction methodology utilized.
4. Arrangements for inspection of the system destruction must be made with the LEA. In some instances, the Licensed Contractor may be able to submit electronic documentation of the destruction process in place of an on-site inspection.
5. The person performing the work must submit the Declaration of Destruction form provided.

Chapter 6. Standard Gravity Systems

Standard gravity systems are on-site wastewater systems consisting of a septic tank and a gravity distribution drainfield. Standard gravity systems, as used in this Manual, include those that utilize shallow trench depth, standard trench depth, or deep trench depth gravity drainfields. (Note: Deep trench drainfields requiring pressurized rather than gravity distribution may be found under other applicable requirements of this Manual.)

A. Site Requirements

1. Soils in the primary and replacement drainfield area will allow a vertical separation of 36 inches to be maintained.
2. The site has not been filled or the soil has not been modified in a way that would adversely affect functioning of the system.
3. The site will not be on an unstable landform, where operation of the system may be adversely affected.
4. The site of the drainfield and replacement areas must not be covered by asphalt or concrete unless site constraints allow no other feasible alternative.
5. The site of the drainfield and replacement areas must not be subject to the activity associated with vehicular traffic, corrals, pens, arenas or other concentrations of livestock, or other activity which would adversely affect the soil or integrity of the system.
6. The slope of the ground in the drainfield and replacement areas will not exceed 30% for a standard gravity system. When the slope of the ground exceeds 30%, the requirements of Chapter 16 of this Manual for Steep Slope Systems will apply.

B. Drainfield Excavation Requirements

1. Drainfield trenches must be constructed in accordance with the following standards, unless otherwise specified:
    a. Length maximum: 100 feet
    b. Bottom width minimum: 12 inches
    c. Bottom width maximum: 36 inches for drainfield trenches; wider excavations may be considered by the LEA on a case-by-case basis
    d. Depth: 12-36 inches
        (1) 6-18 inches for Shallow Trench
        (2) 18-36 inches for Standard Trench
        (3) >36 inches is not considered a standard gravity system. Refer to Chapter 6 of this Part of the Manual.

2. Minimum distance of undisturbed soil between drainfield trenches (inner sidewall-to-inner sidewall) must be 6 feet.
3. There must be a minimum of 12 inches of backfill over the drain rock.
4. Drain rock will extend the full width and length of the drainfield trench. There must be at least 6 inches of drain rock under the distribution pipe and at least 2 inches over the distribution pipe.
5. A soil barrier must be placed on top of the drain rock to exclude fines from the drain rock. The barrier will consist of filter fabric meeting the minimum specifications outlined in this Manual, straw, or untreated building paper.
6. Inspection ports must be installed at the end of each drainfield trench as follows:
    a. Each inspection port must extend to the finished grade.
    b. The ground surrounding the inspection port must be graded so that surface water does not accumulate adjacent to the port.
    c. The inspection port must be capped to prevent vandalism and tampering.
    d. Inspection ports must have a minimum diameter of four (4) inches.

C. Distribution

1. Level Sites
    a. For two or more laterals use a distribution box.
    b. Tie in the ends of the laterals to create a closed loop system when site conditions allow.
    c. Level distribution boxes with water to assure even flow. Flow equalization devices are recommended.
2. Sloped Sites
    a. Use a distribution box at the uppermost lateral and tightline from the distribution box to the beginning of the down slope laterals

D. Shallow Trench Systems

When the drainfield trench (measured at down slope sidewall) is excavated less than 24 inches into the original grade, the following additional requirements will apply:

1. Soil used for cover must be the same Soil Group (identified in Chapter 1 of this part of the Manual) as that which was excavated for the trench or a Soil Group that has a higher rate of percolation that that which has been excavated.
2. The drainfield area will have the vegetation removed and must be scarified, parallel to contours, no deeper than 2 inches at the time of construction.

3. Soil cap will extend a minimum of 5 feet beyond the exterior trench sidewall on the upslope side and 10 feet elsewhere.
4. The site must be contoured and landscaped in accordance with the approved construction plan and permit requirements in order to shed water, control erosion and to prevent surface drainage onto the system.
5. The site must be protected from the activity of vehicular traffic, corrals, horse arenas, stables, or other activities that could damage the system or the integrity of the soil.

E. Pump Systems

When a pump is utilized to enable gravity drainfield trenches upslope of the structure to be served, the following additional requirements will apply:

1. The pump chamber, pump tank, and/or dosing tank must meet the requirements specified in Part Two of this Manual.
2. The pump intake must be provided with a screen.
3. The pump tank (or second compartment of the septic tank) will have capacity sufficient to deliver the design dose and have a minimum additional storage capacity above the high level alarm of one-half the daily design flow so that, in the case of pump failure or power outage the tank has the capacity to accept a limited amount of wastewater from the residence or commercial establishment.
4. Each tank must be installed on a stable level base, generally consisting of 3 inches of pea gravel or sand.
5. Each pump tank must be provided with a watertight riser extending to the ground surface or above, with a minimum inside horizontal measurement equal to or greater than the tank access manhole. Provision must be made for securely fastening the manhole cover.
6. Pump tanks in high groundwater areas must be weighted or provided with an anti-buoyancy device to prevent flotation as per the manufacturer's recommendation and as required in Part 2 of this manual.
7. Specialized Use of Pump with Pump Basin

   A specialized purpose for use of a pump and pump basin is to address the issue of plumbing elevation for a portion of a residence, or a remote bathroom for outbuildings, being too low in elevation relative to the septic tank to allow gravity flow to the septic tank. In these cases,

   a. A pump basin with pump may be utilized when any toilet being serviced, in the case of residential application, is not the sole toilet utilized by the residence.

b. A solids handling pump, rather than a grinder pump, must be used and must pump directly into the septic tank with a 4 inch penetration 10 ft from the tank inlet.

F. Gravelless Chamber and Bundled Expanded Polystyrene (EPS) Synthetic Aggregate Systems

1. With 100% of the area required for a gravel-filled drainfield established and dedicated (for initial and replacement fields) reduced-size gravelless chamber bundled EPS synthetic aggregate drainfields may be designed and installed.
2. System design, layout, and installation must be done in a manner easily facilitating the installation of additional gravelless chamber or bundled EPS synthetic aggregate drainfield if future conditions necessitate such action.
3. Except for those serving seasonal dwellings, the drainfield size using gravelless chambers or bundled EPS synthetic aggregate products may be reduced by 30%, provided no additional sizing reductions (such as would otherwise be allowed for use of pressurized distribution or supplemental treatment) are utilized in the design of the drainfield system.
4. Wastewater from residential sources must receive pre-treatment at least equal to that provided in a conventional two-compartment septic tank, before discharge to a gravelless drainfield.
5. Drainfields using gravelless distribution products must be installed according to the manufacturer's instructions, in a manner that is consistent with these standards and with state and local rules.

Chapter 7. Deep Trench Systems

When the drainfield trench is excavated deeper than 36 inches into the finished grade, the following additional requirements will apply:

A. The trench will be filled with an approved medium to course sand to within 24 inches of the finished grade so that wastewater from the pipe and gravel dispersal system will discharge over the sand bedding in the deep trench.

B. The system will be sized based on the texture and/or percolation rate of the receiving soil at the bottom of the trench.

C. If the trench is deeper than 48 inches beneath the finished grade, pressurized distribution over the sand will be required.

D. Minimum distance of undisturbed soil between drainfield trenches (inner sidewall-to-inner sidewall) within a deep trench drainfield must be 2 times the depth of the trench, up to 10 feet, except in the case of a steep slope system as otherwise described in this Manual.

Chapter 8. Pressurized Distribution Systems

A. Pipe, Valves, and Fittings

1. All pressure distribution pipes and fittings, including transport lines, manifolds, laterals and fittings, must be adequately sized for the design flow.
2. Pressure transport piping must be uniformly supported along the trench bottom, and at the discretion of the LEA, it must be bedded in sand or other material approved by the LEA.
3. The ends of lateral piping will have 90 degree long sweeps and ball valves or threaded caps housed in valve boxes that accommodate threaded plugs or caps.
4. All joints in the pressure distribution manifold, lateral piping, transport pipe, must meet ASTM Specification D-1785.
5. A gate valve or ball valve must be placed on the pressure transport pipe inside or outside of the pump riser, in or near the dosing tank.
6. A check valve must be placed between the pump and the gate valve, when required. A check valve is not required if the pump has an internal check valve. All check valves and gate valves must be in an accessible and protected location for maintenance and repair.
7. An anti-siphon valve must be placed between the pump and leach field when the leach field is down slope of the pump.
8. All valves must be placed in boxes accessible for maintenance from the surface.

