

# STANDARDS FOR THE SITE EVALUATION, DESIGN AND CONSTRUCTION OF ONSITE WASTEWATER TREATMENT SYSTEMS (OWTS MANUAL)

*Effective May 13, 2018*

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## **INTRODUCTION**

The County of El Dorado, Community Development Agency, Environmental Management Division (CDAEMD) is responsible for protecting public health and the environment from the potential adverse health and environmental impacts associated with Onsite Wastewater Treatment Systems (OWTS). This responsibility is carried out through the review of OWTS design proposals, review of design criteria, and inspection of construction of new, and repair of existing, OWTS to determine conformance with applicable codes.

The Standards for the Site Evaluation, Design and Construction of OWTS (OWTS Manual) has been prepared in conjunction with El Dorado County's Local Agency Management Plan (LAMP) to meet the California State Water Resources Control Board OWTS Policy (State OWTS Policy) dated June 19, 2012.

## **SECTION 1 – GENERAL PROVISIONS**

### **SECTION 1A. SITE EVALUATION**

#### **Purpose of Site Evaluation**

The purpose of the site evaluation is to determine whether or not a parcel can accommodate an OWTS. The site evaluation is used to determine soil depths and Groundwater levels when siting and designing OWTS on existing parcels to accomplish the following:

- Protect Groundwater quality by ensuring proper treatment of the sewage Effluent prior to its entering into Groundwater;
- Protect the public health from Failing OWTS caused by high Groundwater; and
- Provide a methodology for the evaluation of potential building sites using OWTS with regard to maintaining minimum Groundwater separation requirements of the adopted State OWTS Policy and ensuring utilization of the most porous or absorptive portions of the soil formation consistent with this Manual.

A site evaluation, CDAEMD site approval, and an OWTS Permit are needed to install, repair, or change an OWTS. The site evaluation is the procedure in which the Qualified Professional and the CDAEMD staff meet at the property and evaluate the site's ability to dispose of sewage during the initial evaluation using Soil Observation Pits. Once the site evaluation is completed, the Qualified Professional will prepare and submit to CDAEMD a site evaluation report.

The site approval is separate from the OWTS construction Permit. The OWTS construction Permit application is the process for obtaining the Permit to work and generally is issued in conjunction with a building permit.

#### **Site Evaluation Process**

The site evaluation for OWTS includes soil test data (soil profile, percolation tests, Groundwater monitoring results, and/or soil boring logs) to determine the soil's ability to treat and dispose of Wastewater. A site evaluation is required for all parcels that will be utilizing OWTS. Only a Qualified Professional may conduct the site evaluation. The Qualified Professional assists the property Owner in locating the appropriate OWTS on the parcel. The Qualified Professional must evaluate the data collected and prepare the site evaluation report.

The soil test data is required to determine the type of system proposed and may be modified depending on the site characteristics. Collection of soil test data is typically required when:

- There is no data available;
- An existing parcel, created prior to test requirements for land divisions, is proposed for development;
- Grading or other soil disturbance has occurred in the previously tested/approved area;
- The system is being shifted out of the previously tested/approved area;
- An OWTS other than the type of system previously approved is being considered; or
- An existing OWTS fails or is proposed for expansion and no previous soil test data is available for the specific parcel.

**Move On Notification Request for Site Evaluation**

The following information shall be on the Soil Observation Pit Move On Notification request:

- Date of the Soil Observation Pit;
- Time Soil Observation Pit ready for inspection;
- Assessor's parcel number and map;
- Parcel size;
- Location map and driving directions;
- Name of Owner/builder/buyer of property;
- Name of Qualified Professional and contact phone number;
- Name of excavator; and
- Project description; i.e., single family residence, parcel split, subdivision, boundary line adjustment, or commercial project.

The Qualified Professional shall notify CDAEMD of the time and date of the scheduled Soil Observation Pits using the Appointment Scheduler on the CDAEMD website. Site evaluations shall be scheduled between 9 a.m. and 4 p.m., Monday through Friday, and shall not be scheduled on recognized El Dorado County holidays.

CDAEMD may require that a parcel be tested for the presence of Groundwater during wet weather, before an OWTS site is approved, based on the presence of soil mottling or gleyed colors in the Soil Observation Pit and/or the presence of hydrophilic vegetation. This requirement may also be set based on historical soils information available for an area.

**Soil Profile - Soil Observation Pits:**

A soil profile is logged using a Soil Observation Pit. The Soil Observation Pit(s) must be located in the proximate area of the proposed Wastewater Disposal Area and must be excavated on each lot. If needed, additional Soil Observation Pit(s) may be required to locate a suitable area for the OWTS, specifically in an area of potential Groundwater, shallow soils, or fractured Bedrock.

The soil profile shall be logged by a Qualified Professional. CDAEMD staff must be present to inspect Soil Observation Pit excavation, unless other arrangements have been made with CDAEMD.

All Soil Observation Pit(s) and deep borings shall have soils described as follows:

- For each pit or deep boring identify the property Owner, pit/deep boring number, the Slope percent of the area of the pit/boring, the date logged, and the Qualified Professional logging the pit/boring;
- All pit or deep boring logs, including failing pits/borings, are to be submitted to CDAEMD for review; and
- Within each pit/boring, from the surface to bottom of the excavation, the following is to be provided for each horizon:
  - Depth within the pit/boring;
  - Color(s);
  - Amount (by percent) and size of gravels;
  - Soil texture;
  - The number, size, and prominence of soil mottles, where present;
  - Soil structure;
  - Consistency; and
  - Boundary thickness between horizons.

**Percolation Test Hole Procedures:**

The location of the percolation test holes should be evenly distributed horizontally in the proposed leaching area. A minimum of four (4) percolation tests representative of the dispersal area shall be conducted on each proposed dispersal area. Deep trench designs shall be tested at varying depths for proper evaluation of soil.

Depth of Percolation Test Holes: Percolation test-hole depth shall be representative of the proposed Dispersal System or one (1) foot for systems such as an at-grade or drip Dispersal System. For each lot of proposed land divisions, two to three tests are to be conducted at a depth of three (3) feet and the remainder at a depth of one (1) foot.

Conditions which may require percolation testing deeper than dispersal depth include:

- Consolidated rock or suspected impervious soil layers beneath the site;
- Slopes exceeding 30%; or
- Other factors as might be determined by sound site evaluation practices.

Location of Percolation Test Holes: Percolation test holes shall be excavated in the area representing the proposed location of the Dispersal System or within an expected proposed Disposal Area of a proposed parcel to be created by a land division. Percolation tests shall be conducted in soils suitable for dispersal of Effluent that otherwise meet soil depth and Groundwater depth for the type of system proposed for construction. Test holes shall be representative of the dispersal area demonstrating site conditions throughout the entire OWTS or proposed sewage dispersal area (land divisions) with equal consideration of primary and reserve Dispersal Systems.

Identification of Percolation Test Holes: When specifically requested, locations are to be staked and flagged so the test-hole locations can be located. They are to be identified as to location on the site plan with:

- A test hole number or letter;
- Depth of the test hole; and
- Proposed lot/parcel number or letter if associated with a subdivision or other land use project requiring soil testing.

Percolation Test Holes shall be constructed as follows:

- Diameter of percolation test holes shall be a minimum of six (6) inches. If a shallow backhoe excavation is used, a percolation test hole at twelve (12) to fourteen (14) inches in depth shall be excavated into the bottom of the backhoe bucket trench (the bottom of the percolation hole within this trench is to be at the percolation test-hole depth required for the project);
- Scarify the sides and bottom of the holes, as needed, to remove the soil surface areas that became smeared by the auger or other tool used to excavate the hole;
- Remove as much loose material as possible from the hole; and
- Add two (2) inches of clean pea gravel to protect the bottom from scouring.

Presoaking the percolation test holes shall be conducted as follows:

- Fill the test hole with a minimum of twelve (12) to fourteen (14) inches of clear water over the gravel or to the ground surface in shallower test holes;
- Refill the test hole as needed or otherwise maintain clear water in the hole for a minimum of four (4) hours. After four (4) hours, allow the water column to drop overnight. Testing must begin twenty-four (24) hours after water was first added to the hole; and
- To prevent sloughing of the sidewall in unstable soils, hardware cloth, perforated pipe or other rigid liner may be used.

Additional tests may be required on a site specific basis for reasons that include the following:

- Unacceptable or failed tests;
- Areas of the dispersal field requiring defined limits for exclusion;
- The dispersal field is located out of a concentrated area;
- Soil conditions are variable or inconsistent; or
- To verify suitable soil permeability beneath the chosen leach field depth.

#### **Percolation Rate Determination**

Depending on the soil type and permeability, and the results of the presoak, variations in the procedures used for determining percolation rates can be allowed. The time interval for readings shall reflect the actual times and shall be maintained as near as possible to the intervals outlined for the test (i.e. ten (10) or thirty (30) minutes). Testing shall proceed based on the conditions outlined in the following cases:<sup>1</sup>

Case 1. Water remains overnight in the test hole following initiation of the twenty-four (24) hour presoak.

- Adjust the depth of water over the gravel to six (6) inches.
- Measure the drop in the water level over a single thirty (30) minute period and calculate the percolation rate.

Case 2. No water remains twenty-four (24) hours after the presoak period was initiated.

- Begin the test twenty-four (24) hours after presoak was initiated.
- Fill the hole with six (6) inches of water over the gravel. If, after the first two fillings, the water column seeps away in less than thirty (30) minutes go to Case 3.

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<sup>1</sup> In all three of these cases, readings shall be taken from a fixed reference point and shall be accurate to one-sixteenth (1/16) of an inch.

- If water remains after thirty (30) minutes complete the test by adjusting the water depth to six (6) inches over the gravel and record the drop at the end of every thirty (30) minute period.
- Including the first two (2) readings above, continue the readings and refilling every thirty (30) minute interval for four (4) hours.
- The last water level drop is used to calculate the percolation rate.

Case 3. No water remains in the hole after the first two (2) thirty (30) minute periods.

- Refill the test hole to six (6) inches above the gravel.
- Record the water level drop at ten (10) minute intervals for a period of one (1) hour, refilling to the six (6) inch depth after each reading.
- The last water level drop is used to calculate the percolation rate.

Measurements to the nearest one-sixteenth (1/16) inch should be adjusted to the slowest rate. For example, a reading observed between three-eighth (3/8) inch and five-sixteenth (5/16) inch which yields a range of 80 minutes per inch (MPI) to 96 MPI would be reported 96 MPI.

Percolation Rates - Calculation Examples:

For a thirty (30) minute time interval with 0.75 inch drop:

$$30 \text{ min}/0.75 \text{ inc} = 40 \text{ min/inc}(MPI)$$

For a ten (10) minute interval with a two (2) inch drop:

$$10 \text{ min}/2 \text{ inc} = 5 \text{ min/inc}(MPI)$$

Special Considerations for Percolation Rates:

- Percometer devices are encouraged and are required when conducting tests greater than sixty (60) inches below the ground surface.
- Reports shall be signed with an original signature from the Qualified Professional who either performed or supervised the testing.
- Qualified Professionals who employ technicians are responsible for the work performed by the technician. It is incumbent upon the Qualified Professional to properly train, equip, and supervise anyone performing work under his or her direction and license.
- The percolation test is only one of several critical factors in siting an OWTS. Site considerations may require special evaluation by a Qualified Professional to technically address issues such as high Groundwater, steep Slope, nitrate impacts, and cumulative impacts such as mounding and loading.

#### **Groundwater Monitoring – Determination Required**

The end result of Soil Observation Pit(s) or soil borings is to have knowledge of the useable soil depth and depth to Groundwater at the site. However, it is not always possible to determine the depth to seasonal Groundwater by observing soil pits or borings alone. When the highest anticipated depth to Groundwater cannot be determined with the use of Soil Observation Pit(s) or soil borings, CDAEMD may require Groundwater monitoring wells to be installed to determine the highest anticipated depth to Groundwater. Groundwater monitoring wells may be indicated if the following conditions exist:

- Vegetation tolerant of, or indicative of, a high Water Table present or in the vicinity of the parcel;
- High Groundwater has previously been found in the vicinity;
- Other conditions or historical data preclude accurate determination of the Groundwater levels;
- The Soil Observation Pit indicates less than five (5) feet of the dispersal material over an impervious stratum, or eight (8) feet for lots less than one acre or for community leach fields; or
- Free water from seepage is observed in the Soil Observation Pit.

The height of the seasonal high Groundwater shall be determined by actual measurements of observation wells during periods of maximum soil moisture content, after sufficient precipitation has occurred to meet or exceed field capacity of the soil, and produce a response in observation wells acceptable to CDAEMD.

Groundwater Monitoring - Direct Observation:<sup>2</sup>

- All of the testing shall be done by, or under the supervision of, a Qualified Professional.
- Standard OWTS are not permitted where Groundwater levels are less than five (5) feet below ground surface.
- The Groundwater measurements shall be taken at the time and intervals specified by the CDAEMD in response to local conditions.
- Except as otherwise directed, measurements shall be taken at monthly intervals from January 1 to April 30.
- At least one (1) observation well shall be included within each proposed dispersal area suspected of having Groundwater less than five (5) feet below the ground surface, except where a nearby monitoring well shows Groundwater contours representative of the proposed dispersal area. Observation well construction guidance is provided in next section.
- If Groundwater levels are less than five (5) feet during any observation, weekly observations shall be recorded throughout the remainder of the wet weather season to ensure that the standards are not exceeded for longer than any two-week period.
- The depth to Groundwater shall never be less than two (2) feet on any observation.
- If seasonal rainfall up to the April 30 cutoff date has not exceeded 80% of the normal rainfall, as determined by the nearest rainfall reporting station approved by the CDAEMD, during the period from December 1 to April 30, testing shall be continued the next year. However, CDAEMD may accept monitoring in years with less than the required amount of rainfall as long as the results appear to represent the highest Groundwater depth for the site.
- Results of all percolation tests and Groundwater monitoring shall be reported and the logs of all excavations shall be submitted to CDAEMD. They shall be accompanied by a plot plan to scale showing the test, well, and pit locations. The map shall include five (5) foot contour intervals. Logs or tests that do not appear to represent soil condition at the parcel may be rejected by CDAEMD.

