Purpose:

The purpose of the information provided in this manual is to assist the contractor, designer, engineer and installer in the design and installation of Onsite Wastewater Treatment Systems (OWTS) in Riverside County.

Both conventional OWTSs and Alternative systems, including systems that provide advanced treatment beyond what the conventional systems are designed to accomplish, are discussed.
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DEFINITIONS

“Alternative System” or “Alternative OWTS” shall mean any Onsite Wastewater Treatment System (OWTS) that does not meet the criteria of a conventional OWTS, but is allowed under conditions specified by the Department.

“Approval” shall mean the written approval by the Director or his designated representative of a plan to install, construct, reconstruct, convert or alter any OWTS which discharges or disposes of sewage, sewage effluent, or non-hazardous waste.

“Contractor State License Board” means a certificate, permit, registration, or any other authorization issued by the Contractor State License Board, Department of Consumers Affairs.

“Conventional Septic System” shall mean an OWTS consisting of a septic tank and a Department approved subsurface gravity dispersal system.

“Critical Area” shall mean those areas determined by the Director to be difficult for installation of an OWTS due to, but not limited to one or more of the following: lot size, seasonal groundwater, slope, presence of shallow soils or poor soil conditions.

“Deep Boring” means an exploratory boring or excavation performed to provide additional information including soil type, moisture, depth to the water table, perched or otherwise, rock or an impervious strata.

“Department” shall mean the Riverside County Department of Environmental Health.

“Director” shall mean the Director of the Department of Environmental Health or designee.

“Dispersal System” shall mean the trench, seepage pit, mound, drip irrigation or evapotranspiration and absorption system for final wastewater treatment and subsurface discharge.
“Effluent” is an outflow from a sewer or sewer system, or a discharge of liquid waste.

“Expansion Area” shall mean the amount of dedicated space equal in size to an existing or proposed OWTS that is capable of supporting an OWTS and will replace the primary OWTS when necessary.

“Graywater” is untreated household wastewater that has not come into contact with toilet waste. Grey water includes used water from bathtubs, showers, and bathroom wash basins, and water from clothes washers and laundry tubs. It shall not include wastewater from kitchen sinks or dishwashers.

“Holding Tank” shall mean a sewage facility, of a temporary nature, that has no means of discharge and requires periodic maintenance and shall have a renewable operating permit issued by the Department.

“Leaching Bed” shall mean a single excavation wherein leach lines are installed without individual trenches. Leach beds shall provide 50% greater bottom area than required for a leach line trench system.

“Major Repair” shall mean OWTS improvements or corrective work where such improvements involve the replacement, enlargement, or modification of a septic tank, treatment unit, or dispersal system (excluding non-perforated distribution pipes), regardless of whether or not a failure condition exists. Such repairs shall require a construction permit from the Department.

Note: All major repairs may be only be performed by a registered QSP that also holds a current C-42, C-36 and/or Class A General Contractor’s License issued by the State of California.
**Exception:** A homeowner may conduct a major repair under a Tier 1 Low Risk New or Replacement OWTS as defined by the Water Quality Control Policy for Siting and Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems by the State Water Resources Control Board.

“Onsite Wastewater Treatment System(s)” (OWTS) shall mean any individual or community onsite wastewater treatment, pretreatment and dispersal system including, but not limited to, a conventional or alternative OWTS having a subsurface discharge.

“Operating Permit” shall mean an annual permit issued by the Department authorizing the permittee to operate an OWTS.

“Percolation Test” (Perc Test) means a method of testing water absorption of the soil. The test is conducted with clean water and test results can be used to establish the dispersal system design.

“Permit” shall mean either a construction permit or operating permit as defined within this section.

“Person” shall mean any person, firm, partnership, corporation, association, club or organization.

“Professional of Record” means an individual certified by the State of California as a Professional Engineer (PE), Professional Geologist (PG) or Registered Environmental Health Specialist (REHS) who has accepted responsibility for the design of the OWTS including any required grading. The Professional of Record will have affixed his/her signature and stamp to the system plans and plan proposal.

“Qualified Service Provider” (QSP) is a State Licensed Contractor with knowledge and competency in OWTS design, construction, operation, maintenance and monitoring through
experience and/or education. Effective January 1, 2007, and thereafter a qualified service provider must meet certification requirements as established by the Director.

“Sewage” is any liquid waste containing animal or vegetable matter in suspension or solution and that may include liquids containing chemicals in solution.

“Soil” is the naturally occurring body of porous mineral and organic materials on the land surface, and is composed of unconsolidated materials above bedrock. Soil is composed of 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 USDA Soil Classification Chart. Soil shall contain earthen material having more than 50% of its volume composed of particles smaller than 0.08 inches (2mm) in size.

“System Certification” is an expression of professional opinion that the OWTS, or its components, meet industry standards that are the subject of the certification but do not constitute a warranty or guarantee, either express or implied. System Certifications shall be performed by a QSP using forms and procedures established or approved by the Director.


“Wastewater” means any and all waste or substance, liquid or solid, associated with human habitation or which contains or may be contaminated with human or animal excreta, excrement, offal or any feculent matter or matters, or substances that may be injurious or dangerous to health, either directly or indirectly.