B. Dosing Tanks

1. The pump chamber, pump tank, and/or dosing tank must meet the requirements specified in Part Two of this Manual.
2. Duplex alternating pumps may be required by the LEA for some installations (e.g. large systems approved for commercial facilities).
3. The dose volume must be sufficient to fully pressurize the lines, assuring equal distribution through the system. The dose volume must be sufficient to refill any part of the pressure distribution system (including supply line and lateral lines) that has been designed to drain following a dose (for example, where necessary to prevent freezing in cold weather), and then deliver sufficient additional volume to disperse the daily design flow in an appropriate number of doses per day. Drainfield performance is enhanced when the daily flow is dispersed in smaller, more frequent doses throughout the day. In most applications, between 12 and 24 doses per day per zone, is appropriate, although a number outside of that range may be appropriate in some cases where it is not practical to design the system

to deliver twelve or more doses, or where it is otherwise undesirable to design the system within that range of doses.

C. Dispersal Trenches or Beds

1. The top of the drain rock must be covered with filter fabric, straw or untreated building paper.
2. A minimum of 12 inches of backfill is required over the filter material within the drainfield trench.

D. Hydraulic Design

1. Orifices will have a minimum diameter of 1/8 inch and be evenly spaced at a distance between 2 and 6 feet. Orifices larger than 1/8 inch shall be evaluated on a case by case basis due to design constraints related to dose volume, effluent quality, and dispersal field size.
2. There must be a minimum 2 foot head at the orifice farthest from the manifold and no more than 10% head variation within a drainfield trench.
3. The effect of back drainage of the pressure distribution system must be evaluated for its impact upon the dosing tank and system operation.

E. Installation

1. All orifices of pressure distribution laterals must be covered with orifice shields to prevent soil washout.
2. Lateral piping must be laid in the horizontal center of the trench and level to within 2 inches in 100 feet.
3. Inspection ports must be placed at the end of the pressure distribution lateral within the drainfield trench.
4. Each dosing tank must be installed on a stable level base.
5. Each dosing tank must be provided risers as described in Part 2 of this Manual.
6. Dosing tanks located in high groundwater areas must be weighted or provided with an anti-buoyancy device to prevent flotation as per the manufacturer's recommendation and as required in Part 2 of this manual.

F. Sloping Sites

1. Ball or gate valves or flow restrictors must be installed on each pressure distribution lateral to facilitate regulation of flow within each lateral.
2. The LEA will inspect the pressure distribution system for verification of hydraulic head over the pressure distribution laterals ("squirt height test").
    a. Water and a source of generated electricity must be available for this inspection.

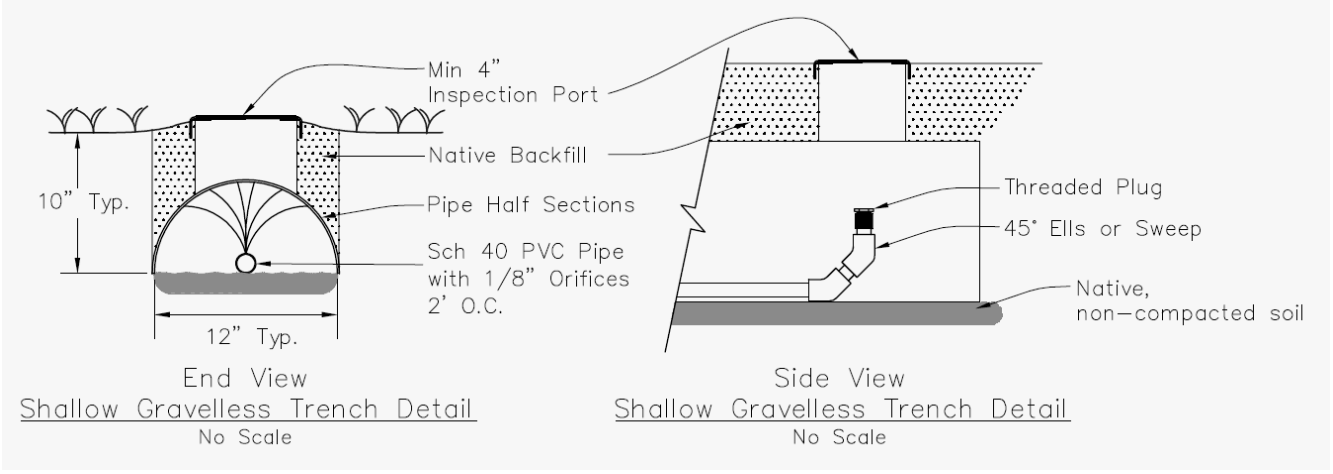
b. Photographic documentation of the pressure test may be accepted by the LEA on a case-by-case basis.

c. Where site conditions preclude the entire drainfield being left open for the pressure test, the LEA may allow a portion of the trenches to be covered prior to the test and observe the pressurized flow at the distal end of each lateral.

G. Shallow Pressure Drainfields Utilizing Small Diameter Chambers

Pressure distribution systems may be installed within shallow, small diameter chambers constructed from plastic irrigation pipe. These systems must meet the following criteria:

1. Dispersal is preceded by supplemental treatment certified by NSF/ANSI to achieve BOD and TSS reduction to 10 mg/l each (mean).
2. The chambers must have an adequate footing to support the soil cover and all normal activity.
3. The plastic pipe or chamber must be minimum 12-inches in diameter and be rated Schedule 40 or H-10.
4. The LEA may allow trenches on minimum 3-foot centers maintaining at least 2 feet of undisturbed soil between parallel trench sidewalls.
5. The distribution piping will use 1/8-inch diameter orifices.
6. Each line must be equipped with a minimum 4-inch diameter inspection port.
7. The system must be installed so that the trench depth will be 10-12 inches beneath the original ground surface.
8. Effluent must be micro-dosed to the dispersal field at least 18 times in each 24-hour period.



End View
Shallow Gravelless Trench Detail
No Scale

Side View
Shallow Gravelless Trench Detail
No Scale

Chapter 9. Subsurface Drip Irrigation

Subsurface Drip Irrigation is a method of dispersing wastewater uniformly over a large area by using numerous emitters installed at a shallow depth and very small doses.

A. Supplemental treatment is required prior to dispersal utilizing subsurface drip irrigation.

B. Minimum depth of drip line must be 6 inches.

C. Subsurface drip dispersal systems must be designed, installed and managed to provide even distribution and unsaturated subsurface flow.

D. All subsurface drip dispersal system materials must be warranted by the manufacturer for use with wastewater and resistant to clogging from solids, bacterial slime and roots.

E. Fittings used to join drip line to the distribution and flush manifolds must be in accordance with the manufacturer's recommendations.

F. All emitters in the drip tubing installed on sloping sites must be pressure compensating.

G. The subsurface drip dispersal system must be designed in the configuration that would minimize the flowing of effluent to the lowest area of the field when the pump shuts off or when the flow depressurizes.

H. A minimum velocity of 0.5 ft/sec or greater velocity if recommended by the manufacturer for field flushing of the laterals is required.

I. All subsurface drip dispersal systems must be designed with a dosing controller with automatic field flushing, for zone alternating, for dose frequency, for dose volume and for flushing of the filters.

J. All subsurface drip dispersal systems must be designed with a bypass line to facilitate field flushing.

K. All subsurface drip dispersal systems must be designed with filters to remove articles 100 microns or larger.

L. All subsurface drip dispersal systems must be designed with air relief valves placed at the highest point on both supply and return manifolds.

M. All the drip dispersal systems must be designed to accept flows that have residential-like wastewater quality.

N. Sizing criteria must be based application rates shown in Table One of this Manual.

O. All subsurface drip dispersal systems must be installed by certified installers with specific training in the installation of subsurface drip dispersal systems. Proof of the specified training by way of certification or a letter from an approved trainer is required.