**Observation Well Construction Guidelines**

Observation wells, for OWTS purposes, are typically completed as follows:

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<sup>2</sup> Lots less than one (1) acre in size or community dispersal fields shall be evaluated using either direct observation or using Soil Analysis.

- Soil Observation Pit(s) are converted to observation wells by placing a perforated pipe into the pit prior to backfilling with native soil; or
- A hole is drilled or bored to a desired depth, a perforated pipe is placed into the hole, clean pea gravel is placed around the perforated pipe, and a surface concrete seal is placed.

Observation well construction materials specifications:

- Pipe perforations will be engineered slots, rather than drilled holes;
- Filter fabric will be used to cover the perforations in Soil Observation Pit(s);
- Use of solid pipe for the upper two (2) feet of the well is required;
- A minimum of twelve (12) inches of concrete will be placed on the upper annular space of drilled/bored wells;
- A minimum two (2) mil plastic sheet may be draped over entire excavated area of a soil pit used as a monitoring well to exclude direct access of surface water into the backfilled pit; and
- At no time is a pit or bored/drilled hole to extend through a restrictive layer.

#### **Soil Analysis Alternative to Direct Observation**

As an alternative to direct observation, an application may be submitted to CDAEMD for individual evaluations utilizing conditions associated with saturation. Conditions associated with saturation include:

- Reddish brown or brown soil horizons with gray (chromas of three or less) and/or red or yellowish red mottles;
- Gray soil horizons, or gray soil horizons with red, yellowish red, or brown mottles;
- Dark-colored highly organic soil horizons; or
- Soil profiles with concentrations of soluble salts at or near the ground surface.

If conditions associated with saturation do not occur in soil with rapid or very rapid permeability, saprolite, or fractured Bedrock, prediction of the highest level of the Water Table shall be based on direct observations.

- Soil with rapid or very rapid permeability is defined as follows:
  - Soil which contains 35% or more of coarse fragments two (2) millimeters in diameter or larger by volume with interstitial soil of sandy loam texture or coarser;
  - Coarse textured soil (loamy sand or sand as classified in a Soil Textural Classification Chart); or
  - Stone, cobbles, gravel, and rock fragments with too little soil material to fill interstices larger than one (1) millimeter in diameter.
- Saprolite means weathered material underlying the soil that grades from soft thoroughly decomposed rock to rock that has been weathered sufficiently so that it can be broken in the hands or cut with a knife. It does not include hard Bedrock or hard fractured rock. It has rock structure instead of soil structure.

#### **SECTION 1B. OWTS SITE EVALUATION REPORT AND SITE PLANS**

The OWTS Site Evaluation Report shall include a site plan, percolation report, design calculations, and four (4) legible copies of the OWTS design. A copy of grading plan shall also be included when required by CDAEMD. The design shall be on a scale not exceeding one (1) inch to fifty (50) feet and shall be not smaller than standard letter sized paper (8 ½ inches by 11 inches). (NOTE: Design will not be accepted drawn on the grading plan or topographic contour map).

A Site Evaluation Report that details test procedures and results shall include the following:

- Current Assessor's parcel number of property;
- The Person who performed the test, his/her address, zip code, phone number, title, registration number, and signature;
- Weather conditions, time, and temperature at time of test;
- Water source;
- The number of Bedrooms in the existing or proposed structure(s), or number of fixture units if other than Single Family Dwelling;
- The location of test holes on a plot map. Include the contours or direction of Slope of the land; location of lakes or streams, outcrops, existing or proposed structures, or wells; location and approximate height of road Cuts, if any, and location and type of surface vegetation;
- Depth and soil profiles of each hole;
- All percolation rate measurements taken and stabilized percolation rate. Report the percolation measurements and rates as minutes per inch (the minutes required for the water to drop one (1) inch in a six (6) inch hole);
- Description of soil profile in the leach field area, including roots, clay lenses, rock type and amount, texture, moisture, depth to Groundwater, and other unusual aspects;
- Soil description as per the USDA soil survey of El Dorado County;
- Site plan; and
- Any special considerations required in the installation of the proposed OWTS.

The site plan shall have following information:

- The outline and dimensions of the parcel;
- A north arrow and scale;
- Proposed project details including exact length, width, and depth of leach lines (include cross section of trench). (NOTE: designs cannot be deeper than 6 inches of the deepest percolation test hole, but can be shallower);
- Location of 100% / 300% Replacement Area;
- Percent of Slope of the ground in the OWTS Disposal Area and the 100% / 300% Replacement Area. (All development of a parcel shall reserve areas that are less than 30% Slope for Wastewater disposal, unless a Slope stability report is provided by a Qualified Professional);
- Location of land features that may affect the proposed OWTS Dispersal Area(s) (i.e. drainage courses, wet areas, Cut banks, waterways, water bodies, seasonal or dry creek beds, and Slopes greater than 30%);
- Local geology including significant rock outcrops, cuts, and fills;
- All roads and driveways shown and labeled, including length, width, turn radius, and estimated grade;
- Frontage road and all easements pertaining to the property, which may affect the siting of OWTS;
- Dimensions, square footage, footprint, and use of all structures, including mobile homes or houses, attached garage(s) or any other structures on the parcel including proposed structures, retaining walls, and pools;
- All OWTS and well locations, both existing and proposed. Also show the distance to all neighboring OWTS and well(s); and
- Locations of all percolation tests, soil profile pits, borings, and Groundwater monitoring well, if applicable.

Additional information may be requested for a proposed OWTS based on specific site features or conditions.

The Site Evaluation Report is transferable and runs with the land. The report is based upon property conditions at the time of the site evaluation. Changes made to the property after the site evaluation may render the proposed designated OWTS area unacceptable. Examples of types of changes include: grading, cuts and fills, new buildings, wells, ponds, etc. The property Owner must take care not to encumber or alter the designated area in a manner that affects the future OWTS. Changes in statutes governing OWTS may also necessitate modifications to the site evaluation reporting requirements.

**SECTION 1C. PARCEL CREATION**

For new parcel creation a Site Evaluation Report for each proposed parcel shall be completed for submittal to CDAEMD. Site evaluations shall be scheduled to include CDAEMD in the process.

Suitable OWTS Disposal Areas shall be shown on a tentative parcel or subdivision map. Suitable OWTS Disposal Areas shall meet all the requirements for a Standard OWTS or Special Design OWTS, with or without Supplemental Treatment, and shall be located such that there is no conflict with any other applicable County requirements, including those contained in the El Dorado County General Plan.

The size of available OWTS Disposal Area shown on each proposed parcel shall correspond to Table 1:

<b>Table 1. Minimum Disposal Area Based on Percolation Rate</b>	
<b>PERCOLATION RATE (minutes/inch)</b>	<b>MINIMUM DISPOSAL AREA (square feet)</b>
Less than 10	6,000
11-20	8,000
21-40	10,000
41-60	12,000
61-80	14,000
81-100	16,000
101-120	18,000
Over 120	Not suitable for development

Each parcel shall contain one (1) or more Disposal Areas, each consisting of minimum area as shown in Table 1 with useable soil in locations which could reasonably be utilized by a structure built at a desirable location and feasible site.

OWTS receiving a projected flow over 10,000 gallons per day must be referred to California Regional Water Quality Control Board, Central Valley Region (RWQCB) for waste discharge requirements.

## SECTION 1D. MINIMUM PARCEL SIZE

The average density for any subdivision of property, made by approval of a tentative map pursuant to the Subdivision Map Act, and occurring after the effective date of this OWTS Manual, shall not exceed the allowable density values in Table 2 for a single family Dwelling unit, or its equivalent, for those units that rely on OWTS.

AVERAGE ANNUAL RAINFALL	ALLOWABLE DENSITY (acres/Single Family Dwelling unit)
0 - 15	2.5
>15 - 20	2
>20 - 25	1.5
>25 - 35	1
>35 - 40	0.75
>40	0.5

## SECTION 1E. REVISIONS

The Qualified Professional shall approve all revisions to approved site plans. Major revisions require a new site plan reviewed and approved by CDAEMD. Some of the major revisions include: relocating the Disposal Area a significant distance from the approved OWTS area; changes in trench depth and width or type of OWTS; and changes in media used in the trenches.

Minor Revisions that do not require a new site plan include change in tank or distribution box locations or adjustments to the leach lines for contour or obstructions when those changes are within the approved OWTS area. Any changes must meet all other requirements, including setbacks.

## SECTION 1F. APPLICATION PROCESS

After the site evaluation has been conducted and the Site Evaluation Report has been reviewed by CDAEMD, an application for an OWTS construction Permit must be submitted to CDAEMD for approval. All OWTS construction Permit applications for new installation, repair, replacement, addition, or expansion of OWTS within El Dorado County will be submitted to CDAEMD with the appropriate fees. The application form shall identify the location of the property, Owner, Owner's authorized representative, Contractor, proposed use, parcel size, specific assessor parcel number, and proposed water supply for the proposed project. The application shall identify any previous land use projects that may have required that soil testing be conducted. The application shall also identify the OWTS project as a new installation, repair, replacement, addition, or expansion. A complete OWTS Permit application shall include the Site Evaluation Report. A Permit will only be issued to an Owner or the Owner's authorized representative.

## **SECTION 1G. INSPECTIONS**

### **Installation Inspections**

Inspections for the installation, replacement, repair, or expansion of OWTS shall only be performed under a valid Permit. The Permit number shall be provided when an inspection is requested. The OWTS shall be accessible and ready for the type of inspection requested. If extra inspections are needed, additional inspection fees may be charged.

### **Open Trench Inspections**

After obtaining an approved OWTS construction Permit to install, repair, replace or expand an OWTS, an open trench inspection shall be performed by the Qualified Professional on all OWTS. The Qualified Professional shall sign the CDAEMD stamp on the site plan indicating that he/she has conducted the open trench inspection and that it complies with his/her design specifications. (NOTE: this does not preclude the Qualified Professional from performing additional inspections, as he/she deems necessary). At the time of the open trench inspection, all the following shall be completed:

- All excavations necessary for the OWTS at designed depth, width, and length;
- All smeared or compacted surfaces shall be scarified;
- Bottom of the trenches shall be level; and
- Minimum setbacks shall be in accordance with the approved site plan.

### **Final Inspections**

Final inspections shall be performed by CDAEMD on all OWTS within two (2) weeks of the open trench inspection. The as-built design site plan and necessary paperwork shall be available on site at the time of the scheduled inspection. A final inspection will only be conducted after the Qualified Professional and the Contractor have signed the approved site plan. The site plan shall show all revisions. At the time of final inspection, all the following shall be completed:

- Trenches filled with rock or Medium specified in the design to the specified level with the filter material in place or gravel-less chambers shall be installed;
- Approved distribution boxes, with covers, installed level on undisturbed soil and at the proper elevation. Sealing around pipe is also to be completed;
- All pipe, other than in leach lines, installed on undisturbed soil (1/8 in/ft. minimum drop), and grouted at tank and distribution boxes;
- The Septic Tank set level in place on undisturbed soil. A layer of approved bedding material may be used;
- All trenches shall be left uncovered to the filter material and visible for inspection - do not backfill unless the filter material cannot be installed in multiple trench designs. When necessary, portions of the trenches may be backfilled with the soil cover to access other trenches. A minimum of ten (10) feet at the ends of the trenches must be left uncovered. The Contractor may have to uncover portions of the trench at the direction of the CDAEMD; and
- Observation risers shall be installed in every leach line.

## **SECTION 1H. PROHIBITIONS**

Pursuant to the State OWTS Policy, the following will not be authorized:

- Cesspools of any kind or size;
- Wooden Septic Tanks;

- OWTS receiving a projected flow over 10,000 gallons per day;
- OWTS that utilize any form of Effluent dispersal that discharges on or above the post installation ground surface such as sprinklers, exposed drip lines, a free-surface wetlands, a pond, or any other similar surface discharge;
- Slopes greater than 30% without a Slope stability report approved by a Qualified Professional;
- Decreased leaching area for International Association of Plumbing and Mechanical Officials (IAPMO) certified Dispersal System using a multiplier less than 0.70;
- OWTS utilizing Supplemental Treatment without an Operating Permit specifying requirements for periodic monitoring or inspections;
- OWTS dedicated to receiving significant amounts of wastes dumped from recreational vehicle holding tanks; and
- Separation of the bottom of Dispersal System to Groundwater less than two (2) feet, except for seepage pits, which shall not be less than ten (10) feet.

Installation of new or replacement OWTS where public sewer is available will not be permitted in El Dorado County; however, the public sewer may be considered unavailable when such public sewer or any building or exterior drainage facility is located more than two hundred (200) feet from any proposed building or exterior drainage facility on any lot or premises that abuts and is served by such public sewer. In addition, this provision will not apply to replacement OWTS where the connection fees and construction costs are greater than two (2) times the total cost of the replacement OWTS and the CDAEMD determines that the discharge from the OWTS will not affect Groundwater or surface water to a degree that makes it unfit for drinking or other uses.

## **SECTION 11. ENFORCEMENT**

Enforcement Actions: As provided for in Ordinance Chapter 110.32, when a violation occurs, CDAEMD may exercise enforcement action in any or all of the following manner(s):

1. Issue a written notice of inspection, correction notice, stop work order, or permit suspension; decline to renew a permit; revoke a permit; deny a permit; and/or record a notice of non-compliance with the County of El Dorado Recorder Clerk's Office.
2. Impose administrative citations and fines or seek summary abatement pursuant to Chapter 9.02. The Director may serve as the "Enforcement Officer" for purposes of administrative enforcement under Chapter 9.02.
3. Seek reimbursement for the necessary and actual costs incurred to mitigate the threat of contamination and to protect the health and safety of the public pursuant to California Health and Safety Code section 5412.5.
4. Refer the violation to the office of the district attorney for enforcement of any criminal penalty or penalties in accordance with Chapter 1.24.