“Weathered Bedrock” is rock that has been exposed to the atmosphere at or near the earth’s surface and changed in color, texture, composition, firmness, and/or form as a result of the
exposure with little or no transport of loosened or altered material. For purposes of this Ordinance, weathered bedrock is not soil.
An Onsite Wastewater Treatment System (OWTS) Report for Land Divisions is required for all proposed Tract and Parcel Maps (all Planning schedules) that will utilize an OWTS for sewage disposal. The OWTS Reports for Land Divisions will only be accepted by the Department if they are prepared by certain professionals. Only the grading engineer, who has expertise in designing on-site wastewater systems or the professional who performed the actual Percolation Test (Perc Test) can prepare the OWTS Report. The professional that prepares the report must possess at least one of the following current and valid California registrations:

- Registered Civil Engineer (RCE)
- Registered Engineering Geologist (REG)
- Registered Environmental Health Specialist (REHS)

The Report shall include, but not be limited to the following:

1) Location of the land, legal description and the Riverside County Assessor’s Parcel Number (APN).
2) Client’s name, address and phone number.
3) Type of proposed development and number of lots.
4) Types of OWTSs, i.e. conventional gravity, pumped, leach lines, seepage pits, etc.
5) Detailed description of the property including the following items:
   a) Describe the corner stake locations in relation to other natural or manmade landmarks on the property. Note: Riverside County Subdivision Ordinance 460, Section 4.2 states: “Prior to filing a Tentative Map, the land developer shall place a conspicuous stake identified with a number or corner description and flag (brightly colored tape or ribbon) at each approximate corner of the property proposed to be subdivided.”
   
   b) The Professional of Record shall be able to accurately locate the property to be tested and the corner stakes shall be in place as noted above before any work is performed on site. A durable sign, with the owner’s or engineer’s name along with the legal description of the property must be placed in a conspicuous spot visible from the street or street easement.
   
   c) A general description of surface features which may interfere with the placement or operation of the OWTS.

6) Contour Map

   Tentative Subdivision and Parcel Maps shall have maximum contour intervals as follows:

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<tr>
<th>Slope</th>
<th>Interval</th>
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<tr>
<td>0-2%</td>
<td>5 foot maximum</td>
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<tr>
<td>3-9%</td>
<td>5 foot maximum</td>
</tr>
<tr>
<td>10% or greater</td>
<td>10 foot maximum</td>
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Note: Copies of United States Geological Survey Maps are not acceptable for this purpose.

7) Site Plan
   a) Each lot site plan on the tentative map shall include the following features:
   b) All intermittent or perennial, natural or artificial bodies of water or watercourses.
   c) All large trees and significant vegetation.
   d) All existing structures.
   e) All existing wells or remnants of wells, on or within 200 feet of the map boundaries.
   f) Proposed or existing domestic water service lines or water mains.
   g) All rock outcroppings.
   h) Indicate where all tests and borings were performed and the identifying markings on the corresponding field laths.
   i) All tests and borings must be accurately dimensioned to the property lines.

8) Grading Plans and Requirements

   If grading plans are required, the plans must be designed by a Registered California Civil Engineer and meet the requirements of the Riverside County Department of Building and Safety.

   If grading is contemplated, the professional noted above shall assume theoretical cuts and fills and perform the tests and borings at the necessary depths. If the final grading exceeds the testing professional’s estimate by more than plus or minus 2 feet, an additional test may be required.

   Grading plans shall be included in the OWTS Report under the following conditions:

   a) Whenever any area of the site has a gradient of 5% or more, as measured between natural contours;

   Or

   b) When the Professional cannot state that there is sufficient area of natural undisturbed soils at the depth of his/her tests to install the systems outside of the cut and fill area.

   The grading plans shall include any proposed cuts and/or fills in the area of the proposed OWTS as well as indicate the proposed locations of both the primary and expansion area for the OWTS.

9) Perc Test

   A minimum of one perc test and one boring shall be performed on each lot within the proposed land division. The tests must be conducted in the area where the systems will be placed based on preliminary information at the time of the testing.
Prior to the commencement of the perc test, the Professional of Record shall give notification of the time and place of the test to the Department at least two business days in advance. The Department will issue a confirmation number to the Professional of Record which will serve as proof of this notification. This confirmation number must be incorporated into the soils percolation report on the cover sheet published by the Professional of Record. If the Department is not present at the prescribed time that the test is to be conducted, the professional may proceed without the Department representative being present. The testing, however, must be conducted in conformance with these regulations. Refer to Chapter 3 for perc test procedure details and requirements.

10) Preliminary Recommendations

Preliminary recommendations for each lot shall include, but not be limited to, the following:

a) Design rate in minutes/inch converted to square feet/100 gallons of septic tank capacity for leach lines, and/or in gallons per square foot converted to vertical feet of seepage pit per 100 gallons of septic tank capacity (specify 5 or 6 foot diameter) for both the primary and expansion systems.

b) Location of the systems.

Note: If possible, the septic tank should be located in the front yard. This helps to accommodate servicing and facilitates an eventual connection to sewer if it becomes available.

c) Depth of systems. Recommendations should correspond to depth of tests. Maximum depth of leach line or pit should be stated. Effective sidewall of seepage pit must correspond to testing depths.

d) Special designs, if necessary. Examples include additional separation of pits or lines, amount of rock below line in excess of required code, chamber type line, non-conventional pumped, advance treatment, etc.

e) A statement as to whether or not there will be sufficient usable space available on every lot - in addition to the areas set aside for the primary and expansion systems – for the installation of swimming pools or other large structures.

f) Conclusions. The following declarations shall be incorporated into the conclusion section of the OWTS report:

i. “Based on the data presented in this report and using the recommendations set forth, it is the judgment of this professional that there is sufficient area on each lot to support a primary and expansion OWTS that will meet the current
standards of the Department of Environmental Health and the Regional Water Quality Control Board (RWQCB).”

ii. “The designed system shall be located in natural undisturbed soil at the depth of the tests performed.”

iii. “The natural occurring body of minerals and organic matter at the proposed wastewater disposal area contains earthen materials having more than 50% of its volume composed of particles smaller than 0.08 inches (2 mm) in size.”

iv. “Based on the data presented in this report and the testing information accumulated, it is the judgment of this professional that the groundwater table will not encroach within the current allowable limit set forth by County and State requirements.”