P. Installation of the subsurface drip dispersal system must be per the manufacturer's instructions.

Chapter 10. Supplemental Treatment Systems

Supplemental treatment systems are on-site wastewater systems that provide a specified level of treatment prior to dispersal into the drainfield.

A. Supplemental Treatment Components

1. Supplemental treatment components must be designed to meet the following BOD and TSS concentrations and, where nitrogen is identified in the RWQCB basin plan as a water quality concern, the following nitrogen effluent concentration:

   a. 30-day average BOD concentration will not exceed 30 milligrams per liter (mg/L), or alternately, a carbonaceous BOD (CBOD) in excess of 25 mg/L

   b. 30-day average TSS concentration will not exceed 30 mg/L

   c. 30-day average TN concentration will not exceed 10 mg/L as nitrogen

2. Testing to comply with these performance levels must be conducted based on effluent analysis with the following minimum detection limits:

Parameter	Detection Limit
BOD	2 mg/L
TSS	5 mg/L
Total Nitrogen	1 mg/L

B. Disinfection Components

1. Add-on components performing disinfection must be designed to achieve an effluent total coliform bacteria concentration, at the 95th percentile, of not greater than the following:

   a. 10 MPN per 100 ml prior to discharge into the dispersal field where the soils exhibit percolation rates of 1-10 minutes per inch or where the soil texture is sand; or

   b. 1,000 MPN per 100 ml prior to discharge into the dispersal field where the soils exhibit percolation rates greater than 10 minutes per inch or consist of a soil texture other than sand.

2. Testing of supplemental treatment components that perform disinfection must be evaluated quarterly based on analysis of total coliform with a minimum detection limit of 2.2 MPN. Such systems must be maintained to comply with the performance requirements at all times.
3. When supplemental treatment is required followed by disinfection in order to meet reduced vertical separation requirements for existing parcels, the supplemental treatment system utilized will typically be a single-pass sand filter. When supplemental treatment system other than a single-pass sand filter is utilized preceding disinfection, the testing frequency for compliance with effluent quality limits will be increased from quarterly to monthly for the first year of operation, or longer if needed to verify reliable treatment,

C. Where feasible, as determined by the LEA, supplemental treatment components must be equipped with a telemetric alarm that notifies the owner and O&M Specialist in the event of system malfunction.

D. All supplemental treatment systems must be followed by pressurized distribution or subsurface drip irrigation for dispersal, except for where seepage pits are utilized.

E. All supplemental treatment systems must be designed by certified designers and installed by certified installers with specific training in the installation of the type of system utilized. Proof of the specified training by way of certification or a letter from an approved trainer is required.

F. All supplemental treatment systems must maintain a current Operating Permit and be periodically inspected and monitored by a certified Operation and Maintenance Specialist as required in the On-Site Wastewater Ordinance and Part 4 of this Manual.

G. Supplemental Treatment Systems in Lieu of Standard gravity systems

1. When a drainfield site is utilized that meets the criteria described above, nothing will preclude the applicant from opting to use a supplemental treatment system in lieu of a standard gravity system.
2. When siting an on-site wastewater system, the drainfield must be located, whenever possible, on that portion of the parcel with a minimum vertical separation of 36 inches, Soil Groups B, C, or D, and a percolation rate (when performed) of 6-60 minutes per inch .

Chapter 11. Proprietary Systems

A. A proprietary supplemental treatment system provides treatment of wastewater by exposing the effluent to a contact medium under diverse environmental conditions in a self-contained enclosure.

B. Proprietary supplemental treatment systems must be designed to meet the level of treatment specified in Chapter 9 of this Manual.

C. All proprietary supplemental treatment systems must be designed by certified designers and installed by certified installers with specific training in the installation of the type of system utilized. Proof of the specified training by way of certification or letter from an approved trainer is required.

D. All owners of proprietary treatment systems must maintain current Operating Permits and be periodically inspected and monitored by certified Operation and Maintenance Specialist.

E. Where feasible, as determined by the LEA, supplemental treatment components must be equipped with telemetric alarms that notify the owner and O&M Specialist in the event of system malfunction.

F. All proprietary supplemental treatment systems must meet NSF/ANSI (National Sanitation Foundation/ American National Standards Institute), Standard 40.

G. NSF approved proprietary components may not be used independently. Proprietary components may be used as part of the overall wastewater treatment system as tested and approved by NSF.

H. Manufacturers of proprietary systems must provide for the initial two years of serve and maintenance.

I. Manufacturers of proprietary systems must provide homeowners with Operation and Maintenance Manuals.

J. When proprietary supplemental treatment is required followed by disinfection in order to meet reduced vertical separation requirements for existing parcels, testing for compliance with effluent quality limits will be required for the first year of operation, or longer if needed to verify reliable treatment.

K. Manufacturer of proprietary systems must provide the LEA at least every two years with a list of O&M providers and installers certified by the manufacturer to provide those services.

Chapter 12. Single-Pass Sand Filters

A. Influent Wastewater Strength

1. Single-pass sand filters are designed for treating residential strength wastewater. The wastewater applied to the single-pass sand filter must not be higher in strength than 220 mg/l BOD_5 or 145 mg/l TSS). Lower wastewater strengths, without increased flow rates are preferable for assuring long term operation of a single-pass sand filter system. High strength wastewater shall require pretreatment in order to reduce its strength prior to introduction into a single-pass sand filter and the soil dispersal component.

B. Daily Wastewater Flow - Design Estimates

The minimum wastewater design flow shall be as specified in Chapter 3 of this part of the Manual.

C. Locational Requirements

1. The minimum setback requirements for closed bottom single-pass sandfilters will be the same as those for septic tanks.
2. The minimum setback requirements for open bottom single-pass sandfilters will be the same as those for a standard gravity drainfield or leach bed.

D. Design Standards

1. Filter media must meet the specifications outlined in Part 2 of this Manual.
2. Filter Bed Sizing
    a. The loading rate to the sand filter must not exceed 1.0 gallon/day/square foot, using appropriate daily wastewater flow design estimates.
    b. The media depth must be a minimum of 24 inches.
3. The filter bed is contained either in a flexible membrane lined excavation as specified in Part 1 of this Manual, or in another containment vessel approved by the LEA.
4. Wastewater Distribution
    a. Pressure distribution is required within the sandfilter and pressure distribution of subsurface drip irrigation is required for dispersal of sandfilter-treated effluent and must comply with the requirements specified in Chapters 7 and 8 of this Manual.
    b. The wastewater must be applied to the layer of drain rock atop the filter media as specified in Chapters 7, or sprayed upward against the top of gravelless chambers.

E. Timed dosing system is required and the dosing frequency or dose volume is dependent on the media specification used with the sand filter. To assure that appropriate dose volumes are delivered to the sand filter, the timer must be set to dose a minimum of 12 times daily.

F. Installation

1. Containment must be structurally sound and have sufficient geometric and dimensional integrity to protect the liner.
2. In order to prevent differential settling when the sand filter is put into service, the filter media must have a uniform density throughout.
3. A geotextile filter fabric must be placed on top of the gravel bed.