Enforcement Action Procedures:

- **Notice of Inspection:** CDAEMD may direct the cessation or correction of a violation or a public health hazard. The notice will direct immediate measures required to eliminate a potential or actual public health hazard or a public nuisance. Failure to comply with the requirements of a Notice of Inspection is a violation of the terms of the OWTS Manual, and is subject to any or all of the enforcement actions prescribed in County Ordinance Code.

- Correction Notice: CDAEMD may issue a Correction Notice upon a Person responsible for working on an OWTS or operating an OWTS where that work or operation is in violation of the terms of the OWTS Manual or County Ordinance Code and/or conditions of a Permit. The Correction Notice will state the violation(s). Failure to correct the stated violation(s) is a violation of the terms of the OWTS Manual and is subject to any or all of the enforcement actions prescribed in County Ordinance Code.
- Stop Work Order: CDAEMD may issue a Stop Work Order for work that is in violation of the terms of the OWTS Manual, County Ordinance Code, an OWTS Permit, or is occurring in an unsafe and dangerous manner. The Stop Work Order will be issued to the Person responsible for the work and will specify the reason for the Stop Work Order. It may also direct corrective measures necessary to abate the violation. Work may only recommence upon written release by CDAEMD. Failure to comply with the requirements of a Stop Work Order is a violation of the terms of the OWTS Manual and is subject to any or all of the enforcement actions prescribed in County Ordinance Code.
- Permit Suspension:
  - Construction Permit: A construction Permit issued by CDAEMD is valid for a two (2) year period. CDAEMD may suspend a construction Permit when the construction of an OWTS is in violation of the terms of the OWTS Manual, County Ordinance Code, or conditions of a Permit or where a Person has misrepresented any material fact in the application for a Permit. CDAEMD will provide the Owner a written notice of intent to suspend a Permit. The Owner will be given the opportunity to request a hearing with CDAEMD. Within ten (10) working days of the written notice of suspension, CDAEMD must receive a written request for a hearing. Failure to request the hearing within the ten (10) working days is deemed a waiver of the right to a hearing. CDAEMD will schedule a hearing within ten (10) working days from the receipt of a written request for a hearing. The Director of CDAEMD or designee shall conduct the hearing. The decision resulting from the hearing may be appealed in accordance with El Dorado County Code Chapter 110.12. No work may continue on an OWTS where the Permit has been suspended. Work on an OWTS with a suspended Permit may recommence upon reinstatement of the Permit in writing by CDAEMD. Before the Permit will be reinstated, any hourly fees pending shall be paid in full.
- Operating Permit:
  - An Operating Permit is valid for one (1) year. Failure to pay the required fee or submit the specified monitoring and inspection information, or failure to undertake any required corrective work specified by CDAEMD, may be cause for issuance of a citation, penalty fees, non-renewal and/or revocation of the operating permit by CDAEMD and referral to the RWQCB.
  - The RWQCB may require the owner of the OWTS to submit a report of waste discharge for evaluation on a case-by-case basis. RWQCB response to such reports of waste discharge may include, but is not limited to, enrollment in general waste discharge requirements, issuance of individual waste discharge requirements, or issuance of waiver of waste discharge requirements.

## SECTION 2 – DESIGN PROCEDURES

### SECTION 2A. GENERAL REQUIREMENTS

The following are general requirements for all OWTS. Additional design requirements for Special Design OWTS are provided in Section 2C and for Supplemental Treatment in Section 2D.

Wastewater from bathrooms, kitchens, laundry fixtures, and other household, commercial, or industrial plumbing shall pass through a septic or other approved sedimentation tank prior to its discharge into a disposal field.

**Location**

No private OWTS, or part thereof, shall be located on any lot other than the lot which is the site of the building or structure served by such private OWTS; nor shall any private OWTS or part thereof be located at any point having less than the minimum setback distances indicated in the OWTS Manual.

Nothing contained in this Manual shall be construed to prohibit the use of all or part of an abutting lot to provide additional space for a private OWTS or part thereof, when a valid transfer of ownership or change of boundary has been first established to the satisfaction of the Director or under circumstances where a recorded easement may be used. The instrument recording such action shall constitute an agreement with the CDAEMD which shall clearly state and show that the areas so joined or used shall be maintained as a unit during the time they are so used. Such agreement shall be notarized and recorded in the office of the El Dorado County Recorder Clerk as part of the conditions of ownership of said properties. A copy of the recorded document shall be filed with the CDAEMD.

**Replacement Area**

All single family residential OWTS , the OWTS shall be designed such that they include the equivalent replacement area of at least 100 percent (100%) of the required original system. No division of the lot or erection of structures on the lot shall be made if such division or structure impairs the usefulness of the 100% replacement area.

Commercial, agricultural, industrial, multifamily, recreational, and mobile home park projects shall require a minimum of 300 percent (300%) replacement area. No division of the lot or erection of structures on the lot shall be made if such division or structure impairs the usefulness of the 300% replacement area.

**Septic Tank Capacity**

Septic Tanks shall be sized following the specifications in Table 3 or based on the most recent version of the California Plumbing Code (CPC).

<b>TABLE 3. SEPTIC TANK CAPACITY<sup>1</sup></b>			
<b>SINGLE FAMILY DWELLING- NUMBER OF BEDROOMS</b>	<b>MULTIPLE DWELLING UNITS OR APARTMENTS- ONE BEDROOM EACH<sup>2,3</sup></b>	<b>OTHER USES- MAXIMUM FIXTURE UNITS SERVED<sup>4</sup> (PER TABLE 702.1 OF THE 2016 CALIFORNIA PLUMBING CODE)</b>	<b>MINIMUM SEPTIC TANK CAPACITY IN GALLONS</b>
1-2	--	15	1000 <sup>5</sup>
3	--	20	1000

4	2 units	25	1200
5 or 6	3	33	1500
--	4	45	2000
--	5	55	2250
--	6	60	2500
--	7	70	2750
--	8	80	3000
--	9	90	3250
--	10	100	3500

<sup>1</sup>Septic Tank sizes in the table include sludge capacity and the connection of domestic food waste disposal units without further volume increase.

<sup>2</sup>Extra Bedroom, one hundred-fifty (150) gallons each.

<sup>3</sup>Extra Dwelling units of greater than ten (10): two hundred-fifty (250) gallons each.

<sup>4</sup>Extra fixture units over 100: twenty-five (25) gallons each.

<sup>5</sup>CPC requires a minimum of 750 gallon septic tank; El Dorado County requires a minimum 1,000 gallon septic tank.

**Septic Tank Design Minimum Requirements**

- The liquid capacity of all Septic Tanks shall conform to Table 3 or by the number of plumbing fixture units as determined from the California Plumbing Code, whichever is greater;
- Plans for all Septic Tanks shall be submitted to CDAEMD for approval. Such plans shall show all dimensions, reinforcing structural calculations, and such other pertinent data as may be required;
- Septic Tanks shall be designed to produce a clarified Effluent consistent with accepted standards and shall provide adequate space for sludge and scum accumulations;
- Septic Tanks shall be structurally designed to withstand all anticipated earth or other loads;
- Septic Tank covers shall have watertight risers, the tops of which shall be set at a minimum of six (6) inches below finished grade and capable of supporting a load of not less than three hundred (300) pounds per square foot or access openings at grade or above shall be locked or secured to prevent unauthorized access.
- Fiberglass and polyethylene Septic Tanks must be certified by a Qualified Professional;
- Septic Tanks shall be constructed of solid durable materials, not subject to excessive corrosion or decay and shall be watertight;
- Septic Tanks shall have a minimum of two (2) compartments. The inlet compartment of any Septic Tank shall be not less than two-thirds (2/3) of the total capacity of the tank and shall be at least three (3) feet in width and five (5) feet in length. Liquid depth shall not be less than two (2) feet, six (6) inches, or more than six (6) feet. The secondary compartment of any Septic Tank shall have a maximum capacity of one-third (1/3) of the total capacity of such tank. In Septic Tanks having over fifteen hundred (1,500) gallons capacity, the secondary compartment may be not less than (5) feet in length;
- Access to each Septic Tank shall be provided by at least two (2) manholes twenty (20) inches in minimum dimension or by an equivalent removable slab cover. One access manhole shall be located over the inlet and one access manhole shall be located over the outlet. Wherever a first compartment exceeds twelve (12) feet in length, an additional manhole shall be provided over the baffle wall;

- The sidewalls shall extend at least nine (9) inches above the liquid depth. The cover of the Septic Tank shall be at least two (2) inches above the back vent openings;
- Partitions or baffles between compartments shall be of solid durable material and shall extend at least four (4) inches above the liquid level. An inverted fitting equivalent in size to the tank inlet, but in no case less than four (4) inches in size, shall be installed in the inlet compartment side of the baffle with the bottom of the fitting placed midway in the depth of the liquid. Wooden baffles are prohibited; and
- Alternate construction materials shall be approved by the CDAEMD.

**Disposal Field Area**

Pursuant to the State OWTS Policy, the minimum depth to the anticipated highest level of Groundwater below the bottom of the leaching trench, and the native soil depth immediately below the leaching trench, shall not be less than the following:

<b>Table 4. Minimum Soil Depth Based on Percolation Rate</b>	
<b>PERCOLATION RATE</b>	<b>MINIMUM DEPTH</b>
Percolation Rate 1 to 5 MPI	Twenty (20) feet
Percolation Rate >5 to 30 MPI	Eight (8) feet
Percolation Rate >30 to 120 MPI	Five (5) feet

- Effective Soil Depth shall be five (5) feet below the bottom of the design depth; and
- Depth to Groundwater shall be a minimum of five (5) feet below the bottom of the design depth.

**Commercial Facilities:**

- Projected daily flows for Commercial Facilities shall be estimated using the CPC. CDAEMD may approve, on a case-by-case basis, metered water use data or other reliable supporting data in lieu of the estimated Wastewater flows in the CPC;
- Commercial facilities that prepare foods, (e.g., kitchens, restaurants) shall install a grease trap or interceptor pursuant to the most recent County adopted edition of the CPC and amendments thereto unless an acceptable alternative is recommended by a Qualified Professional and approved by CDAEMD;
- OWTS with Wastewater flows exceeding 10,000 gallons per day will be referred to the RWQCB for approval; and
- Other reliable projected daily flows may be approved by the CDAEMD upon submission of supporting data and calculations.

**Disposal Field - Design Requirements**

A standard disposal field is considered to be three (3) feet wide and three (3) feet deep with a length as required. A non-standard leach line is wider, narrower, and/or deeper than three (3) feet with a length as required.

**Disposal Field Sizing**

- Standard and deep trench systems shall be sized using the following:

**Table 5. Allowable rate of sewage application to a soil absorption system**

PERCOLATION RATE (time in minutes for water to drop one-inch)	MAXIMUM RATE OF SEWAGE APPLICATION (gallons per square foot per day) <sup>1</sup> for adsorption trenches, <sup>2</sup> seepage beds, and seepage pits <sup>3</sup>
1 or less	5.0
2	3.5
3	2.9
4	2.5
5	2.2
10	1.6
15	1.3
30	0.9
45	0.8
60 <sup>4</sup>	0.6

<sup>1</sup>Not including Effluent from Septic Tanks that receive wastes from garbage grinders.

<sup>2</sup>Absorption Area is figured as trench bottom area and includes a statistical allowance from vertical sidewall area.

<sup>3</sup>Absorption Area for seepage pits is effective sidewall area.

<sup>4</sup>Percolation rates other than those listed up to 120 MPI use: 5 divided by the square root of the percolation rate.

Example 1 – Absorption trenches:

Amount of Wastewater for disposal = 2,000 gallons per day;

Percolation rate is 1-inch in five (5) minutes; and

From Table 5 the maximum rate of sewage application is 2.2 gallons per square foot per day.

$$2,000 \text{ gal/day} \div 2.2 \text{ gal/ft}^2 = \mathbf{909 \text{ft}^2} \text{ of Absorption Area required}$$

Example 2 – Seepage Pits – using 2,000 gallons per day of Wastewater flow:

$$\pi D(d) = 909 \text{ft}^2$$

Where the diameter of the pit (D) is 10 feet and (d) is the effective depth in feet.

Solving for d:

$$d = 909 \text{ft}^2 / (3.14)(10 \text{ft})$$

$$d = \mathbf{29 \text{ft}}$$

Therefore more than one (1) pit will be needed. To design for two (2) pits, 10 feet in diameter:

$$d = 29 \text{ft} / 2 = \mathbf{14.5 \text{ft depth for each pit}}$$

- Disposal Field Design based on Soil Data (reference 2016 California Plumbing Code, Table H201.1(3)):

SOIL TYPE	REQUIRED SQUARE FEET OF LEACHING AREA PER 100 GALLONS OF WASTEWATER	MAXIMUM ABSORPTION CAPACITY IN GALLONS PER SQUARE FEET OF LEACHING AREA FOR A 24 HOUR PERIOD
Coarse sand or gravel	20	5.0

Fine sand	25	4.0
Sandy loam or sandy clay	40	2.5
Clay with considerable sand or gravel	90	1.1
Clay with small amount of sand or gravel	120	0.5

- For gravel-less OWTS:

Size the disposal field according to the manufacture's specifications. High capacity gravel-less chambers equal five (5) square feet per lineal foot and in accordance with CDAEMD for the Medium to be used in the OWTS.

EZ Flow or equivalent designs are calculated the same as a graveled trench side wall plus the bottom area of the trench.