Note on groundwater statement:

When no groundwater is detected in the 15 foot boring, this statement can be made with a reasonable amount of certainty. However, when groundwater is present in the borehole it then becomes necessary to demonstrate with additional facts and findings, why this water level won’t fluctuate to the point of encroachment. To fail to explore the possibility that detected groundwater could interfere with the OWTS, or violate the RWQCB’s Basin Plan would not be in keeping with good engineering practices.

Therefore, when a Professional of Record submits a report that shows groundwater in the boring, the standard statement (above (10)(f)(iv)) is not sufficient. The Professional of Record must specifically address with pertinent facts and findings why he or she believes this to be the case. This could include information such as historical data from adjacent wells, monitoring over an extended period of time (as through a rainy season), soil mottling, other visual clues in the soil profile, or any other data that could support the conclusion.

Disclaimer:

County approval of a tract or parcel map, even after a preliminary review by the Department, is no guarantee that an OWTS permit can be issued for an individual lot. Suitability for OWTS use on a lot can only be determined by a full OWTS Report investigation of that lot.
CHAPTER 2  ONSITE WASTEWATER TREATMENT SYSTEM REPORT FOR SINGLE LOTS

An Onsite Wastewater Treatment System (OWTS) Report is required for design of an OWTS for all single lot developments (except for specified areas in the Coachella Valley). The connection to a sanitary sewer may be required, if the system is available (accessible) as specified in the current version of the UPC.

The OWTS Reports for single lots will only be accepted by the Department if they are prepared by certain professionals. Only the grading engineer, who has expertise in designing on-site wastewater systems or the Professional who performed the actual Percolation Test (Perc Test) can prepare the OWTS Report. The professional that prepares the report must possess at least one of the following current and valid California registrations:

- Registered Civil Engineer (RCE)
- Registered Engineering Geologist (REG)
- Registered Environmental Health Specialist (REHS)

The Report shall include, but not be limited to the following:

1) Location of the land, legal description and the Riverside County Assessor’s Parcel Number (APN).
2) Client’s name, address and phone number.
3) Type of proposed development and number of lots.
4) Types of OWTS, i.e. conventional gravity, pumped, leach lines, seepage pits, etc.
5) Detailed description of the property including the following items:
   a) Describe the corner stake locations in relation to other natural or manmade landmarks on the property.
   b) The Professional of Record shall be able to accurately locate the property to be tested and the corner stakes shall be in place as noted above before any work is performed on site. A durable sign, with the owner’s or engineer’s name along with the legal description of the property must be placed in a conspicuous spot visible from the street or street easement.
   c) A general description of surface features which may interfere with the placement or operation of the OWTS.
6) Contour Map

Map shall have maximum contour intervals as follows:

<table>
<thead>
<tr>
<th>Slope</th>
<th>Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2%</td>
<td>5 foot maximum</td>
</tr>
<tr>
<td>3-9 %</td>
<td>5 foot maximum</td>
</tr>
<tr>
<td>10-45% or greater</td>
<td>10 foot maximum</td>
</tr>
</tbody>
</table>

Note: Copies of United States Geological Survey Maps are not acceptable for this purpose.
7) Site Plan
   a) Each single lot shall have a site plan.

   b) The site plan shall be drawn to an appropriate engineering scale. (Typically 1"=20’ or 1"=40’).

   c) The site plan will overlay the contoured map and include the following features.

   i. All intermittent or perennial, natural, or artificial bodies of water or watercourses.

   ii. All large trees and significant vegetation.

   iii. All existing structures on the lot.

   iv. All proposed structures including driveways, patios, pools, sidewalks etc. (number of bedrooms for homes).

   v. All existing wells or remnants of wells, on or within 200 feet of the property boundaries.

   vi. Proposed domestic water service lines, and proposed or existing water mains.

   vii. All rock outcroppings.

   viii. Indicate where all tests and borings were performed on the property.

   ix. All tests and borings must be accurately dimensioned to the property lines.

   x. Ornamental ponds.

   xi. All known recorded easements on or within 20 feet of lot boundaries (open space, utilities, etc.), or any other environmental constraints assigned to the proposed map.

   xii. A cross section that clearly calls out the elevations between the primary systems components.

   xiii. The elevation of the individual building pads in reference to the elevation of the sewage system (i.e., tank inlet, D-Box inlet, and leach line or seepage pit inlet).

   xiv. Purpose of project (e.g., new dwelling, new structure, guesthouse, addition, etc.).
8) Grading and Grading Plans

If grading is contemplated, the engineer must assume theoretical cuts and fills and perform the tests and borings at the necessary depths. If the final grading exceeds the testing professional’s estimate by more than plus or minus 2 feet, an additional test may be required.

The following information shall be shown on all grading plans:

a) The anticipated cuts and/or fills in the area of the proposed OWTS.

b) Both primary and expansion OWTS.

c) The elevation of the individual building pads in reference to the elevation of the sewage system (i.e. tank inlet, D-Box inlet, leach line, or seepage pit inlet).

d) When the grading plan is prepared by other than the person preparing the OWTS Report, the Professional of Record for the OWTS Report must use the finished grading contours as a basis for his site plan (i.e., the site plan must incorporate the finish contours).

9) Perc Test

Leach fields require a minimum of four perc tests and one deep boring.

Seepage pits require a minimum of two perc tests and one deep boring.

The tests must be conducted on the lot in the area where the system will be proposed.