4. The cover must consist of no more than one foot of soil. The cover soil must be capable of maintaining vegetative growth while not impeding the passage of air (sandy loam or coarser) and be contoured and landscaped in accordance with the approved construction plan and permit requirements in order to shed water, control erosion and to prevent surface drainage onto the sand filter. Plant cover must be shallow root vegetation as generally described in the system design and operation and maintenance manual.
5. Two observation and monitoring ports must be installed in the sand filter. One observation and monitoring port must be installed to the interface between the bottom of the drainrock and the top of the media. A second observation and monitoring port must be installed to the bottom of the under drain. The pumpwell may be used as the second observation port.
6. Liner patches, repairs and seams shall have the same physical properties as the parent material.
7. Site considerations and preparation:
    a. The supporting surface slopes and foundation to accept the liner shall be stable and structurally sound including appropriate compaction. Particular attention shall be paid to the potential of sink hole development and differential settlement.
    b. Soil stabilizers such as cementations or chemical binding agents shall not adversely affect the membrane; cementations and chemical binding agents may be potentially
    c. Every effort shall be made to minimize the strain (or elongation) anywhere in the flexible membrane liner.
8. Construction and installation:
    a. For contained-design sand filter, grade the bottom of the excavation to provide a sloping liner surface, from the outer edge of the filter toward the point of under drain collection. Slope shall equal 8 inches fall overall or one inch of fall per foot of run, whichever is the greatest.
    b. Sides of the excavation shall be smooth, free of possible puncture points.
    c. Boots shall be bedded in sand and installed in accordance with manufacturer's specifications.
    d. Liner placement
        (1) Liners shall be installed in accordance with manufacturer's specifications, including those for:
            (i) Temperature, precipitation

(ii) Sand bedding

(iii) Sealant type and procedure for use

(iv) Liner size

(v) Transport, handling, and storage

(vi) Deployment of panels

(vii) Anchoring of liner edges

(viii) Field seaming when necessary

(ix) Field repairs

(2) A site inspection shall be carried out by the LEA or by the certified designer and the installer prior to liner installation to verify surface conditions and adherence to manufacturer's and designer's specifications

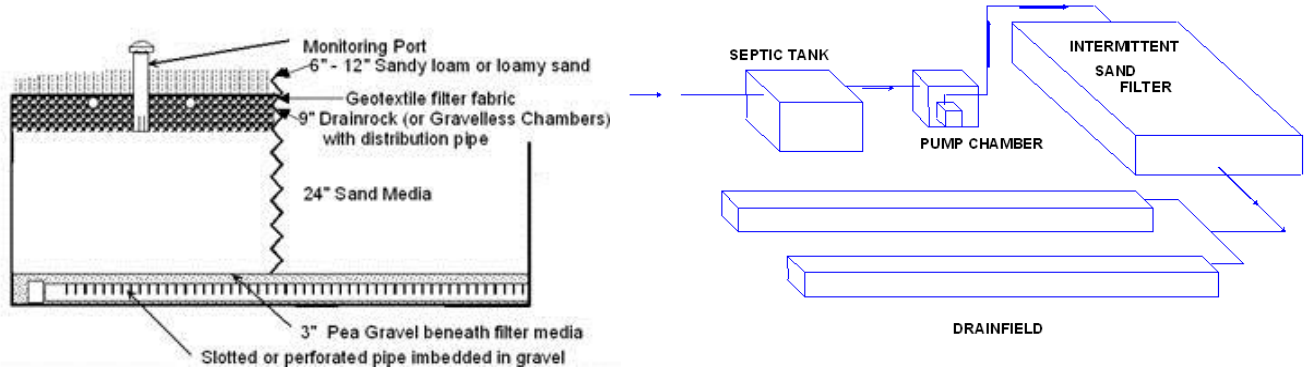
(3) Completed liner installations shall be visually checked for punctures, rips, tears and seam discontinuities before placement of any backfill. At this time the installer shall also manually check all factory and field seams with an appropriate tool. In lieu of, or in addition to, manual checking of seams by the installer, either of the following tests may be performed;

(i) Wet Test: The lined basin shall be flooded with water to within 6 inches of the bottom of the liner after inlets and outlets have been plugged. There shall not be any loss of water in a 24-hour test period.

(ii) Air Lance Test: Check all bonded seams using a minimum 50 PSI (gauge) air supply directed through a 3/16 inch (typical) nozzle held not more than 2 inches from the seam edge and directed at the seam edge. Riffles indicate unbonded areas within the seam, or other undesirable seam construction.

(iii) If the boot may be submerged in a seasonal high water table, performance testing of the sand filter/boot for leakage must be conducted by blocking the outlet pipe, and flooding the liner with a sufficient depth of water to submerge the boot seams. There shall not be any loss of water in a 24-hour test period.

G. System Drawings



Chapter 13. Mound Systems

A. Influent Wastewater Strength

Mound systems are designed for treating residential strength wastewater. The wastewater applied to the mound system must not be higher in strength than 220 mg/l BOD_5 or 145 mg/l TSS). Lower wastewater strengths, without increased flow rates are preferable for assuring long term operation of a mound system. High-strength wastewater shall require pretreatment in order to reduce its strength prior to introduction into a mound system.

B. Daily Wastewater Flow - Design Estimates

The minimum wastewater design flow shall be as specified in Chapter 6 of this Part of the Manual.

C. Locational Requirements

The minimum setback requirements for mound systems will be the same as those for a standard gravity drainfield or leach bed.

D. Design Standards

1. Media Specifications. Filter media must meet the requirements outlined in Part 2 of this Manual.
2. Minimum Effective Soil Depth

   A minimum of 18 inches of undisturbed, unsaturated, original soil as measured from the original ground surface is required for placement of a mound after all clearing, leveling and other site disturbance during lot development is complete.
3. Media Specifications.
   a. Filter media must meet the specifications outlined in Part 2 of this Manual.

b. In order to prevent differential settling when the mound is put into service, the filter media must have a uniform density throughout.

4. Application Rates.

a. The application rate for the mound infiltration area (gravel bed) must not exceed 1.0 gpd/ft^2.

b. The application rate for basal area will be based on soil type.

5. Minimum Dosing Frequency

Timed dosing system is required. The dosing frequency or dose volume is dependent on the media specification used as the filter material. To assure that appropriate dose volumes are delivered to the mound system, the timer must be set to dose a minimum of 12 times daily.

E. Installation

Unless otherwise specified in this Manual, mound systems shall be installed following the procedures and specifications delineated in the "Recommended Standards and Guidance for Performance, Application, Design, and Operation & Maintenance Mound Systems" (Washington State Department of Health, July 2012). . Copies of this document will maintained and provided by the LEA.

1. Cap and Topsoil Depth

a. The cover soil must be capable of maintaining vegetative growth while not impeding the passage of air (sandy loam or coarser) and be contoured and landscaped in accordance with the approved construction plan and permit requirements in order to shed water, control erosion and to prevent surface drainage onto the sand filter.

b. The final settled depth of the cap and topsoil should be no less than 12 inches above the center and 6 inches above the outer edge of the bed. Additional depth of topsoil may be needed during final construction activities to assure that the minimum depths are achieved following natural settling of the soil.

c. The mound must not be left without a vegetative cover or allowed to be covered with weeds. Mowed turf grass and turf sod are the best vegetative covers for mounds.

F. Mound Placement

1. On sloping sites, the mound must be aligned with its longest dimension parallel to the site contours so as not to concentrate the effluent into a small area as it moves laterally down slope.

2. The mound must not be aligned, by design or construction, perpendicular to the contours.

3. On all sites the infiltration bed must be as long and narrow as possible to limit the linear loading rate of effluent to assure that all the effluent infiltrates into the natural soil before it reaches the toe of the filter media.
4. If the site does not permit the design of a "long and narrow" mound along the contours of the site, other on-site sewage treatment and dispersal technology must be selected. Mound systems are only suitable for sites where all of the design and siting criteria can be satisfactorily met.
5. Two or more beds on the same downhill plane.

G. Effluent Dispersal within Mound

A method providing uniform distribution with timed dosing throughout the bed in the filter media is required, either through use of pressure distribution as specified in Chapter 10 of this part of the Manual, or through use of subsurface drip irrigation, as specified in Chapter 10 of this part of the Manual.

H. Monitoring and Observation Ports

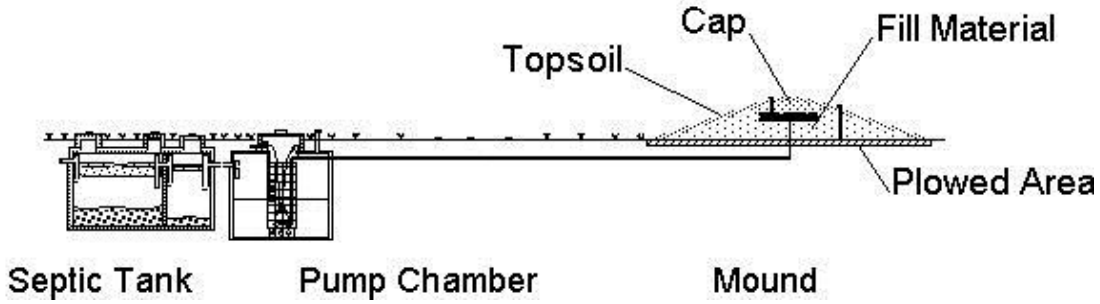
Each mound should have a minimum of two monitoring and observation ports, one placed in the infiltration bed down to the gravel-sand, and one down slope from the bed down to the sand-native soil interface. Unless otherwise specified in this Manual, down gradient observation and monitoring ports shall be installed as specified in the Mound System Manual (State Water Resources Control Board) in its current final draft or as hereafter adopted and updated by the State Water Resources Control Board.