## SECTION 2B. SETBACKS

1. General setback requirements are provided in Table 7.

FEATURE REQUIRING SETBACK	DISPOSAL FIELD AND REPLACEMENT AREA (ft)	SEPTIC TANK (ft)
Domestic well or spring	100	100
Seasonal wet area	50	50
Ephemeral stream or drainage course <sup>1</sup>	50	25
Lake or pond used for drinking water <sup>2</sup>	200	100
Flowing stream, lake, pond, marsh or wetland <sup>2</sup>	100	50
Domestic water service lines, lot lines, road easements, driveways, buildings <sup>3</sup>	5	5
Cuts or fills (down gradient)	Four (4) times maximum depth below grade, 25 feet maximum	10
Swimming pools	10	5

<sup>1</sup> As measured from the edge

<sup>2</sup> As measured from the ten (10) year high water mark

<sup>3</sup> Buildings include porches and steps, whether covered or uncovered, breezeways, roofed porte-cocheres, roofed patios, carports, walks, covered driveways, and similar structures or appurtenances

In addition to those setbacks cited on Table 7, Dispersal Areas shall not be permitted in the following areas:

- Land subject to flooding. In case of disputes concerning flooding potential, the flooded area shall be determined by calculating the expected ten-year frequency flood;

- Land closer than two hundred (200) feet to a lake or reservoir, measured from the high water line or one hundred (100) feet if down Slope from the lake or reservoir;
- Land closer than two hundred (200) feet to any spring, or 100 feet if downhill from the spring;
- Land within one hundred (100) feet of any existing or proposed private well site for the parcel or any adjoining parcel;
- Land one hundred-fifty (150) feet from a public water well where the depth of the Effluent Dispersal System does not exceed 10 feet in depth;
- Land two hundred (200) feet from a public water well where the depth of the Effluent Dispersal System exceeds ten (10) feet in depth. Land within and two hundred (200) feet from public wells;
- Where the Effluent dispersal system is within six hundred (600) feet of a public water well and exceeds twenty (20) feet in depth and the separation from the bottom of the OWTS and Groundwater is less than five (5) feet 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 two hundred (200) feet;
- Land closer than one hundred (100) feet to an intermittent, seasonal, or Perennial Waterway measured from the top of the bank or other physically evident high water line. An intermittent stream is one which may continue to flow for five days or more after the passage of a storm;
- Land closer than fifty (50) feet to an Ephemeral Stream, measured from the edge of a channel;
- Land closer than fifty (50) downhill from an irrigation ditch or canal;
- Land closer than fifty (50) uphill from an existing or proposed Cut;
- Land with a grade steeper than 30 percent (30%) unless there is a Slope stability report completed by a Qualified Professional;
- Filled land, unless the fill is engineered for sewage dispersal and approved by CDAEMD;
- Gravel bars of very porous materials adjoining a stream or body of water;
- Land used for utility or road easements. Overhead utility easements may be included if the utility, entity, or agency holding the easement gives a permanent and irrevocable release, easement, or license for sewage dispersal within the easement;
- Where the Effluent Dispersal System is within twelve hundred (1,200) feet from a public water system surface water intake point, and 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 four hundred (400) feet from the high water mark of the reservoir, lake, or flowing water body; and
- Where the Effluent Dispersal System is located more than twelve hundred (1,200) feet but less than twenty five hundred (2,500) feet from a public water system surface water intake point and 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 two hundred (200) feet from the high water mark of the reservoir, lake, or flowing water body.

For replacement OWTS that do not meet the above horizontal separation requirements, the replacement OWTS shall meet the horizontal separation to the greatest extent practicable. In such cases, the replacement OWTS shall utilize Supplemental Treatment and other mitigation

measures, unless the CDAEMD finds that there is no indication that the existing OWTS is adversely affecting a public water source and there is limited potential that the replacement OWTS could impact a water source based on topography, soil depth, soil texture, and Groundwater separation.

New OWTS installed on parcels of record existing at the time of the effective date of this OWTS Manual that cannot meet the above horizontal separation requirements, shall meet the horizontal separation to the greatest extent practicable and shall utilize Supplemental Treatment for pathogens.

Supplemental Treatment components designed to perform disinfection shall provide sufficient pretreatment of the Wastewater so that Effluent from the Supplemental Treatment components does not exceed a thirty (30) day average Total Suspended Solids (TSS) of thirty (30) mg/L and shall further achieve an Effluent fecal coliform bacteria concentration less than or equal to two hundred (200) Most Probable Number (MPN) per 100 milliliters.

**SECTION 2C. SPECIAL DESIGN OWTS**

A Special Design OWTS is any CDAEMD approved OWTS that is not a Standard OWTS.

All Special Design OWTS shall require written certification by the Qualified Professional that the Special Design OWTS has been installed and completed under his or her supervision and according to the approved site plan. The written certification shall be a wet signature on the CDAEMD stamp located on the site plan. (Example below)

<b>SPECIAL DESIGN ONSITE WASTEWATER TREATMENT SYSTEM</b>	
I hereby certify that this Special Design OWTS has been installed and completed under my supervision according to the approved site plan, construction permit, and according to the El Dorado County OWTS Manual and Ordinance Chapter 110.32.	
Date: _____	Signature: _____
Registration Number: _____	
Contractor: _____	

The following are Special Design OWTS requiring CDAEMD approval:

- OWTS infill
- Capping fill OWTS
- Pressurized distribution OWTS\*
- Pump systems
- Steep slopes greater than 30%
- Mound OWTS\*
- Large OWTS\*
- Supplemental Treatment OWTS\* (see Section 2D)

\*Shall require annual Operating Permits specifying monitoring and reporting requirements.

Unless otherwise indicated in Special Design OWTS sections or by CDAEMD, site evaluation criteria, design (including sizing), installation, and construction shall be in accordance with this OWTS Manual. All Special Design OWTS shall be installed by a Contractor.

### **OWTS Infill**

An OWTS infill is a Special Design OWTS where the disposal trench is in compacted fill.

- Compaction shall be completed in six (6) inch lifts and supervised by a Professional Civil Engineer or Professional Geologist.
- Compaction test data shall be provided to ensure proper compaction to nearly the same degree as native soil.
- Area to receive fill shall have the vegetation removed and shall be plowed, ripped, scarified, or disked on contour.
- The imported material shall have consistent characteristics as the native soil with a percolation rate equal to or slower than the percolation rate of the native soil, but not greater than one hundred twenty (120) MPI.
- Area to receive fill shall be less than 20% Slope unless the Qualified Professional makes a site specific justification and approval by CDAEMD.

### **Capping Fill OWTS**

A capping fill OWTS is a Special Design OWTS where the disposal trench effective sidewall is installed a minimum of twelve (12) inches into native soil below a soil cap of specified depth and texture (Diagram 1). The shallow construction of the capping fill OWTS allows for installation where depth to a limiting layer or Groundwater is closer to ground surface. This section describes the requirements for gravity-fed capping fill OWTS. Pressure-dosed capping fill OWTS shall meet the requirements of this section as well as the next section: Pressurized Distribution OWTS.

In order to be approved for a capping fill OWTS, each site must meet all of the following conditions:

- The Slope shall not exceed 20% in the Disposal Area and Replacement Area; and
- Unless otherwise approved by CDAEMD, the Effective Soil Depth shall be a minimum of five (5) feet below the bottom of the disposal trench and depth to Groundwater shall be five (5) feet minimum.

Unless otherwise specified, the capping fill OWTS shall conform to the provisions of this OWTS Manual and the following:

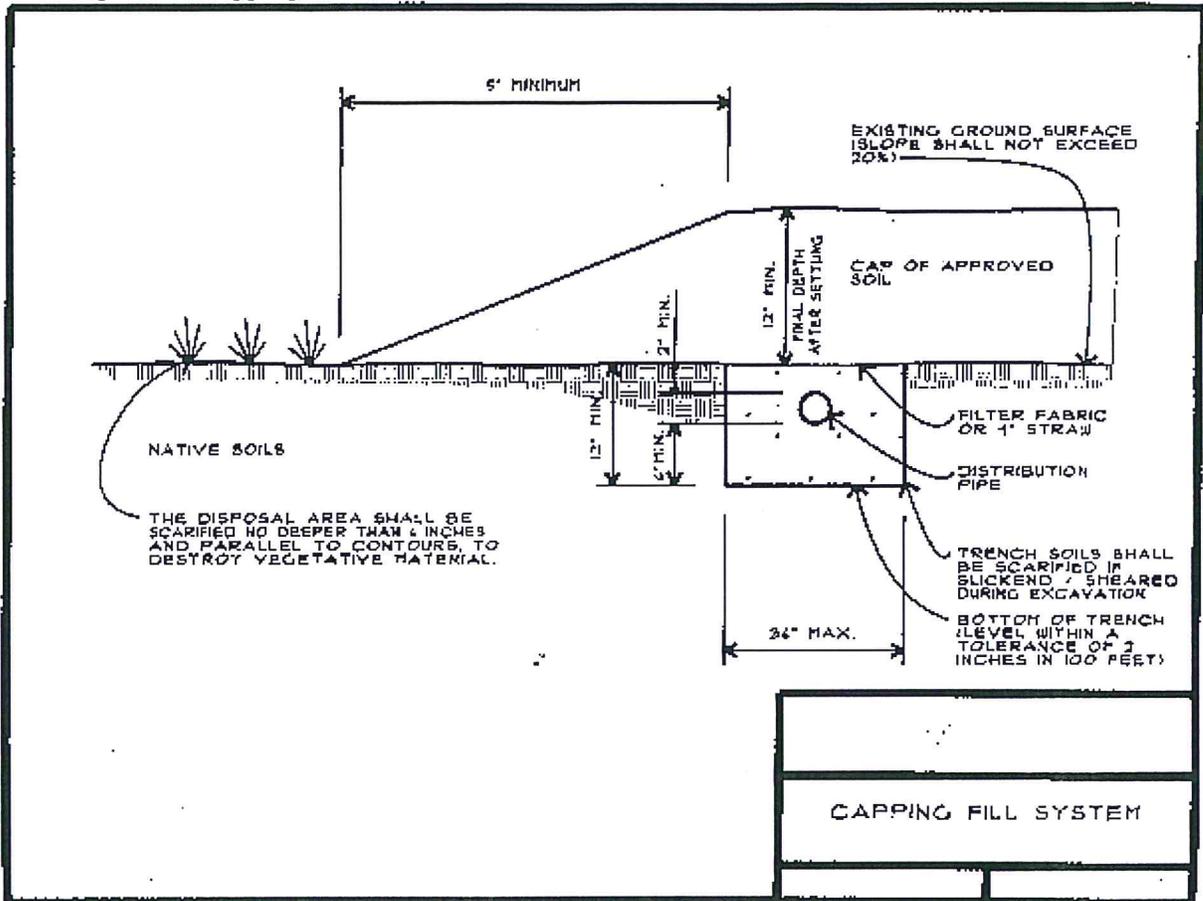
- Disposal trench depth of twelve (12) inches minimum;
- Disposal trench width of eighteen (18) inches minimum / Thirty-six (36) inches maximum;
- Cap depth of twelve (12) inches minimum (after settling);
- The cap soil texture shall be of the same textural class as the native topsoil or one textural class finer;
- The Disposal Area shall have the vegetation removed and shall be scarified, parallel to contours, and no deeper than six (6) inches;
- Soil cap shall extend a minimum of five (5) feet beyond the exterior trench sidewall and have a three (3) foot horizontal to one (1) foot vertical ratio;

- The site shall be protected from erosion in accordance with County and Resource Conservation District erosion control requirements; and
- Capping fill finish grade elevation shall be determined using an established benchmark to ascertain there is twelve (12) inches minimum fill.

Required inspections by the Qualified Professional:

- The Disposal Area and fill material shall be inspected for scarification, soil texture, and moisture content prior to backfill of the installed disposal field; and
- The final placement of the soil cap.

Diagram 1 - Capping Fill System



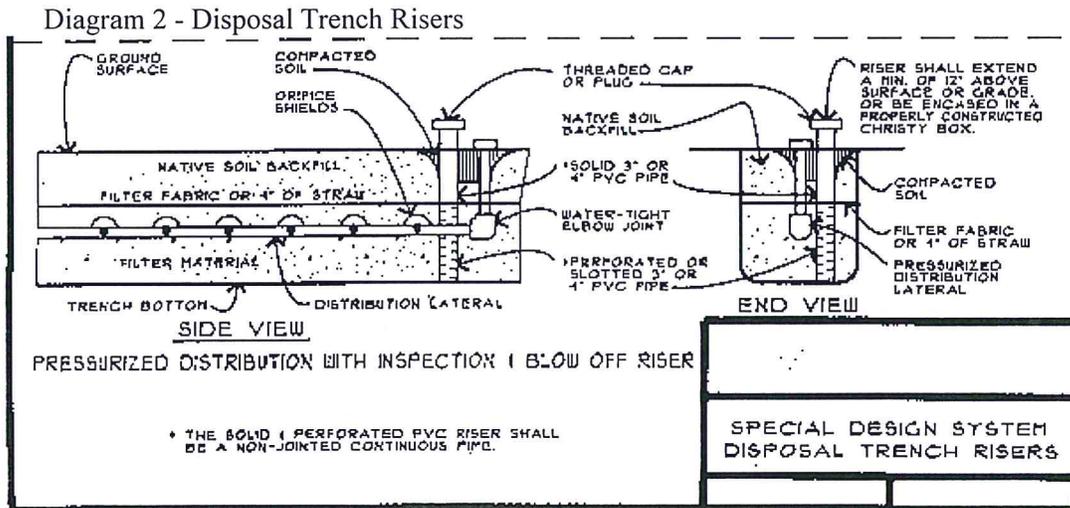
**Pressurized Distribution OWTS**

Pressurized Distribution OWTS is a Special Design OWTS where the Effluent is evenly distributed over the entire soil Absorption Area through a network of small diameter pipes under low pressure. Pressurized Distribution OWTS will require an annual Operating Permit.