Prior to the commencement of the percolation tests, the Professional of Record shall notify the Department of the time and place of the test at least two business days in advance. The Department will issue a confirmation number to the Professional of Record which will serve as proof of this notification. This confirmation number must be incorporated into the soils percolation report on the cover sheet published by the Professional of Record. If the Department is not present at the prescribed time that the test is to be conducted, the professional may proceed without the Department representative being present. The testing, however, must be conducted in conformance with these regulations. Refer to Chapter 3 for Perc Test procedure details and requirements.

10) Design recommendations including but not limited to the following:

a) Design rate in minutes/inch converted to square feet/100 gallons of septic tank capacity for leach lines, and/or in gallons per square foot converted to vertical feet of pit per 100 gallons of septic tank capacity (specify 5 or 6 foot diameter) for seepage pits, for both the primary and expansion systems.

b) The location of the systems.
Note: If possible, the septic tank should be located in the front yard. This helps to accommodate servicing and facilitates an eventual connection to sewer if it becomes available.

c) Depth of systems. Recommendations should correspond to depth of tests. Maximum depth of leach line or pit should be stated. Effective sidewall of seepage pit must correspond to testing depths.

d) Special design, if necessary. For example, additional separation of pits or lines, amount of rock below line in excess of required code, chamber type line, non-conventional pumped, advanced treatment, etc.

e) Conclusions. The following declarations shall be included in the conclusion section of the OWTS Report:

i. “Based on the data presented in this report and using the recommendations set forth, it is the judgment of this professional that there is sufficient area on each lot to support a primary and expansion OWTS that will meet the current standards of the Department of Environmental Health and the Regional Water Quality Control Board (RWQCB).”

ii. “The designed system shall be located in natural undisturbed soil at the depth of the tests performed.”

iii. “The natural occurring body of minerals and organic matter at the proposed wastewater disposal area contains earthen materials having more than 50% of its volume composed of particles smaller than 0.08 inches (2 mm) in size.”

iv. “Based on the data presented in this report and the testing information accumulated, it is the judgment of this professional that the groundwater table will not encroach within the current allowable limit set forth by County and State requirements.”

Note on groundwater statement:

When no groundwater is detected in the 15 foot boring, this statement can be made with a reasonable amount of certainty. However when groundwater is present in the borehole it then becomes necessary to demonstrate with additional facts and findings, why this water level won’t fluctuate to the point of encroachment. To fail to explore the possibility that detected groundwater could interfere with the OWTS, or violate the RWQCB’s Basin Plan would not be in keeping with good engineering practices.

Therefore, when a Professional of Record submits a report that shows groundwater in the boring, the standard statement (above (10)(e)(iv)) is not sufficient. The Professional of Record must specifically address with pertinent facts and findings why he or she believes this to be the case. This could include information such as historical data from adjacent wells, monitoring over an extended period of time (as through a rainy season), soil mottling, other visual clues in the soil profile, or any other data that could support the conclusion.
CHAPTER 3  PERCOLATION TESTING

Only those individuals trained and educated to perform, understand and evaluate the field conditions and tests, as they relate to OWTS may perform these tests. This would include those with experience in OWTS design and hold one of the following State of California credentials and registrations: PE, PG and REHS. The Department will only approve the percolation test method described in this Chapter. The use of the “continuous pre-soak procedure” is no longer accepted.

Prior to the commencement of the perc test, the Professional of Record shall give notification of the time and place of the test to the Department at least two business days in advance. The Department will issue a confirmation number to the Professional of Record which will serve as proof of this notification. This confirmation number must be incorporated into the soils percolation report on the cover sheet published by the Professional of Record. If the Department is not present at the prescribed time that the test is to be conducted, the professional may proceed without the Department Representative being present. The testing however must be conducted in conformance with these regulations.

When the percolation testing has been completed, a 3 foot long surveyor’s stake (lath) shall be flagged with highly visible banner tape and placed in the location of the test indicating date, test number as shown on the field data sheet, and firm performing the test.

The percolation report shall include the following:

1) Date of testing.

2) Type of equipment used to construct the boreholes, such as backhoe, hollow stem auger, etc.

3) Delineation of any special calculations such as gravel correction factor (if used).

4) Test results shall be provided in tabular format showing the following: Test number, rate in minutes/inch and square feet per 100 gallons of septic tank capacity for leach lines and/or rate in gallons per square foot per day for seepage pits., depth of test and soils classification. Refer to Appendix 4 for sample test forms.

5) Field percolation test data including date, time of day, presoak description, and location of hole with respect to property lines or other landmarks.

Standard Percolation Tests Procedures for Leach Lines

1) Test hole opening shall be between 8 and 12 inches in diameter or between 7 and 11 inches on side if square.

2) The depth of the hole shall correspond to the depth of the proposed leach line trench.
3) The bottom of the test hole shall be covered with 2 inches of gravel.

4) Pre-soaking

   a) Invert a full 5 gallon bottle of clear water supported over the hole so that the water
      flow into the hole holds constant at least 8 inches above the gravel at the bottom
      of the hole. Testing shall commence after all of the water has percolated through
      the test hole or after 15 hours has elapsed since initiating the pre-soak.

5) The sides of the hole shall remain undisturbed (not smeared) after drilling and any
   cobbles encountered left in place.

Special Testing for Critical Areas for Leach Line Design

Deep percolation test procedures shall be used where an impermeable strata has been
encountered. The Professional of Record shall demonstrate that an impermeable strata (i.e.
bedrock, etc.) condition does not exist within a distance of 8 feet below the proposed leach line
trench bottom. These standards allow the professional to demonstrate conformance with this
criterion by testing to insure that the impermeability at this depth does not exceed 120 minute per
inch.