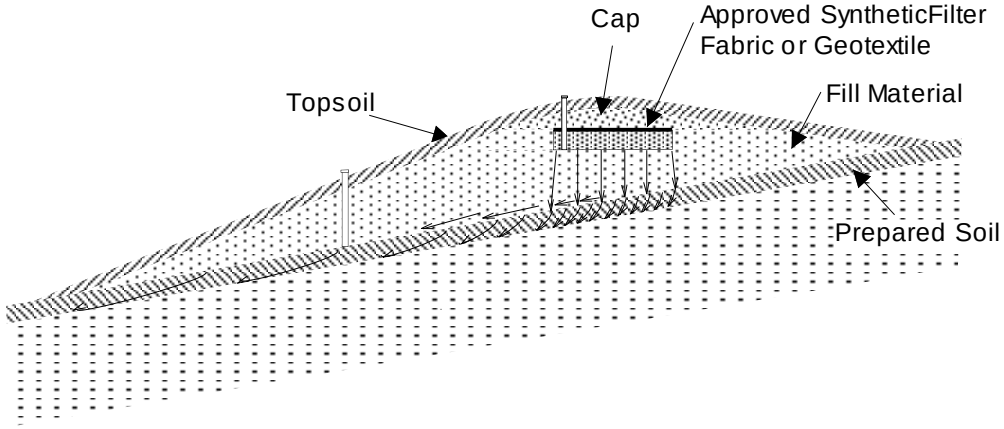
I. Protection of mound system placement area

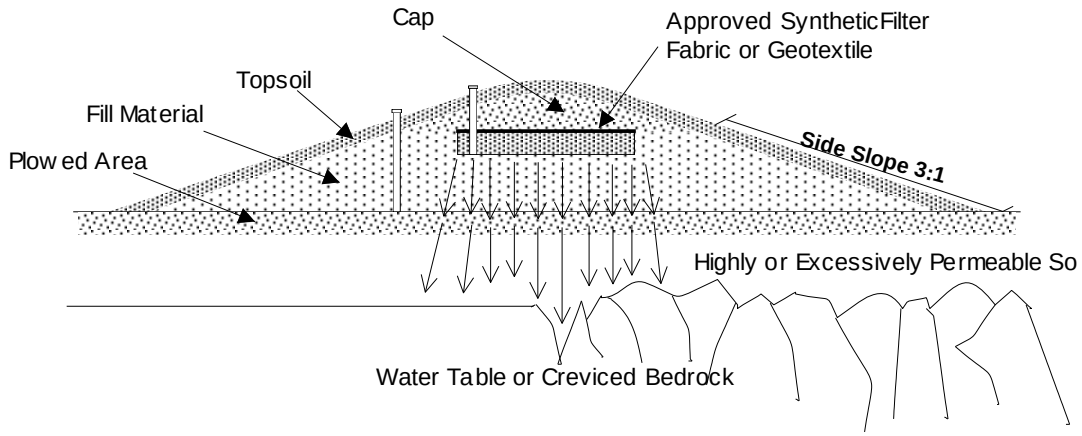
The designer will be responsible for the adequacy of, and the installer's substantial compliance with, the installer's construction plan. The construction plan must include provisions addressing:

1. Type of excavation equipment that will be used
2. Routes of ingress and egress of construction vehicles to assure maximum protection of the mound placement area
3. Means to assure that the area reserved for system replacement is not disturbed during the mound construction process including as necessary, instructions for erecting a temporary construction fence to protect the primary and reserve mound areas and adjacent area down slope of the mound placement area
4. Method to assure that soil moisture content is sufficient to allow construction of the mound without soil compaction or smearing
5. Method for preparing the native soil-filter material interface
6. Method for removing native vegetation

J. System Drawings


Cap
Fill Material
Topsoil
Plowed Area
Septic Tank
Pump Chamber
Mound


Cap
Approved SyntheticFilter
Fabric or Geotextile
Topsoil
Fill Material
Prepared Soil


Cap
Approved SyntheticFilter
Fabric or Geotextile
Topsoil
Fill Material
Plowed Area
Side Slope 3:1
Highly or Excessively Permeable So
Water Table or Creviced Bedrock

Chapter 14. Engineered Fill

A. Pre-Treatment

Wastewater discharged into engineered fill will have supplemental treatment meeting the effluent specifications specified in this Manual.

B. Site/Fill Evaluation

1. Primary and replacement area will be analyzed by a California registered civil engineer to assure that breakout of wastewater will not occur outside the boundaries of the disposal area.
2. Site preparation and placement of fill must be under the direct supervision of a California registered professional geologist, engineer, or nationally certified soil scientist.
3. Engineered fill shall be evaluated for winter groundwater when site conditions or previous groundwater monitoring results indicate the seasonal groundwater level may be less than two feet from original grade.
4. Engineered fill shall be evaluated after stabilization by the LEA and supervising engineer, geologist, or soil scientist for adequate permeability and percolation.
5. At least 3 percolation tests shall be performed on the consolidated fill soil after placement.
6. A minimum of two sieve analyses shall be conducted prior to placement to test for oversize material.

C. Native Receiving Soil

1. Native soil depth shall be a minimum of 12 inches (after removal of the organic top soil layer) in all areas of the proposed drainfield and repair area.
2. If the limiting layer consists of material coarser than sand, or fractured material, the system designer shall demonstrate that there will be no saturated soil conditions formed at the soil/limiting layer interface due to capillary forces in the soil.

D. Fill Material

1. Fill shall compensate for the lack of in-place soil at a 1.5 to 1 ratio so that a one foot deficiency in soil column depth shall require one and one half feet of fill. A minimum of 12 inches of compensating fill shall be required.
2. Fill will be engineered to the specifications of loamy sand with no more than 15% fines. At least 75% of fill material shall pass the 2mm sieve. Any sieve analysis falling outside of a loamy sand specification shall be cause for rejection of all fill material.

3. Engineered fill, after stabilization, must have a percolation rate between 5 and 60 mpi.
4. All organic material and material over 1" in diameter shall be removed from fill.

E. Dispersal

1. Pretreated effluent application rate shall be applied by drip irrigation at a maximum application rate of 0.2 gallons/square foot/day.
2. The drip line layout design shall be reviewed by the approved subsurface drip system manufacturer's factory trained designer.
3. The emitters will be placed at the top of the compensating fill layer, with an additional minimum 12 inches of cover material over the emitters.

F. Construction

1. The slope in the area to be filled shall be no more than 20% slope. For slopes greater than 20%, a slope stability analysis by a California registered geotechnical engineer shall be provided.
2. The organic top soil layer shall be removed from the native soil. Grubbed, native soil shall be worked with a chisel or shank plow with crawler or tracked equipment (no rubber tired vehicles allowed) to scarify the top 4". All stumps and roots in excess of ¼" diameter shall be removed from the native soil.
3. If fill soil must be transported to the fill site over long distances, care shall be taken to prevent excessive segregation of soil separates.
4. Fill shall be placed as dry as possible and when its moisture content will not cause excessive compaction.
5. An initial fill soil lift of 6” shall be blended into the scarified native soil. Subsequent lifts of fill shall be no greater than 6". The top 2 to 3 inches of each subsequent lift shall be scarified prior to addition of subsequent lifts.
6. After placement, soil shall be consolidated by a means chosen by the design engineer (e.g. light compaction by tracked equipment, by allowing the soil to consolidate naturally over a rainy season, or by watering with at least the estimated pore volume of the fill).
7. Side slopes of any soil “mound” shall be a 3 to 1 slope. For low transmissivity soils a certified design consultant may design shallower slopes. The side slopes shall begin 48 inches from any dispersal line.
8. After fill is placed and approved, system shall be crowned with a loam or sandy loam soil type to create a final cap. The bed cap shall be seeded with shallow rooted grass. Seeded areas shall be watered as necessary to establish and maintain vegetation over the life of the unit.