Design, materials, and construction requirements:

- The proposed Disposal Area and Replacement Area shall demonstrate a minimum of five (5) feet of Effective Soil Depth beneath the disposal trench bottom;
- All materials used in pressurized systems shall be structurally sound, durable, and capable of withstanding normal stresses incidental to installation and operation;
- Nothing in these rules shall be construed to set aside applicable building, electrical, or other codes. An electrical permit and inspection from the Community Development Agency, Development Services Division (CDADSD) shall be obtained if required for pump wiring installation;
- For Pressurized Distribution OWTS where trench depth is less than twenty-four (24) inches, percolation tests shall be performed in the layer of most restrictive permeability that occurs within five (5) feet of the trench bottom. The deeper percolation test data shall be considered in the site evaluation design of the OWTS; and
- Piping, valves, and fittings for pressurized systems shall meet the following minimum requirements:

- All pressure transport, manifold, distribution lateral piping, and fittings shall meet or exceed the requirements for Schedule 40 PVC pressure pipe as identified in ASTM Specification D1785 or other material approved by the CDAEMD;
- All pressure distribution laterals and fittings shall be adequately sized for the design flow; a minimum of two (2) feet per second velocity at the end of the OWTS and a minimum three (3) feet residual head;
- All pressure transport and manifold piping shall be adequately sized for the design flow and minimum two (2) feet per second velocity;
- Pressure transport piping shall be uniformly supported along the trench bottom, and at the discretion of CDAEMD, it shall be bedded in sand or other material approved by CDAEMD;
- The ends of lateral piping shall have blow-off risers that accommodate threaded plugs or caps (Diagram 2);
- All joints in the pressure distribution manifold, lateral piping, and fittings shall be solvent welded, using the appropriate solvent for the pipe material. Pressure transport piping may be solvent welded, threaded, or rubber ring jointed;
- A ball valve shall be placed on the pressure transport pipe, near the dosing tank, when required; and
- A check valve shall be placed between the pump and the ball valve, when required. A check valve is not required if the pump has an internal check valve. All check valves and ball valves must be in an accessible and protected location for maintenance and repair.



- The pump shall meet the minimum design, materials, and construction standards for use in Wastewater applications.
- Dosing tank design, materials, and construction requirements:
  - Materials and construction for dosing tanks shall have a minimum capacity of five hundred (500) gallons;
  - The float level elevations shall be clearly identified on the plan;
  - A minimum 1,500-gallon Septic Tank must be used;
  - In no event shall the liquid portion be drawn down to within twelve (12) inches of the tee fitting or baffle slot in the common compartment wall; and
  - The pump must be located within a screened vault.

- The dose volume shall be calculated using the following minimum and maximum dosing range formulas:

$$V_{min} = V_s + 5V_1$$

$$V_{max} = V_s + 10V_1$$

Where:  $V_{min}$  is the minimum volume of dose  
 $V_{max}$  is the maximum volume of dose  
 $V_s$  is the volume of supply line  
 $V_1$  is the total volume of lateral lines

Disposal trench design, materials, and construction requirements:

- Disposal trenches shall be constructed using the specifications for the standard disposal trench, except for the following:
  - Pressure lateral piping shall have a minimum six (6) inches of filter material below and not less than one (1) inch of filter material above the piping;
  - Depth shall be a minimum of one (1) foot;
  - Bottom width shall be a maximum of three (3) feet; and
  - Length of lateral shall be limited to that length which will result in no more than a 10% head loss over the length of the lateral.
- The top of the filter material shall be covered with filter fabric or other material approved by the CDAEMD;
- A minimum of twelve (12) inches of backfill is required over the soil barrier material within the disposal trench;
- Inspection and blow-off risers constructed in accordance with Diagram 2 shall be placed at the end of the pressure distribution lateral within the disposal trench; and
- All orifices of pressure distribution laterals shall face upward and shall be covered with orifice shields to prevent soil washout.

Hydraulic design criteria:

- There shall be a minimum six (6) feet head (squirt) at the most remote orifice and no more than 10% head variation between the most near and remote orifices within a disposal field;
- Lateral piping shall have discharge orifices drilled upward, a minimum diameter larger than screen filter holes of one-eighth (1/8) inch, and evenly spaced at a distance not greater than two (2) feet in coarse textured soils or greater than six (6) feet in finer textured soils;
- Unless otherwise indicated on the Permit or elsewhere in this section, the installation standards specified in this manual shall apply:
  - The pressure distribution lateral laid within the center of the trench above the gravel shall be level to within two (2) inches in one hundred (100) feet;
  - Each dosing tank shall be installed on a stable level base;
  - Each dosing tank shall 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. The watertight riser shall meet the materials and construction provisions in the section for Septic Tanks; and
  - Dosing tanks located in high Groundwater areas shall be weighted or secured to prevent flotation.

Sloping site requirements:

- Ball valves or flow restrictors shall be installed on each pressure distribution lateral to facilitate regulation of flow within each lateral;
- Where the disposal field is located down Slope from the pump, an anti-siphon device placed at the highest point on the supply line to the trenches shall be installed in the dosing tank; and
- Additional required inspections include the following:
  - Inspection of the dosing system components, e.g., the location of the pump, screen, switches, alarms, and valves; and
  - Inspection of the pressure distribution system and verification of hydraulic head over the pressure distribution laterals.

**Pump Systems**

Pump systems are typically utilized to enable the installation of a disposal field up Slope of the structure to be served. Wastewater flows by gravity to a Septic Tank followed by a pump tank, where the Effluent is distributed to the disposal field by pumping to a higher elevation. Pressure-dosed pump OWTS shall meet the requirements of this section as well as the previous section: Pressurized Distribution OWTS.

Criteria for approval:

- Drainage from Septic Tanks located below the level of the disposal field shall discharge into a separate, approved, watertight pump tank. The pump tank shall receive Septic Tank Effluent only;
- All pump systems shall have a surge box or distribution box;
- Community Service Districts maintained by a Public Entity shall follow their approved OWTS design guidelines;
- Nothing in these rules shall be construed to set aside applicable building, electrical, or other codes. An electrical permit and inspection from the CDADSD shall be obtained if required for pump wiring installation; and
- Unless otherwise indicated on the Permit, installation requirements shall conform to the provisions of this OWTS Manual.

Pump tank requirements:

- The pump tank shall be located to receive the Wastewater by gravity drainage;
- Pump tanks shall be watertight and constructed of approved materials and in accordance with specifications for Septic Tanks;
- The pump tank shall have capacity sufficient to deliver the design dose and have a minimum capacity of five hundred (500) gallons;
- Each pump tank shall be provided with a riser extending to the ground surface or above, with a minimum inside horizontal measurement equal to or greater than the tank access manhole. The lids to the tank shall be water tight. Provision shall be made for securely fastening the manhole cover to prevent entrance by unauthorized persons; and
- Pump tanks in high Groundwater areas shall be weighted or secured to prevent flotation.

Piping Requirements:

- The drainage piping connecting the Septic Tank and the pump tank shall be at least three (3) inches in diameter;
- The pump discharge piping shall be sized to adequately handle all expected flows;

- The discharge piping shall be provided with an accessible check valve and ball valve;
- Class 200 PVC water pipe or equivalent shall be used; and
- Velocities shall be maintained between two (2) to ten (10) feet per second.

**Mechanical Device Requirements:**

- Check valves, ball valves, pumps, motors, switches, and other mechanical devices required by this section shall be located where they will be readily and easily accessible for inspection and repair at all times and shall be enclosed in a watertight pit fitted with an adequately sized removable cover, unless continuously exposed;
- Check valves, ball valves, pumps, motors, switches, and other mechanical devices shall be designed and manufactured to operate in Septic Tank Effluent or Wastewater;
- The pumps shall be made specifically for Wastewater;
- All devices and equipment associated with pump tanks shall be protected by a weatherproof structure; and
- All pump tanks shall be equipped with a high water level alarm system.

**Inspection Requirements:**

- Qualified Professionals shall inspect the open trenches and the pump during operation for proper velocities;
- Pump Systems and alarms shall be operational at the time of final inspection; and
- Final sign off shall not occur until the electrical OWTS Permit has been approved by the CDADSD.

**Steep Slope OWTS**

Steep Slope OWTS is a Special Design OWTS installed on sites with Slopes greater than 30%. Slopes greater than 30% must have a Slope stability report approved by a Qualified Professional.

For proposed developments on Slopes exceeding 30%, the septic Effluent disposal field shall be placed on the portions of the property having the lowest Slope gradient unless physical conditions on the site, as documented by the Qualified Professional, render such placement infeasible or in conflict with other requirements as determined by the CDAEMD.

A steep Slope OWTS shall meet the following requirements:

- The Qualified Professional shall address distance from trench sidewall to soil surface (sidewall break out distance) and it shall be a minimum of twenty-four (24) inches to flow line as measured on the downhill side;
- Steep Slope OWTS will not be approved on unstable landforms; and
- For steep Slope OWTS the site shall be protected from erosion in accordance with County and Resource Conservation District erosion control requirements.

**Mound OWTS**

A mound OWTS is an aboveground absorption field useful in mitigating some of the limitations associated with inadequate Effective Soil Depth. The mound OWTS consists of a distribution network that, under pressure (see section regarding Pressurized Distribution OWTS), evenly delivers Effluent from a Septic Tank to a “mounded” bed of filter material over sand media or other media approved by CDAEMD. Mound OWTS are Special Design OWTS that require an annual Operating Permit.

Mound OWTS shall meet the following requirements:

- An absorption rate of 1.2 gallons per day per square foot (based on 150 gallons per Bedroom per day) shall be used for calculating the mound sand bed area;
- Sand media as defined in Table 8 shall be used for the sand bed; and
- Unless otherwise approved, the mound OWTS shall only be considered for use for a single-family Dwelling and shall not be installed on Slopes greater than 5%.

SIEVE SIZE	PERCENT PASSING THROUGH
3/8	100
4	95-100
8	75-85
16	45-55
30	20-30
50	5-15
100	0-2
200	0

**Large OWTS**

Large OWTS have projected daily Wastewater flows greater than two thousand five-hundred (2,500) gallons, and have waste characteristics other than typical residential, from either a residential or Commercial Facility. Large OWTS are Special Design OWTS and shall require an annual Operating Permit. Projected daily Wastewater flows greater than ten thousand (10,000) gallons must be reviewed and approved by the RWQCB.

The County may allow community OWTS and other alternative solutions as an acceptable option to traditional Wastewater treatment for mobile home parks, commercial and industrial centers, and multifamily residential. The Applicant must prove, and the County must find, that the proposed OWTS will be adequately and safely operated and can accommodate the highest possible demand of the project. Community OWTS in remote areas may be considered where the geology may not be conducive to constructing individual OWTS.

Unless otherwise authorized by CDAEMD, designs for large OWTS shall meet, at a minimum, all of the following:

- The Disposal and Replacement Areas shall be divided into a minimum of two (2) disposal fields;
- Effluent distribution shall alternate between the disposal fields;
- If the OWTS is pumped, it shall have at least two (2) alternating pumps; and
- Unless otherwise specified, Septic Tank design, materials, and construction shall conform to the provisions of this OWTS Manual.

**SECTION 2D. SUPPLEMENTAL TREATMENT OWTS**

Supplemental Treatment OWTS are Special Design OWTS that may be used to serve individual single-family residences, multi-family residential structures, commercial establishments, and institutional or industrial facilities. Supplement Treatment OWTS are required for OWTS that cannot meet setbacks and where Groundwater is less than five (5) feet but not more than two (2) feet below the depth of the Disposal Area. Supplemental Treatment OWTS shall require an annual Operating Permit.

All Supplemental Treatment OWTS shall be installed by an approved Contractor that is familiar with the Supplemental Treatment OWTS being installed. All Supplemental Treatment OWTS must be American National Standards Institute (ANSI) or National Sanitation Foundation (NSF) approved unless otherwise exempted by CDAEMD.

Notwithstanding any other provisions, final approval of Supplemental Treatment OWTS proposals shall be at the discretion of the Director.

#### **Design standards**

Engineering plans and site data for Supplemental Treatment OWTS shall be submitted in accordance with Standard OWTS application procedures. Site evaluations, including soil profile evaluation and percolation testing, shall be conducted in accordance with standard procedures provided in Section 1A: Site Evaluation of this OWTS Manual. However, soil separation between the bottom of the dispersal field and high seasonal Groundwater, impervious layer of soil or Bedrock, or fractured/weathered Bedrock may be reduced to two (2) feet.

OWTS with Supplemental Treatment components shall be equipped with a visual or audible alarm as well as a telemetric alarm that alerts the Owner and Service Provider in the event of OWTS malfunction. OWTS using Supplemental Treatment shall, at a minimum, provide for twenty-four (24) hour Wastewater storage based on design flow as a means to minimize Pollution from overflow discharge after an OWTS malfunction or power outage.

#### **Inspections**

Designs for Supplemental Treatment OWTS shall be signed by a Qualified Professional. The Qualified Professional shall also be responsible for inspection of OWTS installation to assure conformance with approved plans and shall provide an as-built drawing of the installation to the CDAEMD and property Owner. The construction inspection by the Qualified Professional shall be in addition to the CDAEMD inspection. The Qualified Professional shall provide a construction inspection schedule which identifies critical inspections to be conducted by the Qualified Professional.

#### **Operation, maintenance and monitoring instructions**

The Qualified Professional shall provide operation, maintenance and monitoring instructions in the design which are brief and simple guidelines regarding the operation of the OWTS, Owner's responsibilities, and OWTS monitoring requirements.

### **SECTION 2E. OPERATING PERMITS**

In addition to a construction Permit, an Operating Permit is required for steep slope, large OWTS, mound OWTS, pressurized distribution OWTS, and Supplemental Treatment OWTS. The provisions outlined in this section may also apply to any Special Design OWTS if determined necessary by the CDAEMD.

Operating Permits shall be issued at the time of final approval of the OWTS and they are required to be renewed every year. Operating Permits shall also be renewed at the time of sale of the parcel or, in the case of commercial properties, upon change of occupants where the sewage flows increase or change significantly and may affect the OWTS operation.