In Critical Areas, the professional shall perform two additional percolation tests at a depth of 8
feet below the trench bottom. In preparation for the testing, 10 gallons of water must be used to
presoak each of these two test borings. The pre-soak period is not to extend beyond 48 hours
and testing must commence as soon as practicable after all water has drained, or at the most 48
hours. For these deep percolation tests, measurements shall be taken at 30 minute intervals over
a 6 hour period. The location of the test borings must be in the area on the site where the system
will ultimately be placed.

If partially decomposed, or unaltered rock or shale materials are encountered in the site trench,
the professional will evaluate any fissuring (extent and orientation), and make a conclusive
statement addressing the ability of the underlying materials to accept and effectively convey the
hydraulic loading from the system and the seasonal average rainfall.

Perc Test Measurements for Leach Line Design

In sandy soils when two consecutive measurements show that 6 inches of water seeps away in
less than 25 minutes, the test shall be run for an additional hour with measurements taken every
ten minutes. The drop that occurs during the final ten minutes should be used to calculate the
percolation rate. Field data must show the 2 – 25 minute readings and the 6 – 10 minute
readings.

In non-sandy soils, if all of the water has percolated either while the tester is present or after 15
hours, remove the bottle and add water until the level is 6 inches above the gravel at the bottom
of the test hole. Obtain a minimum of six measurements per hole over 6 hours with a precision
of at least 0.25 inches. Refill to 6 inches over the top of the gravel after each measurement.
Intervals between readings shall be not less than 30 minutes. The drop that occurs during the final reading should be used to calculate the percolation rate. To assure saturated conditions, if no water remains in the hole after the initial soaking, testing must start no later than 26 hours after that soaking.

The field results are to be reported in minutes per inch (minutes/inch). This then corresponds to the leach line trench bottom area in square feet for every 100 gallons of septic tank capacity. The conversion is provided in Table 3.1.

<table>
<thead>
<tr>
<th>Minutes / Inch</th>
<th>Minimum Sq. Ft. per 100 Gallons</th>
<th>Minutes / Inch</th>
<th>Minimum Sq. Ft. per 100 Gallons</th>
</tr>
</thead>
<tbody>
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<td>0-9</td>
<td>20</td>
<td>26-27</td>
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<tr>
<td>17-18</td>
<td>40</td>
<td>38-43</td>
<td>90</td>
</tr>
<tr>
<td>19-20</td>
<td>45</td>
<td>44-48</td>
<td>100</td>
</tr>
<tr>
<td>21-23</td>
<td>50</td>
<td>50-54</td>
<td>110</td>
</tr>
<tr>
<td>24-25</td>
<td>55</td>
<td>55-60</td>
<td>120</td>
</tr>
</tbody>
</table>

Percolations Test Procedures for Seepage Pit Design

1) Borehole diameter shall be either 6 inch or 8 inch only. No other diameter test holes will be accepted.

2) The test depth shall be at the intended depth of the seepage pit. No pits will be allowed shallower than 10 ft. below inlet or deeper than 40 ft. below ground surface.

3) Fill the hole with clear water to a maximum depth of 4 feet below the surface of the ground or if grading cuts are anticipated, to the depth of the assumed inlet of the proposed seepage pit.

Percolation Test Measurements for Seepage Pit Design

1) All holes shall be pre-soaked for 24 hours unless the site consists of sandy soils containing little or no clay. If sandy soils exist and the water on two consecutive readings seeps away faster than half the wetted depth in 25 minutes or less, the tests may then be run after a 2 hour pre-soak.

2) Except in sandy soils, the percolation rate measurement shall be made on the day following the pre-soak as described in Item (A) above; adjust water depth to the proposed inlet depth.
From a fixed reference point, measure the drop in water level over a 30 minute period for at least 6 hours, refilling after every 30 minute reading. The total depth of hole must be measured at every reading to verify that collapse of the borehole has not occurred.

3) In sandy soils, the time interval between measurements shall be 10 minutes and the test run for 1 hour. This does not include the 2 consecutive fillings as described in item (A) above which are considered part of the pre-soak.

4) The seepage pit percolation rate shall be calculated in the following manner:

\[
Q = \frac{F/T}{L} \times (D \times 9) \quad \text{Or} \quad Q = \frac{(R)(D)(9)}{L \text{ Avg.}}
\]

Where \( R = \frac{F}{T} \) in \( \text{Ft/Hr} \).

a) \( Q \) = Rate in gallons/sq. ft. of sidewall per day of septic tank effluent.

b) \( F \) = Drop during time interval in feet.

c) \( T \) = Time interval in hours.

d) \( D \) = Diameter of hole in feet.

e) \( L \text{ Avg.} \) = Average wetted depth during time interval in feet. Minimum depth is 10 feet.

The seepage pit depths (below the inlet) for 5 ft. and 6 ft. diameter pits are derived from the rate \( Q \) in the following manner:

f) Total depth required for a 5 ft. diameter pit below the inlet = Septic Tank Capacity. /Q x 15.7 (where 15.7 is the circumstance in feet of a 5 foot diameter pit)

g) Total depth required for a 6 ft. diameter pit below the inlet = Septic Tank Capacity. /Q x 18.8 (where 18.8 is the circumstance in feet of a 6 foot diameter pit)

h) The recommended effective sidewall of the seepage pit must correspond to the testing depths.

Refer to the Appendices for example field test forms for seepage pits.