9. "Toes" of built areas shall remain accessible and visible with no vegetation taller than two inches high.
10. Each system shall be provided with one up gradient and two down gradient shallow monitoring wells finished into the limiting layer.

Chapter 15. Curtain Drains

A. A curtain drain may be required to intercept and/or drain water from a dispersal area. It shall be required to demonstrate that the site can be de-watered prior to issuing a permit.

B. Curtain drains are considered an integral part of the onsite wastewater system and will meet the minimum setback requirements to drainfield and repair areas and to the septic tank as set forth in this manual. However, curtain drains do not need to meet setback requirements to property lines, streams, lakes, ponds or other surface water bodies provided the designer certifies that the curtain drain will not pick up wastewater.

C. The curtain drain will consist of a trench a minimum of 12 inches wide dug to a depth of at least 6 inches into a limiting impermeable layer. There must be a minimum of 6 inches of pea gravel in the bottom of the trench on which a 4 inch perforated pipe is placed.

D. The curtain drain trench must be filled with drain rock. Prior to backfilling the trench, the drain rock must be enveloped and covered with filter fabric.

E. The trench must be situated so that captured water drains by gravity flow out of outlet pipes. Trench bottoms will maintain a minimum of 1% slope throughout the drainage trench. In areas where the outlet pipe will be subject to damage, the pipe must be adequately protected.

F. In the event that the discharge outflow from a curtain drain will impact a neighboring property, the trench outlet from a curtain drain will only discharge into a drainage channel or other conveyance designed for the transport of water, unless otherwise approved by the LEA.

Chapter 16. Off-Site Sewage Easements

A. When a system cannot be located on the lot or parcel to be served, an off-site easement may be considered.

B. Off-site easements may not be considered as an option for creating new lots or parcels, except when utilized for placement of and/or connection to a community wastewater system.

C. Whenever a system crosses a property line separating properties under different ownership, a recorded easement and/or covenant against conflicting uses must be provided. For properties under common ownership a recorded deed restriction must be provided.

D. Exhibits and legal descriptions of easements and deed restrictions must be prepared by a licensed land surveyor. Unless otherwise indicated by the LEA, a licensed surveyor will flag or otherwise delineate the easement area for field inspection.

Chapter 17. Non-Standard Non-Supplemental Treatment Systems

Non-standard non-supplemental treatment systems are onsite wastewater systems designed to address specific site and/or generation considerations. Examples include: steep slope systems, commercial systems, holding tanks, seepage pits, vault privies, and portable toilets.

A. Steep Slope Systems

When the site's ground slope in the drainfield area exceeds 30%, the following additional requirements and restrictions will apply:

1. A certified designer will design the system.
2. Steep slope systems are not permitted for creating lots and parcels.
3. Steep slope systems for existing parcels may only be developed in conformance with the county General Plan, zoning restrictions, recorded restrictions and notes on the subdivision or parcel map, and any other applicable county requirements.
4. For purposes of determining effective soil depth and vertical separation, the depth of limiting layer beneath the bottom of the trench must be measured from the upslope side of the drainfield trench bottom
5. The maximum trench width shall not exceed 24 inches.
6. The certified designer will provide a report verifying slope stability prepared by a geotechnical engineer.
7. The wastewater system must utilize pressurized or subsurface drip dispersal.

B. Non-Residential Systems

1. A certified designer will design the system.
2. High strength waste must be pretreated to domestic waste strength as described in Chapter 1 of this part of the Manual prior to discharge to the treatment and dispersal system.
3. For projected daily sewage flows up to 1,500 gallons, the septic tank will have a liquid capacity equal to at least one and a half days sewage flow, or 1,500 gallons, whichever is greater.

C. Non-Discharging Wastewater Systems

1. Holding Tanks

A holding tank is a watertight container designed to receive and store wastewater for disposal at another location. When a holding tank is proposed, the following requirements will apply:

a. The site cannot be approved for the installation of a standard gravity system or supplemental treatment system.

b. No area-wide public sewer system is legally and physically available.

c. The tank will serve only non-residential and non-commercial, limited use applications, such as a limited agricultural buildings and recreational facilities.

d. The cumulative daily design sewage shall not exceed 150 gallons per day.

e. The tank meets the specifications and is tested for water tightness as specified in Part 2 of this Manual.

f. The owner of the property will record a deed restriction agreeing to be served by a public sewer system when connection is feasible and described in the Onsite Wastewater Ordinance.

g. The owner will provide the LEA with:

   (1) A copy of a contract with a LEA certified septic tank pumper that shows the tank must be pumped at regular intervals or as needed to prevent use of greater than seventy-five (75) percent of the tank's capacity. The contents of the tank must be disposed of at an approved septage receiving facility, in an approved manner; and

   (2) A record of pumping dates and amounts pumped must be maintained by the property owner and made available to the LEA upon request.

h. A holding tank must be designed and installed under the inspection and approval of a certified designer.

i. Each tank will have a minimum liquid capacity of fifteen hundred (1,500) gallons.

j. Holding tanks will not be used as a method for sewage disposal for creating lots and parcels.

k. An Operating Permit will be required.

l. All installations will meet the following:

   (1) Be located and designed to facilitate visual inspection and removal of contents by pumping

(2) Be equipped with both an audible and visual alarm, transmitted to an appropriate off site location for remote notification or placed in another location acceptable to the LEA, to indicate when the tank is seventy-five (75) percent full. Only the audible alarm will be user cancelable

(3) Have no overflow vent at an elevation lower than the overflow level of the lowest fixture served

2. Vault Privies

A vault privy is a structure used for disposal of human waste without the aid of water. It consists of a shelter built above a subsurface vault into which human waste falls. The vault privy has no water connection. When a vault privy is proposed, the following requirements will apply:

a. The vault privy will only serve non-residential and non-commercial, limited use applications, such as primitive type picnic grounds, campsites, camps and recreation areas where septic tank and leach field systems are not practicable as determined by the LEA. Approval to permit vault privies will be considered by the LEA on a case-by-case basis.

b. The vault must be constructed in substantial compliance with the specifications for septic tanks and tested for water tightness as described in Part 2 of this Manual.

c. Vault privies shall not be sited in a floodway, and must be maintained to prevent health hazards and pollution of public waters.

d. An Operating Permit will be required.

e. The privy vault will not be allowed to become filled with excreta to a point within two (2) feet of the ground surface.

f. The excreta in the vault must be pumped out by a certified septage pumper as necessary to fulfill these requirements.

g. The privy must be maintained in a sanitary condition and in good repair.

h. No water-carried sewage may to be placed in vault privies. Contents of vault privies will not be discharged into storm sewers, on the surface of the ground or into public waters.

i. Structures must be free of hazardous surface features, such as exposed nail points, splinters, sharp edges, and rough or broken boards, and will provide privacy and protection from the elements.

j. Building ventilation must be equally divided between the bottom and top halves of the room. All vents must be screened with sixteen (16) mesh screen of durable material.

k. Buildings must be fly and rodent resistant, and will have self-closing doors with an inside latch.

l. Vaults must be vented to the outside atmosphere by a flue or vent stack having a minimum inside diameter of four (4) inches.

m. Interior floors, walls, ceilings, partitions, and doors must be finished with readily cleanable impervious material resistant to wastes, cleansers and chemicals. Floors and risers must be constructed of impervious material and in a manner that will prevent entry of vermin.

n. The seat opening must be covered with attached, open-front toilet seats with lids, both of which can be raised to allow use as a urinal.

o. A toilet tissue holder must be provided for each seat.

p. Holding chambers must be watertight and constructed of reinforced concrete, plastic, fiberglass, metal, or other material of acceptable durability and corrosion resistance, approved by the LEA, and designed to facilitate the removal of the wastes.

q. Vents must be sized to equal in area to a minimum of three (3) square feet.

r. A minimum clear space of twenty-four (24) inches between multiple unit installations and a clear space of twelve (12) inches from the seat opening to the side building wall in single and multiple units.