The Operating Permit shall include a contract with a Service Provider to inspect the OWTS every six months and to file a report with CDAEMD within thirty (30) days after the inspection. Further, if the OWTS has a grease trap or interceptor, it shall be inspected and cleaned every 3 months, or more frequently if needed.

Operating Permits when required are intended to serve as the basis for verifying the adequacy of OWTS performance, maintenance and continued proper operation for the protection of public health and safety and the environment. The property owner must record the Operating Permit for the parcel with the El Dorado County Recorder Clerk's Office.

Operating Permit conditions shall include monitoring and inspection requirements, Permit duration, and other provisions that may be specified by the Qualified Professional. The Owner for the OWTS shall grant access to CDAEMD for periodic inspection of OWTS operation.

Renewal of an annual Operating Permit requires payment of applicable fees and the results of required OWTS biannual monitoring and inspection, if not previously provided. Failure to submit a required fee, or specified monitoring and inspection data, or failure to undertake any required corrective work specified by CDAEMD may be cause for non-renewal or revocation of the Operating Permit. The unpaid balance on the Operating Permit shall be sent to El Dorado County Revenue Recovery and further enforcement action may be pursued against the property Owner pursuant to the Enforcement provisions of this OWTS Manual and County Ordinance Code 110.32.

At the time a property is transferred or sold, an Operating Permit application, the most recent biannual inspection report, and applicable fees shall be remitted to CDAEMD within thirty (30) days of close of escrow or property sale.

#### **Performance Monitoring and Reporting**

- Monitoring of OWTS subject to annual Operating Permits shall be conducted by a Service Provider. CDAEMD may conduct spot-check inspections of Supplemental Treatment OWTS and may also be present to observe the performance of monitoring activities conducted by the Service Provider.
- Monitoring requirements will vary depending upon the specific type of OWTS but, in general, they will include the following:
  - Recording of Wastewater flow based on water meter readings, pump event counters, elapsed time meters, or other approved methods;
  - Inspection and recording of water levels in any monitoring points in the disposal field;
  - Inspection and observation of pump operation or other mechanical equipment;
  - General inspection of treatment and Disposal Area for evidence of seepage, Effluent surfacing, erosion, or other indicators of OWTS malfunction;
  - The frequency of monitoring shall be in accordance with the manufacturer's specification for OWTS performance requirements (where an Operating Permit is required), but monitoring shall be conducted at least twice per year;

- Monitoring frequency may be increased if OWTS problems are experienced;
- A monitoring report shall be submitted to CDAEMD biannually within thirty (30) days after the inspection. The monitoring report shall be signed by the Service Provider responsible for the monitoring. CDAEMD shall be notified immediately of any OWTS problems observed during routine inspection and monitoring, or at any other time.

## **SECTION 3 – MATERIALS, CONTRUCTION, AND INSTALLATION<sup>3</sup>**

### **SECTION 3A. SEPTIC TANK**

#### **Installation – General Provisions**

- The Septic Tank shall be set level in place on undisturbed soil. A layer of approved bedding material may be used;
- Septic Tanks installed in areas subject to vehicular traffic shall be designed to support an H-20 AASHTO traffic loading;
- Septic Tanks shall not be installed in areas of high Water Table unless specifically designed to account for this situation;
- Septic Tanks installed under concrete or black top paving shall have the required manholes accessible by extending the manhole openings to grade meeting H-20 AASHTO traffic loading;
- Effluent filters designed to prevent solids in excess of one-eighth (1/8) inch in diameter from passing to the disposal field are required in the sanitary tee on the outlet side of the Septic Tank; and
- Fiberglass and Polyethylene Tank Requirements:
  - Shall be bedded on at least six (6) inches of sand or soil not containing large or sharp rocks;
  - Shall be bedded to the horizontal midpoint of a sewer pipe (spring line) with select material, hand tamped in not over twelve (12) inch lifts, or pond and jetted; and
  - Shall be covered from the spring line up with material that will not puncture the tank. Care shall be taken during placement to minimize settling.

#### **Fittings**

- The inlet and outlet pipe openings and fittings shall not be less in size than the connecting sewer pipe. A baffle type fitting shall have the equivalent cross-sectional area of the connecting pipe and not less than four (4) inch horizontal dimension when measured at the inlet and outlet pipe inverts;
- The inlet and outlet pipe or baffle (sanitary tee) shall extend four (4) inches above and at least twelve (12) inches below the water surface. The base of the inlet pipe shall be at a level not less than two (2) inches above the base of the outlet pipe; and
- Inlet and outlet pipe fittings or baffles, and compartment partitions shall have a free vent area equal to the required cross-sectional area of the house sewer or private sewer discharging therein to provide free ventilation above the water surface from the

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<sup>3</sup> All Special Design OWTS shall be installed by a licensed Contractor, holding an A, C12, or C42 license.

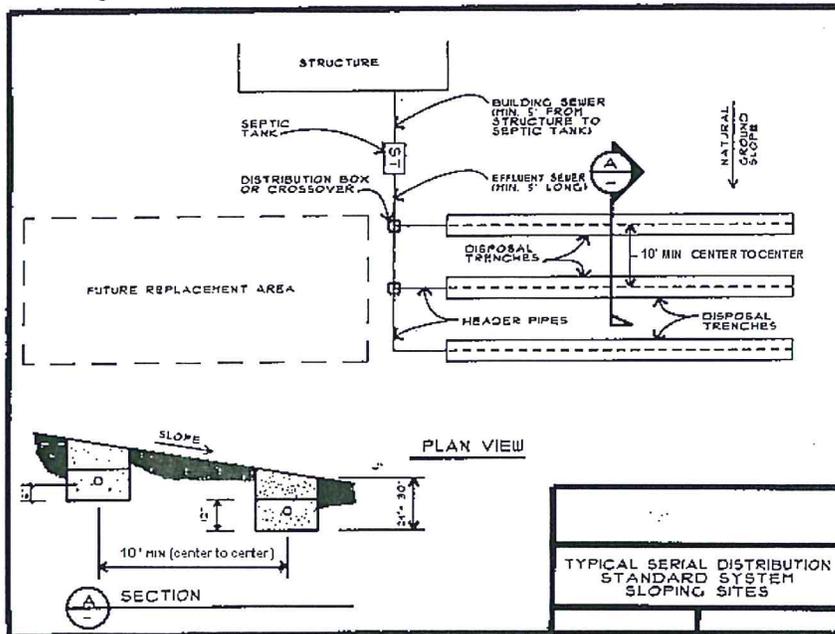
disposal field or seepage pit through the Septic Tank, house sewer, and stack to the outer air.

### SECTION 3B. SERIAL DISTRIBUTION MATERIALS AND CONSTRUCTION

(See Diagram 3)

Serial distribution shall be used for gravity fed OWTS where multiple trenches are utilized unless otherwise approved by CDAEMD.

Diagram 3 - Serial Distribution



#### Distribution Box Construction

At a minimum distribution boxes shall be constructed as follows:

- Distribution boxes shall be constructed of concrete, high density polyethylene, or other materials acceptable to CDAEMD;
- Distribution boxes shall be watertight and designed to accommodate the necessary distribution laterals and expected flows. The top, walls, and bottom of concrete distribution boxes shall be at least one and one-half (1.5) inches thick;
- Distribution boxes, when used, shall be installed on undisturbed soil or on concrete, with leach field piping to allow serial distribution to multiple leach lines; and
- Distribution boxes shall be installed on native soil with a five (5) foot separation from leach lines by an undisturbed soil platform.

#### Serial distribution

- Serial distribution is to be utilized on sloping ground as determined by the Qualified Professional;
- Each horizontal leaching trench shall be utilized to the maximum capacity before the Effluent shall pass to the next lower leach line;
- The lines between each horizontal leaching section shall be made with watertight joints;

- Connections between a Septic Tank and a distribution box, or between a distribution box and a leach line, shall be laid in native ground; and
- Effluent sewer pipe, header pipe, and fittings (all Tight Line). Tight Line shall extend a minimum of five (5) feet out of the distribution box toward Disposal Area.

#### **Pipe Fitting**

- Pipe fittings shall meet the minimum standards established in Section 3A;
- Pipe fittings shall be located within the disposal trench, firmly bedded in the filter material;
- All joints shall be glued so as to be watertight; and
- Diversion valves shall be constructed of durable material and be corrosion-resistant, watertight, and designed to accommodate the inlet and outlet pipes. CDAEMD shall approve all diversion valves.

### **SECTION 3C. EFFLUENT PUMP, CONTROL, AND ALARM MATERIALS**

Unless otherwise specified, Effluent pumps, control boxes, and alarm materials, and their construction, shall be in conformance with this section.

#### **Electrical Components**

Electrical components used in OWTS shall comply with the California Uniform Electrical Code and the following provisions:

- Pumps shall be automatically controlled by sealed mercury float switches with a minimum mercury tube rating of twelve (12) amps at one hundred fifteen (115) volts AC or by a CDAEMD approved equivalent;
- Pumps shall have automatically resetting audible and visual high water level alarm with manual silence switch that is located in or near the building served by the pump. The audible alarm shall be installed and constructed so that it can only be canceled by the user;
- Wiring must be of proper construction and gauge and permanently fixed to a supporting structure under permit from the CDADSD;
- The pump and alarm must be connected to separate circuits;
- Pump control panel shall have a cycle counter and an elapsed time meter; and
- There shall be a manual override switch in the electrical box to facilitate dosing control during inspections.

### **SECTION 3D. PIPING MATERIALS AND CONTRUCTION**

#### **Effluent Sewer Pipe and Pressurized Pipe**

Unless otherwise specified, piping shall consist of materials and be constructed in conformance with the standards of this section:

- All piping shall be free of defects or damage;
- All connection of pipes of different diameters shall be glued with the proper fittings;
- Effluent sewer, header pipe (Tight-Lines), and fittings shall be a minimum four (4) inch diameter, watertight, and shall be one of the following:
  - Schedule 40 PVC that meets the most current American Society for Testing Materials (ASTM) D-2672 for minimum four (4) inch pipe;

- Schedule 40 Acrylonitrile-Butadiene-Styrene (ABS) that meets the most current ASTM Specification D-2468;
- ASTM SDR 35 with solvent-welded or rubber-gasket joints; or
- Other material approved by CDAEMD.
- Pressure transport pipe, pressure distribution manifolds, and pressure distribution laterals (piping and fittings) shall meet the most current requirements for schedule 40 PVC pressure pipe as identified in ASTM Specifications D-1785 or other material approved by CDAEMD;
- Pressure transport pipe, pressure distribution manifolds, and pressure distribution laterals shall be adequately sized for the design flow;
- Tight-Line under driveways shall be Schedule 40, SDR 35, or other approved pipe with at least twelve (12) inches of natural soil cover; and
- Suspended tight line crossing streams or drainage courses shall be piped and installed within a protective sleeve of approved material that extends ten (10) feet on each side of the seasonal or high water mark for the seasonal drainage course or twenty five (25) feet for a year-round stream. Crossings above streams or drainage courses shall be designed to support the weight of the sleeve, the tight line flowing full, and other loading conditions as set forth in the Uniform Building Code. Crossings above the stream or drainage course shall be installed a minimum of one (1) foot above the 100 year recurrence interval high water level.

#### **Perforated Pipe**

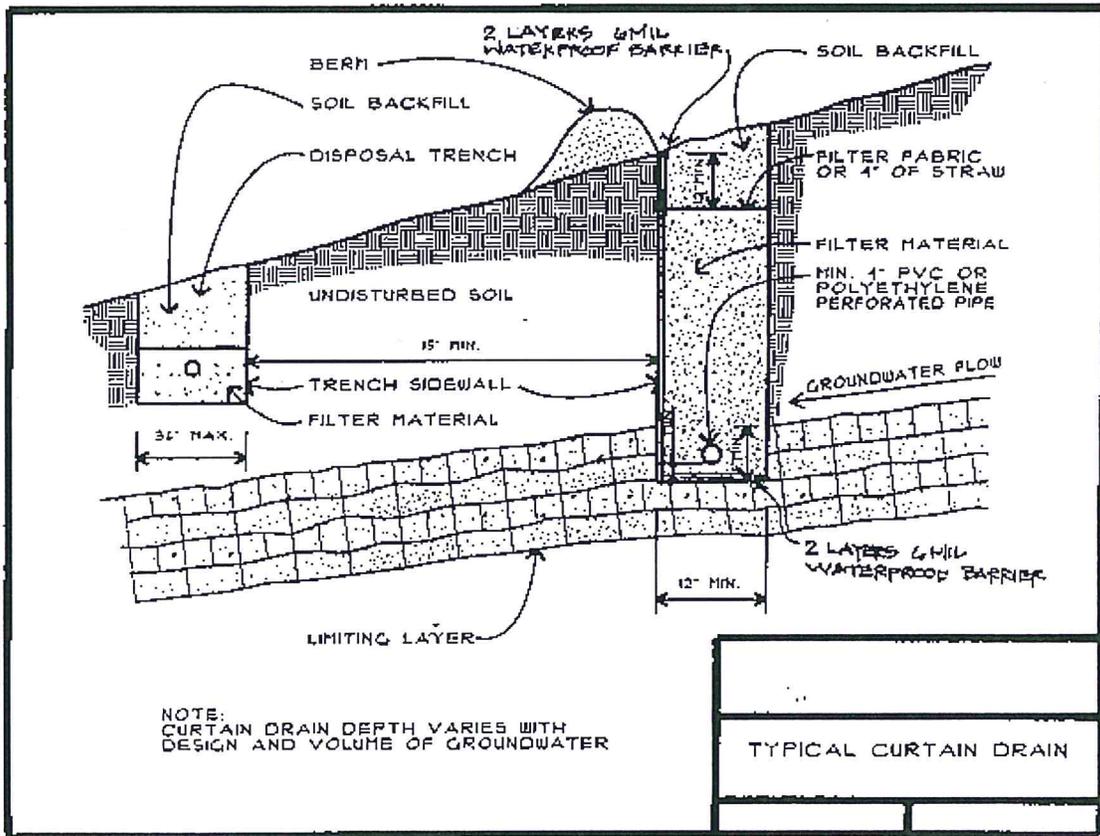
- Perforated distribution piping for gravity flow OWTS shall be a minimum of four (4) inches diameter, constructed of 3000 HDPE (or equivalent) that meets the most current ASTM Specifications F-810 or other material approved by CDAEMD.
- Perforated distribution piping for gravity flow OWTS shall have two (2) rows of holes spaced one hundred-twenty (120) degrees apart and sixty (60) degrees on either side of a centerline facing down.