**Exploratory Trench or Deep Borings**

This procedure is used in addition to the standard perc test. An exploratory trench or boring is an excavation or hole drilled in the area of the proposed OWTS. It will be used to provide additional information including: type of soil, soil moisture, depth of the water table, perched or otherwise, rock or impervious soil.
The excavation or boring must extend to a minimum depth of 10 feet below the bottom of the proposed system to determine if the depths of the water table, bedrock, or impervious soils (percolation rate of greater than 120 minutes per inch.), and whether they encroach within the allowable limits. However, the minimum depth of any boring is 15 feet bgs (below ground surface), or stated refusal. The Professional of Record must address all refusals encountered. If water is found, refer to Chapter 4 for additional testing requirements.

For the Department to verify absence of or presence of ground water within the 15 foot boring or excavation, a 4 inch perforated PVC pipe shall be left in place. The excavation or boring with the pipe installed can be back filled. The pipe should be secured to prevent damage or vandalism.
The presence of high groundwater can negatively impact the operation of an OWTS. The elevated groundwater can cause the system to fail and significantly degrade the surrounding groundwater quality that other utilities use as a source of drinking water. In order to determine if groundwater has impacted the site, special testing is required. These areas have been documented as having historically high groundwater. The special testing is also required where high ground water would be anticipated such as in the following areas: near drainage courses, streams, bodies of standing water, and areas of shallow bedrock that allow rapid fluctuating perched water due to water entrapments and poor permeability. The special testing will be used to confirm if groundwater has indeed impacted the site and could preclude the use of a conventional OWTS.

In addition to the normal percolation testing and deep boring procedures described in Chapter 3, the following procedure shall be followed:

An excavation is to be dug with a backhoe or bucket rig capable of allowing access for visual inspection by a qualified individual experienced at evaluating the soil strata for visual signs of mottling and other geological signs to determine historic high ground water levels. The Professional of Record shall give the Department notice of when the excavation will be open for observation. The presence of mottled soil is marked with spots, blotches or contrasting color which is usually caused by saturation for some period during a normal year, unless it has been artificially drained. (If the site has been artificially drained, contact this Department for further evaluation.) This method has been used for many years as a reliable indicator of groundwater encroachment. Refer to the end of this Chapter for a description of the cause of soil mottling development.

Mottling can be described in terms of abundance, size and contrast which are delineated below:

**Abundance:** Few – Occupy less than 2% of the exposed surface.

Common – Occupy from 2 – 20% of the exposed surface.

Many – Occupy more than 20% of the exposed surface.

**Size:** Fine – Less than 1/5 inch in diameter along the greatest dimension.

Medium – From 1/5 to 3/5 inch diameter along the greatest dimension.
Course – Greater than 3/5 inch diameter along the greatest dimension.

Contrast:  
Faint – Evident but recognizable only with close examination.
Distinct – Not striking but readily seen.
Prominent – Obvious, and one of the outstanding features of the horizon.

If soil mottling is found, a conventional system typically cannot be used at this site. Contact your Professional of Record to determine the best course of action.

***************************************************

Special Section

Mottled Soil Development

With ambient temperatures above 40°F, two basic types of bacteria are the agents which decompose or oxidize organic matter in the soil. Aerobic bacteria are the primary agents as long as there is some air present in the soil. As infiltrating water and/or a rise in groundwater fills the air spaces (voids) saturating the soil, air is excluded and anaerobic bacteria become the primary decomposers. They utilize insoluble manganese and iron compounds that are present in the soil instead of air. Chemical reactions occur causing manganese and iron ions to be liberated from the otherwise insoluble oxide and hydroxide compounds and begin to flow through the soil solutions. Since this action drains iron ions, a color reduction occurs in those areas tending to turn them gray or white. When these ions again encounter oxygen in aerated pores, they immediately recombine with air to form yellow, orange and rust colored concentrations. Manganese ions are re-oxidized and form black concentrations. If this process has prevailed for significant periods over recent geologic past, the resulting mottled soil colors can be quite readily observed. Hence, this historic recording of saturation in the soil can be used to estimate the groundwater level expected to occur during a near normal spring season. Experience has shown that this level can be predicted quite accurately at most sites.
CHAPTER 5  DESIGN REQUIREMENTS FOR STANDARD ONSITE WASTEWATER TREATMENT SYSTEMS (OWTS)

Basic Requirements of OWTS Design

1) There shall be a minimum of 5 feet of undisturbed soil between groundwater and the leach lines. A minimum of 10 feet of soil shall be between groundwater and the bottom of a seepage pit.

2) No conventional OWTS shall be allowed in an area where the high water table is less than 10 feet below the existing ground surface except in some areas in the Coachella Valley. The groundwater level can be determined by special testing delineated in Chapter 4.

3) There shall be a minimum of 8 feet of soil between the bottom of the system and an impermeable strata. An impermeable strata shall be defined as any soil strata, fractured rock or bedrock weathered or non-weathered that has a percolation rate in excess of 120 minutes per inch.

4) The soil in the area of the OWTS shall not have a percolation rate slower than 60 minutes per inch for leach lines or 1.1 gallons per square foot of sidewall/day for seepage pits.

5) If the percolation rates are faster than 5 minutes per inch for leach lines or 10 gallons per sq. foot per day for seepage pits, the soil depths required in Section (1) above must contain at least 10% fines smaller than .08 millimeters (fit through a #200 sieve). A minimum of a 40 foot separation between the bottom of the OWTS and the high groundwater table must be maintained if the fines percentage requirement is not met. This assumes that at some depth above high groundwater, there exists 5 feet (for leach lines) or 10 feet (for seepage pits) of soil that has enough fines (#200 sieve) to meet the above requirement.

6) All OWTS shall be so designed that additional dispersal areas equivalent to at least 100% of the required original system shall be provided for on the plot plan. This is called the expansion area.