3. Portable Toilets

A portable toilet is any self-contained chemical toilet facility that is housed within a portable toilet shelter. The portable toilet has no direct water connection.

a. Portable toilets are intended to serve non-residential, limited use applications, such as primitive type picnic grounds, campsites, special events, and temporary construction sites where septic tank and leach field systems are not practicable as determined by the LEA. Portable toilets will not be used for residential or commercial applications.

b. An Operating Permit will not be required for temporary use of portable toilets.

c. Portable toilets must be maintained to prevent health hazards and pollution of protected waters.

d. No water-carried sewage may to be placed in portable toilets.

e. Contents of portable toilets will not be discharged into storm sewers, on the surface of the ground or into protected waters.

f. The requirements listed for vault privies, H through Q will also apply to portable toilets and are hereby incorporated by reference.

g. Portable toilets will have toilet bowls constructed of stainless steel, plastic, fiberglass, or ceramic or of other material approved by the LEA.

h. Waste passages will have smooth surfaces and be free of obstructions, recesses or cross braces that would restrict or interfere with flow of blackwater.

i. Biocides and oxidants must be added to waste detention chambers at rates and intervals recommended by the manufacturer.

j. Chambers and receptacles will provide a minimum storage capacity of 50 gallons per seat.

k. Portable toilet shelters will:

(1) Display the business name of the licensed sewage disposal service that is responsible for servicing them.

(2) Provide screened ventilation to the outside atmosphere having a minimum area of one square foot per seat.

(3) Provide a minimum floor space outside of the riser of 9 square feet per seat.

(4) Provide separate compartments with doors and partitions or walls of sufficient height to ensure privacy in multiple unit shelters except that separate compartments are not required for urinals.

D. Seepage Pits

A seepage pit is a drilled or dug cobble or gravel filled excavation installed to allow disposal of effluent from a septic tank or other on-site wastewater treatment unit. When a seepage pit is proposed, the following requirements will apply:

1. Seepage pits will not be used:

a. to create lots and parcels; or

b. when connection to a public sewer is feasible as described in the Onsite Wastewater Ordinance; or

c. when the site meets the requirements for other system types described in this Manual.

2. Seepage pits must be a minimum of thirty-six (36) inches in diameter.
3. The seepage pit must be filled up to the concrete collar with cobbles that are a minimum of three (3) inches in diameter in any dimension or with other drain rock approved by the LEA. The cobbles or drain rock must to be washed clean so as to be free of debris and dirt.
4. A system with multiple pits must be designed so each pit within the system receives equal quantities of sewage flow via distribution boxes.
5. Seepage pit header pipe inlets, risers, and collars must be watertight.
6. A minimum distance equal to twelve (12) feet of undisturbed soil will separate two or more seepage pits from each other.
7. Requirements When Seepage Pit is Utilized for New Construction
    a. At least one test boring to groundwater or ten (10) feet below the proposed design depth of the pits must be made in the lowest area of the proposed disposal area to evaluate soils. Additional test pits may be required at the discretion of the LEA to determine the suitability of the site for on-site sewage disposal.
    b. Seasonal groundwater monitoring must be required to assure a vertical separation of 10 feet on a year-round basis.
    c. Supplemental treatment will be required prior to discharge into seepage pit.
    d. Seepage pits may be used only to service a single-family residence.
    e. The depth of the seepage pit must be at a minimum of fifteen (15) feet and a maximum of thirty-five (35) feet below the ground surface.
    f. Effective soil type for discharge from the pit must be limited to sand or loamy sand, with or without gravel.
    g. An acceptable test boring will have a cumulative minimum 3-foot column of effective soil
    h. There must be a minimum excavation of one pit per bedroom.
    i. The seepage pit system must be designed by a certified designer.
8. Requirements When Seepage Pit is Utilized for System Repair
    a. The LEA may allow exceptions to the requirement for supplemental treatment of wastewater prior to discharge into seepage pits when <u>one</u> of the following two circumstances apply:
        (1) When all the following safety factors that minimize potential public health and water quality impacts of discharging wastewater into seepage pits apply to the system repair:

(i) The parcel with the failing system is serviced by a public water system;

(ii) A setback of 200 feet is maintained between the seepage pit and any surrounding well; and

(iii) Vertical separation to anticipated groundwater is increased by 50%.

(2) When the owner of the system being repaired declares a financial hardship and records a declaration on the property deed stating that the onsite wastewater system has been repaired in a manner that is nonconforming to the requirements of this Manual and acknowledging that supplemental treatment will be required at the time of property transfer.

Chapter 18. Graywater Reuse

A. Adoption by Reference.

The provisions for graywater systems specified in the California Plumbing Code are hereby adopted by reference and incorporated herein as minimum standards for graywater systems, unless otherwise noted in the Section.

B. No graywater system shall be approved, designed, constructed, or maintained unless a person or entity has been identified to operate and maintain the system in accordance with the requirements specified in the California Plumbing Code.

C. No person shall construct or maintain a graywater system unless the structure is served by a non-failing on-site wastewater system sufficiently sized to accommodate the full daily wastewater load generated by those using the structure.

D. LEA Notification Review and Permitting Requirements

1. Graywater systems identified as Clothes Washer Systems in the California Plumbing Code (systems designed to reuse only laundry waste) require only notification of the LEA.

2. Graywater systems identified as Simple Systems in the California Plumbing Code (systems designed to reuse 240 gallons per day or less of graywater) will require plan review by the LEA in addition to notification and may require a plumbing permit from the Butte County Building Department.

3. Graywater systems identified as Complex Systems in the California Plumbing Code (systems designed to reuse over 240 gallons per day of graywater) will require a Construction Permit issued by the LEA and will require a plumbing permit from the Butte County Building Department.

4. Unless otherwise authorized by the LEA, review of graywater systems requiring a Construction Permit will include:
    a. Soil evaluation or percolation testing in the manner specified by the LEA as appropriate for the intended use;
    b. Review of the design submitted by a qualified professional;
    c. Review of the system's operational manual as specified in Part Four of this Manual;
    d. Inspection of construction by the LEA.
5. Except for removal of solids from a septic tank by a certified pumper, no person shall service or replace an approved graywater system's components without first notifying the LEA so that parcel files can be updated, trends in equipment reliability can be tracked, and so that the person can be advised of any technical up-dates relevant to service that will be provided.

Chapter 19. Requirements for the Repair/Replacement of Failing Systems

When on-site wastewater system repairs are made, the system must be brought into compliance with the provisions specified in the new On-Site Wastewater Systems Ordinance and On-Site Wastewater Manual "…to the maximum extent feasible."

The following guidance outlines how this requirement is to be interpreted; however the EH Director may consider exceptions based on unique circumstances.

A. Whenever a failing onsite wastewater system results in sewage flowing or ponding onto the surface of the ground, immediate action such as pumping the septic tank must take place within 24 hours if feasible and in no case longer than 48 hours. In addition, the homeowner needs to be advised to immediately reduce to a minimum their use of water in order to reduce wastewater loading of the system.

B. Any on-site wastewater system that has been permitted by this office will not be required to upgrade to current standards as long as the system does not fail, resulting in backup of sewage into the structure being served or surfacing sewage.

C. Septic Tank

1. Upgrade to current tank capacity standards[12] will be required when either:
    a. The existing tank is significantly undersized, substandard in construction, or located with inadequate setbacks to prevent maintenance; or
    b. The existing tank is found to be leaking.

12 Current standards require a 1,500 gallon septic tank for up to a 4-bedroom residence and an additional 200 gallons for each bedroom thereafter.

2. Existing septic tanks will be considered significantly undersized and must be brought up to current standards when the tank volume is less than the minimum volume shown in the following table:

Number of Bedrooms	Minimum Tank Volume(gallons)
1	750
2-4	1,000
5	1,250
6	1,500

3. Mobile Home Park Community Systems: When determining whether a septic tank needs to be upgraded, based on volume considerations, the following design factors need to be considered by staff:

   a. Actual and potential daily wastewater volume:

      - Design flow (250 gpd/mobile home)
      - Number of bedrooms
      - Occupancy

   b. Generally, two mobile home units are the most that can be allowed to be served by a single 1,000 gallon septic tank.