### **SECTION 3E. OWTS WITH A CURTAIN DRAIN**

**General Requirements** Unless otherwise approved, a curtain drain (Diagram 4) shall meet the minimum requirements as follows:

- All curtain drains shall be designed and inspected by a Qualified Professional;
- Curtain drains shall be ten (10) to fifteen (15) feet uphill from the Disposal Area and the outflow shall be placed so as to not to affect the OWTS;
- All other requirements for OWTS approval, except depth to Groundwater, shall be met at the time of installation. After the drain is installed, the depth to Groundwater shall conform to the requirements for vertical separation to Groundwater for the proposed OWTS; and
- CDAEMD has the discretion of requiring demonstration that a proposed curtain drain is effective prior to issuing a construction Permit.

Diagram 4 - Curtain Drain



**Design, Construction, and Materials**

- The trench shall be situated so that captured water drains by gravity flow out of outlet pipes.
- Trench bottoms shall maintain a minimum of 1% Slope throughout the drainage trench. In areas where the outlet pipe will be subject to damage, the pipe shall be adequately protected.
- The trench shall be a minimum of twelve (12) inches wide. It shall extend from ground surface at least six (6) inches into a limiting layer. For a vertical drain, the trench shall penetrate through the limiting layer into a permeable soil.
- The bottom and the downhill side of the trench may be lined with a waterproof barrier. Material shall be equivalent to two (2) layers of six-mil. plastic. The waterproof barrier shall be placed along the downhill side of the trench wall and at the bottom of the trench.
- A four (4) inch minimum diameter perforated pipe approved for use in OWTS shall be laid the entire length of the trench with two (2) inches of gravel underneath the pipe.
- The drain trench shall be filled with Drain Rock. Prior to backfilling the trench, the Drain Rock shall be covered with filter fabric. A minimum of six (6) inches of soil cover shall be placed over the trench.
- In the event that the discharge outflow from a curtain drain will impact a neighboring property, the trench outlet from the drain shall only discharge into a

drainage channel or other conveyance designed for the transport of water, unless otherwise approved by CDAEMD.

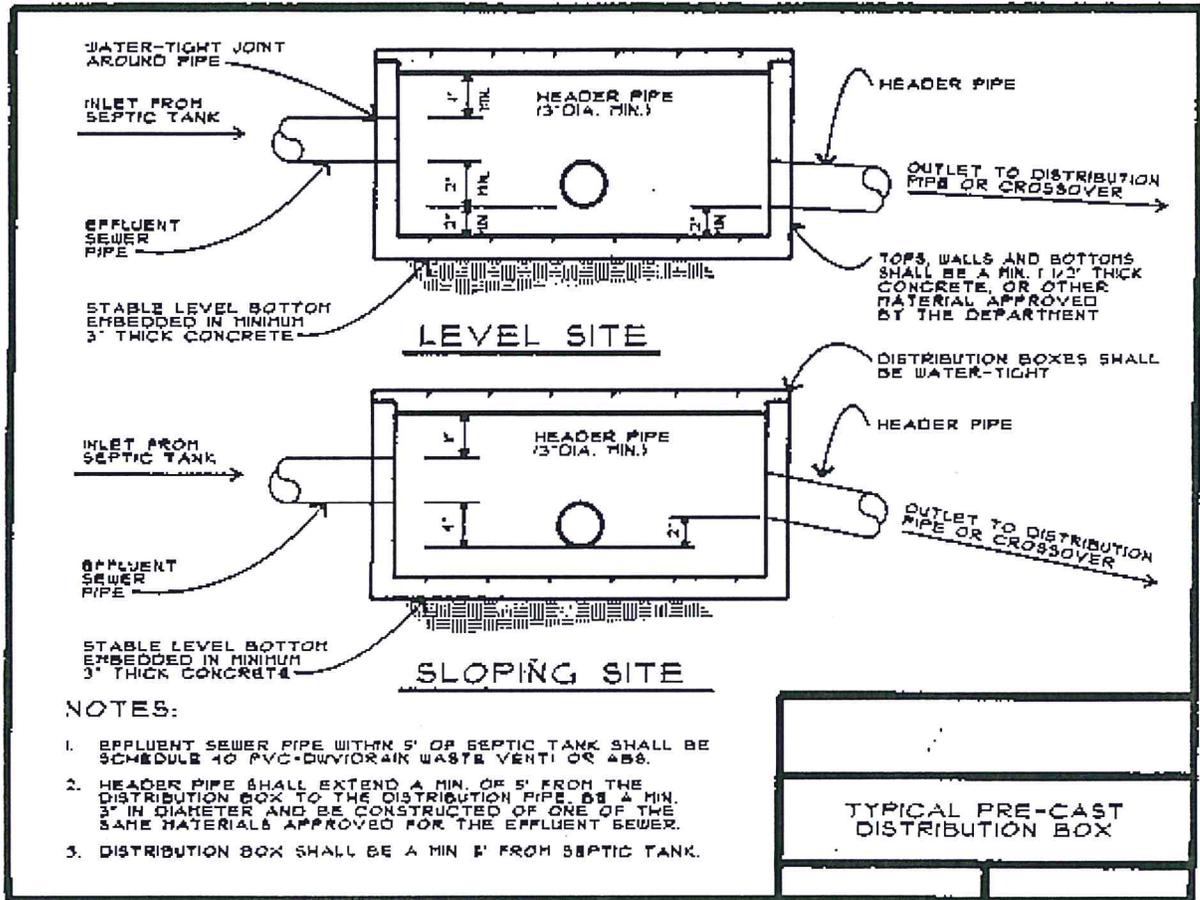
### **SECTION 3F. DISPOSAL FIELD INSTALLATION AND MONITORING**

#### **Construction**

Disposal fields shall be protected from vehicle traffic, and confined animal and livestock areas and shall remain unencumbered by structures, above ground swimming pools, and any other use that may damage or compact the soil above the disposal field. Variances when proposed by a Qualified Professional will be reviewed and approved on a case by case basis. Disposal fields shall be constructed as follows:

- Depth of natural earth over the entire disposal field as measured from the lowest point of natural grade is twelve (12) inches;
- Maximum "drop" in leach line drain pipe and/or the bottom of trench is three (3) inches maximum in a one hundred (100) feet line;
- Minimum spacing of leach lines is ten (10) feet center-to-center;
- Minimum trench width is eighteen (18) inches;
- Tight Line shall have minimum Slope of one-eighth (1/8) inch per foot;
- Drain line pipe ends must be capped;
- Observation risers shall be installed in every leach line;
- Chambers or other media OWTS shall be installed in accordance to manufacturer's specifications and approval by CDAEMD;
- All smeared sidewall surfaces shall be scarified;
- Drain Rock shall be clean, sound, gravel or crushed rock ranging in size from 3/4 to 1 1/2-inch diameter, with less than 5% outside this range. Rock and gravel shall contain no more than 1% fines, dust, sand, or clay by weight (less than 1% by weight passing the #200 sieve);
- The drain lines shall be covered with a minimum two (2) inch of Drain Rock, and then covered with an approved soil barrier cover of filter fabric, untreated paper, or straw to prevent closure of voids with earth backfill;
- No earth backfill shall be placed over the soil barrier cover until after inspection and approval by CDAEMD;
- Multiple disposal field laterals, wherever practical, shall be of uniform length; and
- Where two (2) or more drain lines are installed, distribution boxes or pipe fitting Distribution shall be provided in accordance with Diagram 5.

Diagram 5 - Pre Cast Distribution Box



### SECTION 3G. COMMERCIAL OR INDUSTRIAL SPECIAL LIQUID WASTE DISPOSAL

Effluent containing commercial or industrial waste which could affect the satisfactory functioning of an OWTS shall have pretreatment devices such as an interceptor tank. Food facilities that generate grease connected to an OWTS shall be required to install a grease interceptor that is at least five hundred (500) gallons unless an acceptable alternative is recommended by a Qualified Professional and approved by CDAEMD. All interceptors shall be sized, installed, and operated based on the manufacturer's instructions and shall meet the most recently adopted CPC requirements.

Liquid waste containing hazardous substances may not be discharged into an OWTS.

### SECTION 3H. CESSPOOLS AND HOLDING TANKS

The installation of Cesspools and similar excavations are prohibited in the County.

Any existing cesspool discovered by CDAEMD through the repair or complaint process, or through an application to increase the capacity of any existing OWTS, shall be properly

destroyed and replaced with an OWTS acceptable under the LAMP and OWTS Manual and approved under the same process noted in Section 4, Repair or Additions to OWTS. Permits will not be issued for the construction of any cesspool.

The installation of Holding Tanks is not an approved method of sewage disposal in the County. Exemption to this prohibition may be granted by CDAEMD if it is necessary to use a Holding Tank to abate a nuisance or health hazard caused by an OWTS failure while that OWTS is properly repaired. Such exemption shall only be granted for a limited time as determined by CDAEMD. This prohibition does not apply to pre-existing, approved holding tanks whose continued use may be allowed unless the Director determines that the holding tank poses a threat of pollution or risk to public safety. Any change to that approval shall be at the discretion of the Director.

### **SECTION 3I. PORTABLE AND VAULT TOILETS**

Portable Toilets are intended to serve non-residential, limited use activities, such as field labor operations, special events, and temporary construction sites where connection to a sanitary sewer system or installation of an OWTS is not practicable. Portable Toilets must be removed within seven (7) days of conclusion of operations, events, or construction. Any other use of Portable Toilet(s) will require approval by the Director.

The use of vault toilets or semi-permanent Portable Toilets at a publicly owned, non-residential facility (i.e., seasonal cabins on federal land or state, county or city parks) may be allowed by CDAEMD where the vault toilet or semi-permanent Portable Toilet is necessary for the public health, safety, or welfare, and where installation of an OWTS is not feasible, and a vault toilet or semi-permanent Portable Toilet is determined by CDAEMD to provide the safest and most acceptable method of sewage disposal.

Vault toilets may be allowed by CDAEMD when an individual OWTS cannot be constructed. Vault toilets shall meet the following requirements:

- Vaults shall be watertight;
- Vaults shall be maintained to prevent health hazards and Pollution;
- Vaults shall be pumped by a licensed Septic Tank pumper at the end of each season, at a minimum, and pumper's receipt shall be submitted to CDAEMD within thirty (30) days of pumping;
- Plans and specifications for composting or other alternative toilets shall be submitted along with certification from NSF or other organization for review by CDAEMD; and
- Gray water shall be disposed of in a watertight holding tank which shall be pumped out by a licensed Septic Tank pumper or other sub-surface method approved by CDAEMD. Gray water shall not be directly discharged onto the ground surface.

## **SECTION 4 - REPAIR OR ADDITIONS TO EXISTING OWTS**

### **SECTION 4A. COMPLAINT INVESTIGATION PROCEDURES – NOTIFICATION OF FAILURE**

Upon receipt of a complaint report from a member of the public or a notification by a property Owner, Qualified Professional, or Service Provider, a violation file will be generated with an assigned tracking number.

Upon investigation and confirmation of a Failing OWTS, CDAEMD will issue a Notice of Violation directing the property Owner to eliminate the immediate health hazard through pumping of the septic tank by a licensed septic tank pumper or by the elimination of Wastewater flows from the structure. These actions shall continue until the OWTS has been repaired/replaced and final approval granted by CDAEMD. If known, the Notice of Violation shall note why the OWTS is failing and with the specific corrective actions needed. CDAEMD will also require proper destruction of any cesspool found in use by issuing a Notice of Violation directing abatement. A new OWTS will be required for use.

The Notice of Violation shall require repairs to the OWTS, as needed, within a reasonable time frame. An Inspection Report or Warning Notice may also be issued to the property Owner at the time of the site inspection. Subsequently, a Notice of Violation detailing required corrective actions and time frames may be issued if the identified failure cannot be corrected immediately.

The proposed repair/replacement by a property Owner and/or Contractor in an OWTS Permit application shall be evaluated by CDAEMD to ensure it meets the minimum design requirements of the OWTS Manual or that the proposed repair is otherwise in substantial conformance to the greatest extent practicable.

Any OWTS component failure such as a broken distribution box or broken piping connection (a minor failure), shall have that specific component repaired in a timely manner, and inspection from CDAEMD, so as to return the OWTS to proper functioning condition without the requirement to bring the entire OWTS into compliance with the OWTS Manual.

In the event of failure of a Septic Tank (a major failure), such as a baffle, "tee," or loss of structural integrity, Groundwater intrusion, or sewage/Effluent discharge, CDAEMD will require that the Septic Tank be repaired or replaced to bring the tank into compliance with the Septic Tank specifications in the OWTS Manual within a timely manner. An OWTS Permit application will be required and a Permit must be issued by CDAEMD noting the corrections required. The OWTS may not be backfilled or placed into use without an inspection and final approval from CDAEMD.

In the event of the failure of a Supplemental Treatment OWTS or a Dispersal System (a major failure), the Failing OWTS and/or components shall be brought into compliance with the OWTS Manual within a timely manner. Replacement of the Failing OWTS with a Standard OWTS, Special Design OWTS, or OWTS with Supplemental Treatment will be specified in an OWTS Permit issued by CDAEMD. The OWTS may not be backfilled or placed into use without an inspection and final approval from CDAEMD. Supplemental Treatment may be required in situations where ground or surface waters have been impacted by the Failing OWTS.