Septic Tank Design:

All septic tanks shall be in conformance with the current edition of the UPC. The tank shall be equipped with at least two risers: one at the solid side and the other on the effluent side. For septic tanks which are 2,000 gallons or larger, the solid side shall be equipped with at least two risers. All risers shall extend to within 4 inches of final grade, be sealed off with an approved lid, and be accessible from the ground surface. Tanks shall also be equipped with effluent filters. Risers and effluent filters must meet the regulatory requirements as defined in
Riverside County Ordinance 650, and shall be designed and installed in accordance with current industry standards.

The liquid capacity of the septic tank shall conform to UPC Tables K-2 or K-3 based on the number of bedrooms or apartment units and the estimated waste/sewage design flow rate or the number of plumbing fixture units as determined from UPC Table 7-3, whichever is greater.

The capacity of a septic tank and its drainage system shall be limited by the soil structure classification as specified in Table 5.1 (UPC Appendix K, Table K-5).

Typically for residences, the Department will not require a septic tank volume greater than 2500 gallons, unless the Professional of Record specifies a larger system is needed.

Note: Septic tank sized using the estimated waste/sewage flow rates should be calculated as follows:

1) Waste/sewage flow up to 1,500 gallons/day (5,677.5 L/day)
   Septic tank size = Waste/sewage flow x 1.5

2) Waste/sewage flows over 1,500 gallons/day (5,677.5 L/day)
   Septic tank size = Waste flow x 0.75 + 1,125

Absorption System General Design:

The required square feet of leaching area for either a seepage or leach system shall be based on the calculated septic tank capacity. For every gallon of septic tank capacity required, there is an equivalent square foot of leaching area required based on the soil rate. As aforementioned, the Department will not require a septic tank volume greater than 2500 gallons for residences, unless the Professional of Record designs for a larger system. For commercial systems, the maximum septic tank size and its absorption system is limited by the following table:

<table>
<thead>
<tr>
<th>Leach Lines: Sq. Ft./ 100 gallons</th>
<th>Seepage Pits: Q=Gallons/Square Foot/Day</th>
<th>Maximum Septic Tank Size Allowable (Gallons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>4</td>
<td>7500</td>
</tr>
<tr>
<td>40</td>
<td>3.2</td>
<td>5000</td>
</tr>
<tr>
<td>90</td>
<td>2.5</td>
<td>3500</td>
</tr>
<tr>
<td>120</td>
<td>1.11</td>
<td>3000</td>
</tr>
</tbody>
</table>
Leaching Beds:

Where leaching beds are proposed, the area of the bed shall be at least 50% greater than the requirements for trenches. Distribution drain lines in leaching beds shall not be more than 6 feet apart on centers, and no part of the perimeter of the leaching bed shall be more than 3 feet from a distribution drain line. When “Chamber” type units are proposed, the Department will allow a 20% reduction when calculating the required leach bed bottom area.

Leach or Drain Line Design:

The leach line disposal field shall be constructed as follows:

Table 5.2

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Minimum number of drain lines per field.</td>
<td>1</td>
</tr>
<tr>
<td>2. Maximum length of each line.</td>
<td>100 feet</td>
</tr>
<tr>
<td>3. Minimum/Maximum bottom width of trench.</td>
<td>36 inches</td>
</tr>
<tr>
<td>4. Minimum spacing of 36” width lines center to center.</td>
<td>7 feet</td>
</tr>
<tr>
<td>5. Minimum depth of earth cover over lines.</td>
<td>12 inches</td>
</tr>
<tr>
<td>6. Preferred depth of cover of lines.</td>
<td>18 inches</td>
</tr>
<tr>
<td>7. Minimum filter material over drain lines.</td>
<td>2 inches</td>
</tr>
<tr>
<td>8. Perforated pipe or “chamber” shall be laid level and with the end of the line capped.</td>
<td></td>
</tr>
<tr>
<td>9. Each leach line trench must be separated by sufficient natural and undisturbed soil.</td>
<td></td>
</tr>
</tbody>
</table>

Leach Line Installation on or Near Slopes:

Any portion of the disposal field shall maintain a 15 foot horizontal distance from daylight (or side of slope) to any portion of the leach line or leach bed. Table 5.3 gives the minimum cover allowed and depth of testing versus the percent of slope in the area of the disposal field to meet the 15 foot requirement. This Table also gives a factor by which to increase the square foot of bottom area due to the loss in transpiration caused by the added cover overburden.

Note: No system shall be installed in slopes greater than 45%. Regional Water Quality Control Board (RWQCB) approval may be required to address steep slopes. Contact the Department for specific requirements.

Note: The minimum depth of test required due to (%) percent slope of natural ground does not take into account leach line designs utilizing 2 feet or 3 feet of rock underneath leach line pipe. The Professional of Record must increase the required test depth to accommodate for the use of 2 feet or 3 feet of rock.
<table>
<thead>
<tr>
<th>(%) Slope of natural ground in area of disposal system</th>
<th>Minimum cover over lines / bed (ft.)</th>
<th>Minimum depth of test required (ft.)</th>
<th>Overburden Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>1</td>
<td>3</td>
<td>1.0</td>
</tr>
<tr>
<td>10%</td>
<td>1.5</td>
<td>3</td>
<td>1.0</td>
</tr>
<tr>
<td>15%</td>
<td>2.25</td>
<td>4</td>
<td>1.0</td>
</tr>
<tr>
<td>20%</td>
<td>3</td>
<td>4</td>
<td>1.0</td>
</tr>
<tr>
<td>25%</td>
<td>3.75</td>
<td>5</td>
<td>1.1</td>
</tr>
<tr>
<td>30%</td>
<td>4.5</td>
<td>6</td>
<td>1.2</td>
</tr>
<tr>
<td>35%</td>
<td>5.25</td>
<td>7</td>
<td>1.3</td>
</tr>
<tr>
<td>40%</td>
<td>6</td>
<td>8</td>
<td>1.4</td>
</tr>
<tr>
<td>45%</td>
<td>7.0</td>
<td>9</td>
<td>1.5</td>
</tr>
</tbody>
</table>