4. Wooden, leaking, or deteriorating tanks will need to be replaced due to concerns about structural integrity, substandard construction, and potential leakage. **Note**: Wooden tanks identified through routine septic pumping will be considered substandard and require replacing with an approved tank as specified in the On-Site Wastewater Manual.

5. The LEA will not authorize installation of a wooden cover on a septic tank due to the inability of the replacement lid to be watertight and have the needed structural integrity to be safe. On a case-by-case basis, the LEA may consider approval of an engineered concrete top replacement for a concrete septic tank, provided the tank is not located in an area with high seasonal groundwater.

6. Leaking clamshell septic tanks may be sealed rather than replaced, provided:

   a. The work is performed by a Certified Installer;

   b. The Certified Installer notifies the LEA as provided in the On-Site Wastewater Ordinance;

   c. The Certified Installer completes and submits to the LEA an As-Built on the form provided by the LEA that verifies that the 24-hour leak test was performed and the tank did not leak; and

7. Septic tank leak testing will be required for all septic system repairs, except this requirement may be waived by the LEA for existing septic tanks serving occupied dwellings when the following conditions are met:

    a. The tank is pumped and observed to be in good structural condition; and

    b. The tank is not located in an area with high watertable.

C. Test Hole Analysis

Soil test holes will be required for determining dispersal field size and depth except when soil records in the files are sufficiently detailed and complete for determining optimal dispersal field size and depth. In order to meet this requirement, soil log data must be from a location in proximity to the proposed dispersal field and recorded in sufficient detail to determine application rate and depth to a restrictive layer, if present.

D. Guidance for Requiring a Certified Designer

1. Some parcels requiring wastewater system repair have one or more site constraints making design of the replacement system challenging and more complex. Site constraints could be due to parcel size, location of existing structures, landscaping features, and site characteristics requiring setbacks.

2. When the LEA believes site constraints are of such a serious nature as to require the use of a Certified Designer, the property owner will select a Certified Designer to assist with evaluating the site and designing the replacement wastewater system.

3. Unless an exemption is granted by the Environmental Health Director or Land Use Manager, the LEA will **REQUIRE** use of a Certified Designer when **BOTH** of the following site constraints apply:

    a. Insufficient useable drainfield area is available for dispersal field sized on the basis of trench bottom area only; and

    b. No additional area is available for future repair after placement of current repair.

4. When parcels have only **ONE** of the two site constraints listed above, but also have one or both of the following additional site constraints: (i.) Less than 12 inches of vertical separation (distance between dispersal field bottom and restrictive layer or seasonal water table) for dispersal field; or (ii.) Receiving soil identified as a Class A, E, (or undesignated), the LEA will meet with the property owner and the Certified Installer to:

    a. Explain to the homeowner the risk and potential cost of future repairs; and

    b. **RECOMMEND** that the homeowner utilize the services of a Certified Designer to design the repair system.

E. Insufficient Useable Drainfield Area

When there is insufficient useable area on a parcel to repair a system using bottom area only for drainfield sizing, the LEA may consider one of the following alternatives:

1. Determining required bottom area using percolation testing;
2. Increasing trench width;
3. Use of a bed instead of trenches;
4. Use of pressurized distribution for a 25% sizing reduction;
5. Use of supplemental treatment and pressurized distribution for a 50% sizing reduction; or
6. Use of sidewall area using the calculations specified in the Manual of Septic Tank Practice.

F. The LEA may require additional design features when there is evidence that a wastewater system sized on the basis of the number of bedrooms alone would be undersized and subject to premature failure. The following table shows the maximum occupancy for a residence when the design flow is based solely on the number of bedrooms:

Number of Bedrooms	Maximum Occupancy	Design Flow (based on 60 gpd/occupant)
2	4	240
3	6	360
4	7	420
5	8	480

G. Use of a Bed in Lieu of Trenches

1. Definition of a "Bed System": A dispersal system is designated a "bed" system or a "seepage bed" when the excavation width exceeds 36 inches. Bed systems may be a viable option for system design when site constraints do not allow placement of a conventional trench system meeting current sizing requirements.

2. Special distribution considerations: To assure that the entire bottom area of the bed will be utilized for dispersal, that treatment by the receiving soil will be maximized, and that localized groundwater mounding will be minimized, bed systems may be required by the LEA to utilize pressurized distribution.

3. Special sizing considerations for bed systems wider than 4 ft: Dispersal systems are sized based on the anticipated quantity of wastewater (design flow) and the capacity of the receiving soil to disperse the wastewater (application rate). Only the bottom area of the dispersal field is used for its sizing. From time to time, however, the design flow may be exceeded for short periods of time. Under such conditions of peak loading, trench sidewall dispersal provides an additional safety

factor for conventional trench systems. Because bed systems have limited sidewall area in relationship to bottom area, bed systems wider than 4 ft need to be increased in size by 50%. If pressurized distribution is utilized the size will only need to be increased by 25% (based on a 50% increase per the UCP, minus the 25% credit for the use of pressurized distribution).

4. Special construction considerations:

   a. Beds should be constructed only when the soil is sufficiently dry so that it will not seal or compact during installation

   b. No excavation equipment, including tracked vehicles, should be used inside of the bed

H. Equal Distribution

1. Equal distribution by appropriate placement of "T"s and distribution boxes will be required within the dispersal field;

2. When site conditions do not allow equal distribution using gravity dispersal, pressurized distribution will be required.

I. Pump and Pressure Distribution

Gravity systems will be required to utilize pumps and pressurized distribution as follows:

1. Utilization of an Effluent Pump: An effluent pump is required when the depth of the plumbing without its use would result in either:

   a. Effluent discharged less than 12 inches above a restrictive layer such as hardpan or a seasonal watertable (as evidenced by mottling or presence of groundwater) and use of the pump would significantly increase the vertical separation, or

   b. The bottom of the dispersal field being deeper than 5 ft below finished grade.

2. Utilization of Pressurized Distribution: Whenever a pump is required for a system repair, as specified in Subsection a, above:

   a. Staff will explain the benefits of using pressurized distribution;

   b. Pressure distribution will only be required when a pump is needed as specified in Subsection 1.a. of this section, and when equal distribution utilizing gravity dispersal is not feasible due to site constraints.

J. Supplemental Treatment

Wastewater systems will be required to utilize supplemental treatment when one of the following conditions has occurred and an alternate remedy is unavailable:

1. The site is located in a designated Area of Environmental Concern and supplemental treatment is specified as a mitigation; or
2. Effluent dispersal is into a soil that is seasonally inundated by groundwater (i.e., 0 vertical separation); or
3. Available area for the dispersal field is significantly undersized based on the daily design flow and application rate of the receiving soil; or
4. The dispersal field will be excavated closer than 50 ft to a down gradient (unlined) surface water or closer than 25 ft to an up-gradient (unlined) surface water; or
5. Wastewater strength is significantly greater than domestic strength.

K. Requirements Pertaining to Minor Repairs Requiring LEA Notification and Plan Review under Section 19-7 D.2. of On-Site Wastewater Ordinance:

1. In general, a minor wastewater system modification or repair that does not require completion of a Site Assessment or soil evaluation, or involves replacement of no more than 10 ft of drainpipe due to crushing or root intrusion does not require a full Construction Permit.
2. No on-site wastewater system components can be serviced or repaired without notifying the LEA for plan review.
3. Other than replacement of septic tank inlet and outlet T's or replacement of septic tank lids, LEA Notification and Plan Review must take place BEFORE the service is performed.
4. LEA staff will make plan review a high priority activity, typically performed by a simple telephone call to the LEA and conversation with an inspector. Photographs sent via email may, at the LEA's discretion, be accepted in lieu of an actual site inspection.
5. When a site inspection is not waived by the LEA, an inspection by the LEA will be performed whenever possible while the installer is on site performing the component replacement or modification and no later than one working day from the date of notification and plan review or else the installer is authorized to complete the work and cover the system.

L. Whenever, in the determination of the LEA, insufficient area will remain for system replacement in the event of failure of the current repair being permitted, the APN file will be clearly flagged with this information and Trakit will be flagged so that the information will be readily accessible by future property owners.