Soil tests by a Qualified Professional may be required at the discretion of CDAEMD to properly characterize the site with a Failing OWTS. Groundwater separation requirements from the bottom of the Dispersal System and the highest anticipated Groundwater level for repairs are the same as those for newly constructed systems: minimum of five (5) feet (based on soil percolation rates) for standard systems and no less than two (2) feet for systems with Supplemental Treatment and/or an alternate Dispersal System.

Required correction(s) shall be completed under Permit and inspection from CDAEMD within specified time frames. No component of an OWTS shall be backfilled and placed into use until authorized in writing by CDAEMD staff after an inspection confirms substantial compliance with valid CDAEMD Permit conditions and the standards in this OWTS Manual.

#### **SECTION 4B. REPAIR CRITERIA**

A repair of an existing septic OWTS occurs when an OWTS is failing and can include either the Septic Tank or the leach field, or both. A repair Permit is required in order for any Person to install, replace, abandon, or change an OWTS. A separate construction Permit shall be required for expansion purposes or relocation of an OWTS to enable construction of additional structures. A repair does not increase the size capacity of the original OWTS.

#### **SECTION 4C. DESIGN FOR SINGLE FAMILY DWELLINGS**

The Qualified Professional can use any existing records for the parcel that are maintained at CDAEMD (percolation rate, design calculations, and/or original design) to calculate the size and design of the repair. If data are not available a site evaluation and percolation tests will be required.

#### **SECTION 4D. SMALL PARCELS AND LIMITED AREA FOR REPAIR**

Owners of existing developed parcels that do not have adequate area available for a complete OWTS repair may be required to remove minor structures (sheds or other out-buildings) along with trees and other landscaping in order to provide an adequate area for a complete repair. Owners may be advised to consider obtaining an easement from an adjacent property in order to provide adequate area for a complete repair.

If all possibilities for a complete disposal field replacement have been exhausted, an OWTS repair can be approved with the expansion of the disposal field as long as the expansion conforms with this OWTS Manual and the LAMP to greatest extent practicable.

When possible, a diversion valve shall be installed to allow for future use of the existing failing leach line after a drying out period.

Deep trenches shall only be considered after a site inspection by Qualified Professional is performed and it is verified that there is not adequate area available for a typical leach field.

#### **SECTION 4E. REPAIRS FOR COMMERCIAL PROPERTIES**

Repairs for commercial properties shall require a site evaluation by a Qualified Professional that is knowledgeable and experienced in the field of OWTS design and installation.

#### **SECTION 4F. REPAIRS USING PUMP SYSTEMS**

The repaired pump system operation shall be inspected during the final inspection of the OWTS. If the pump system is not operational at the time of the final inspection, an additional inspection and fee shall be required. The pump system inspection is a joint inspection conducted by CDAEMD and the Qualified Professional or the Contractor.

Electrical components and connections of a repair shall be permitted and inspected by the CDADSD. Repair Permit will not receive final approval by CDAEMD until final approval of the electrical permit by the CDADSD.

#### **SECTION 4G. ABANDONED SEWERS AND WASTEWATER DISPOSAL FACILITIES**

Every cesspool, Septic Tank, or seepage pit which has been abandoned shall have the lids removed and contents pumped out by a licensed Septic Tank pumper. The empty Septic Tank shall be completely filled with earth, sand, gravel, concrete, or other approved material. The top cover or arch over the cesspool, Septic Tank, or seepage pit shall be removed before filling for inspection by CDAEMD. After the inspection has been completed by CDAEMD, the cesspool, Septic Tank, or seepage pit shall be filled to the level of the top of the ground.

Where OWTS are abandoned consequent to connecting any premises with the public sewer, the OWTS shall be properly abandoned as required by CDAEMD within thirty days (30) from the time of connecting to the public sewer.

#### **SECTION 4H. REPORTING TO OWNERS OF PUBLIC WATER SYSTEMS AND DIVISION OF DRINKING WATER AT THE SWRCB**

CDAEMD shall notify the Owner of a public well or water intake and the Division of Drinking Water at the SWRCB as soon as is practicable, but not later than seventy-two (72) hours, upon verification of a major failure of an OWTS component within:

- 150 feet of a public water well; and
- Within 2,500 feet from a public water system surface water intake.

Additionally, CDAEMD will notify the public water system prior to the issuance of a new installation or repair Permit for an OWTS if a surface water intake is within twelve hundred (1,200) feet of a proposed OWTS, is within the drainage catchment of the intake point, and is located such that it may impact water quality at the intake point or if the proposed OWTS is within the horizontal sanitary setback from a public well. Notification is to be made by CDAEMD upon receipt of an application for a new or repair Permit and prior to issuance of the Permit. Notifications will be made via email or United States mail, or other means that may be available in the future.

For OWTS Permit applications for Dispersal Areas within the horizontal sanitary setback of a public well or a surface water intake point, CDAEMD shall first work with the Owner of the proposed OWTS to see if relocation of the Dispersal Area is possible. Per the State OWTS Policy, an OWTS with Supplemental Treatment for nitrogen reduction and Supplemental Treatment for pathogen reduction may be required if the Dispersal System cannot be relocated to meet the required setback.

## SECTION 5 – DEFINITIONS

In addition to the definitions provided in the LAMP, the following definitions apply for purposes of this Manual:

**American Society for Testing Materials (ASTM):** A technical organization which publishes national standards for the testing and quality assurance of construction materials.

**Absorption Area:** The sidewall area of a trench below the distribution pipe, except for gravel-less chambers which include both the sidewall area and the trench bottom.

**Applicant:** An Owner or Owner's authorized representative.

**Bedrock:** The rock, usually solid, that underlies soil or other unconsolidated surface material.

**Bedroom:** Any room designated as such by the CDADSD.

**Commercial Facility:** Any structure or building, (excluding single-family and multi-family residential Dwellings), or any portion thereof, intended for commercial or industrial use.

**Contractor:** A Person who possesses an active Class A, B-1 or C-42 contractor's license in accordance with the provisions of the California Business and Professions Code.

**County:** County of El Dorado

**Cut:** Any altered area of land surface having a distinctly greater slope than the adjacent ground surface, over 24 inches in vertical height or the OWTS Dispersal System backfill cover depth, whichever is greater, and any part of which is lower in elevation than the ground surface at the nearest point of the OWTS. Cuts supplied by retaining walls or other similar structures shall be included in this definition, as shall be steep natural ground surfaces where a sharp break in the ground slope is discernable.

**Director:** The Director of the El Dorado County, Community Development Agency, Environmental Management Division, or designee.

**Dispersal System:** A leachfield, seepage pit, mound, at-grade, subsurface drip field, evapotranspiration and infiltration bed, or other type of system for final wastewater treatment and subsurface discharge.

**Disposal Area:** The entire area used for underground dispersion of the liquid portion of Wastewater.

**Drain Rock:** Clean, sound gravel or crushed rock ranging in size from 3/4 to 1-1/2inch diameter with <5% outside this range. Rock and gravel shall contain no more than 1% fines, dust, sand, or clay by weight (less than 1% by weight passing the #200 sieve).

**Dwelling:** Any structure or building or any portion thereof, which is used, intended, or designed to be occupied for human living purposes including, but not limited to, houses, manufactured homes, houseboats, boathouses, mobile homes, travel trailers, hotels, motels, and apartments.

**Effective Soil Depth:** The depth of soil material from ground surface that effectively provides filtration of effluent. Effective soil excludes soil layers that meet the criteria for soil with rapid permeability (<5 MPI.), Groundwater conditions associated with saturation and limiting layers" (<15% porosity).

**Effluent:** The partially treated, liquid portion of Wastewater.

**Ephemeral Stream:** A stream, or other drainage such as a roadside ditch, that flows for less than five (5) days after the passage of a storm. An ephemeral stream only carries water in direct response to a precipitation event and it contains no water from a spring, snow, or other long-continuing surface source and does not discharge to a perennial aquifer.

**Failing OWTS:** The ineffective dispersal of waste resulting in the surfacing of sewage or inadequately treated sewage Effluent and/or the degradation of surface or groundwater quality.

**Gray Water:** Untreated Wastewater that has not come into contact with toilet wastes. It includes used water from bathtubs, showers, bathroom washbasins, and from clothes washing machines and laundry tubs. It does not include Wastewater from kitchen sinks, dishwashers or laundry water from soiled diapers.

**Groundwater:** A layer or lens of soil or fractured Bedrock in which all open spaces are filled with water. The thickness and extent of Groundwater may vary seasonally or periodically in response to changes in the rate or amount of Groundwater recharge or discharge.

**Medium:** Drain Rock, chambers, EZflow or other approved material used to fill the void of a dispersal trench.

**Owner:** Any Person who alone, or jointly, or severally with others:

- a. Has legal title to any single lot, Dwelling, Dwelling unit, or Commercial Facility.
- b. Has care, charge, or control of any real property as agent, executor, executive administrator, administrative trustee, commercial lessee, or guardian of the estate of the holder of legal title; or the Owner's authorized representative.

**Perennial Waterway:** A stream or other drainage which has continuous flow in all or parts of its stream bed all year during normal rainfall years but may flow only intermittently in drought years.

**Permit:** A written document issued by CDAEMD that allows the construction, installation, use, repair, expansion, replacement, or destruction of an existing OWTS or any part thereof.

**Person:** Includes individuals, corporations, associations, firms, partnerships, joint stock companies, public and municipal corporations, political subdivisions, cities, counties, the State and any agencies thereof, and the Federal government and any agencies thereof.

**Pipe Fitting Distribution (Crossover Unit):** A series of pipefittings connected to the distribution pipe providing serial distribution of Effluent in the disposal field.

**Pollution:** The undesirable change in the physical, chemical, or biological characteristics of air, land, and water that may or will harmfully affect human life or that of other desirable species, industrial processes, living conditions, and cultural assets; or that may or will waste or deteriorate raw material resources.

**Public Entity:** A local agency that is empowered to plan, design, finance, construct, operate, maintain, and to abandon, if necessary, any OWTS or the expansion of any Wastewater treatment facilities serving a land development as defined in the State of California Government Code Section 53090.

**Qualified Professional:** An individual licensed or certified by a State of California agency to design OWTS and practice as a professional for other associated reports, as allowed under his/her license or registration. Depending on the work to be performed and various licensing and registration requirements, this may include an individual who possesses a Registered Environmental Health Specialist certificate or is currently licensed as a professional engineer or professional geologist. For the purposes of performing site evaluations, soil scientists certified by the Soil Science Society of America are considered Qualified Professionals. Qualified Professionals would be expected to conduct onsite surveys for OWTS suitability, evaluate potential pathways of Wastewater-sourced phosphate and other nutrients toward potentially threatened nearby wells or surface bodies of water, consider hydraulic mounding and linear loading at the site, complete all necessary soils tests, prepare system designs and drawings, meet with Owners and Contractors, and conduct necessary inspections. No other Person, license, or registration/certification will be approved as a Qualified Professional.

**Replacement Area:** An area that is one hundred (100) percent in size of the area approved for the initial sewage system disposal field for a residence and three hundred (300) percent in size of the area approved for the initial sewage system disposal field for others.

**Septic Tank:** A water tight, covered receptacle designed for primary treatment of wastewater and constructed to:

1. Receive wastewater discharged from a building or other use;
2. Separate settleable and floating solids from the liquid;
3. Digest organic matter by anaerobic bacterial action;
4. Store undigested solids; and
5. Clarify wastewater for further treatment/subsurface discharge.

**Service Provider:** A Person approved by CDAEMD who is capable of operating, monitoring, inspecting and maintaining an OWTS in accordance with this OWTS Manual.

**Single Family Dwelling:** A Dwelling designed for and commonly occupied exclusively by one family and served by one OWTS.

**Slope:** The rise or fall of vertical elevation in feet, per one hundred (100) feet of horizontal distance. Slope is expressed as a percent of grade. For example, a rise of 30 feet in a 100 foot run is a 30 percent slope. A rise of 40 feet in a 100 foot run is a slope of 40 percent.

**Soil:** The naturally occurring body of porous mineral and organic materials on the land surface, which is composed of unconsolidated materials, including sand-sized, silt-sized, and clay-sized particles mixed with varying amounts of larger fragments and organic material. The various combinations of particles differentiate specific soil textures identified in the soil textural triangle developed by the United States Department of Agriculture (USDA) as found in Soil Survey Staff, USDA; *Soil Survey Manual, Handbook 18*, U.S. Government Printing Office, Washington, DC, 1993, p. 138. For the purposes of this OWTS Manual, soil shall contain earthen material of particles smaller than 0.08 inches (2 mm) in size.

**Soil Observation Pit:** An excavation of sufficient size and depth to allow thorough examination of the soil to evaluate its suitability for Wastewater disposal.

**Special Design OWTS:** OWTS that does not meet the criteria for a State OWTS Policy Tier 1 Standard OWTS.

**Standard OWTS:** An OWTS constructed in soil meeting State OWTS Policy Tier 1 specifications. A Standard OWTS consists of a Septic Tank and a series of subsurface dispersal trenches for subsurface dispersal of Effluent into the soil. A Standard OWTS may utilize gravity flow or a pump OWTS to convey Effluent from the Septic Tank to the drain field.

**Supplemental Treatment:** Any OWTS or component of an OWTS, except for a septic tank or dosing tank, that performs additional Wastewater treatment using intermittent and recirculating sand filters, proprietary treatment units, and other alternative treatment systems approved by the Director, so that the Effluent meets a predetermined performance requirement prior to discharge of the Effluent into the dispersal field. Some Supplemental Treatment units are passive and can be placed directly onto a leach bed for direct dispersal into the soil.

**Tight Line:** The solid distribution pipe that conveys the Effluent from the Septic Tank to the disposal field including the distribution laterals.

**Wastewater:** Blackwater, Gray Water, and/or any liquid contaminated with materials thereof.

**Water Table:** That level of Groundwater where the hydraulic pressure is zero.