**Serial Distribution (Step Dam System):**

On steep slopes, leach lines or leach beds shall be stepped to prevent excessive line slope. The lines between each horizontal section shall be made with watertight joints and shall be designed so each horizontal leaching trench or bed shall be utilized to the maximum capacity before the effluent passes to the next lower leach line or bed. The lines between each horizontal leaching section may be installed on natural or unfilled ground. Step Dam Systems are generally required on slopes greater than. See Figure 5.1
Figure 5.1

Step Dam With Plastic Chambers (Configuration#1)
Minimum Slope – 20% ≤ X ≤ 35%

Figure 5.2

Step Dam With Plastic Chambers (Configuration#2)
Minimum Slope – 20% ≤ X ≤ 35%
Slope Leach Line Installation – With the Slope:

On moderate slopes where the system is installed with the slope, dams (natural or man-made) must be provided at each step down as shown in Figure 5.4.
**Driveways:**

Leach lines **shall not** be installed under driveways, paved or unpaved. Seepage pits may be installed beneath driveways provided they are fitted with traffic rated lids.

**Seepage Pit Design:**

Seepage pits shall be constructed as follows:

1) Each seepage pit shall be circular in shape and shall have an excavated diameter of not less than five feet.
2) Each pit shall be lined with whole new hard burned clay brick, concrete brick, concrete circular type cesspool blocks or other approved materials.
3) Each seepage pit shall have a minimum sidewall of 10 feet below the inlet with a maximum total depth of 40 feet (not including the arched cap), unless approved by the Department.
4) The top of the cover must be at least 18 inches but no more than 4 feet below the surface of the ground.
5) The horizontal distance from a seepage pit to the top of a cut bank shall be equal to 5 times the vertical height of the bank or 25 feet, whichever is less.
6) A minimum 6 inch annulus filled with clean ¾ inch gravel shall be provided between the pit structure and the excavation wall. Slag is acceptable if it is clean and uniformly sized at ¾ inch.

The OWTS must be setback from certain structures and features to help ensure public safety and proper functioning of the system. Table 5.4 delineates setbacks from septic tanks, disposal fields and seepage pits. Watercourses require special consideration and are described after Table 5.4
Table 5.4
Minimum Horizontal Separations for Subsurface Sewage Disposal

<table>
<thead>
<tr>
<th>Minimum Horizontal Distance From:</th>
<th>Septic Tank</th>
<th>Disposal Field</th>
<th>Seepage Pit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building or Structure&lt;sup&gt;1&lt;/sup&gt;</td>
<td>5 feet</td>
<td>8 feet</td>
<td>8 feet</td>
</tr>
<tr>
<td>Property Line Adjoining Private Property&lt;sup&gt;2&lt;/sup&gt;</td>
<td>5 feet</td>
<td>5 feet</td>
<td>8 feet</td>
</tr>
<tr>
<td>Water Supply Wells&lt;sup&gt;3,4&lt;/sup&gt;</td>
<td>100 feet</td>
<td>100 feet</td>
<td>150 feet</td>
</tr>
<tr>
<td>Trees (greater than 10 inches in diameter)</td>
<td>10 feet</td>
<td>---</td>
<td>10 feet</td>
</tr>
<tr>
<td>Seepage Pits</td>
<td>5 feet</td>
<td>5 feet</td>
<td>12 feet</td>
</tr>
<tr>
<td>Disposal Field</td>
<td>5 feet</td>
<td>4 feet</td>
<td>5 feet</td>
</tr>
<tr>
<td>On Site Domestic Water Service Line&lt;sup&gt;5&lt;/sup&gt;</td>
<td>5 feet</td>
<td>5 feet</td>
<td>5 feet</td>
</tr>
<tr>
<td>Distribution Box</td>
<td>---</td>
<td>5 feet</td>
<td>5 feet</td>
</tr>
<tr>
<td>Pressure Public Water Main Line</td>
<td>10 feet</td>
<td>10 feet</td>
<td>10 feet</td>
</tr>
<tr>
<td>Flood Plain / 100 Year Flood Zone</td>
<td>Refer to Current UPC</td>
<td>Refer to Current UPC</td>
<td>Refer to Current UPC</td>
</tr>
</tbody>
</table>

1. Building or Structure includes porches and steps, whether covered or uncovered, breezeways, roofed porte-cochères, roofed patios, carports, covered walks, covered driveways and similar structures or appurtenances.

2. System may go up to the edge of the property line adjoining public property if no public water mains are within or anticipated within 25 feet of the property line. A statement from the water district is required.

3. These water supply well minimum setbacks listed in Ordinance 682 must be maintained. However, per Ordinance 682, any surface sewage disposal system discharging 2,000 gal/day or more will require a 200 feet minimum setback.

4. All drainage piping shall clear domestic water supply wells by at least 50 feet. This distance may be reduced to not less than 25 feet when the drainage piping is constructed of materials approved for use within a building.

5. Water pipes crossing sewer piping shall be laid a minimum of 12 inches above that sewer pipe.
Watercourses:

Watercourses, for purposes of determining setbacks from OWTS, have been separated into three main categories which are defined as follows:

1) **Major Streams.** This category includes watercourses such as the Santa Ana River, Strawberry Creek, San Jacinto River, Murrieta Creek, etc. Major streams have surface flows year round during most years.

   Table 5.5
   Setbacks from Major Streams

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Septic tank</td>
<td>50</td>
</tr>
<tr>
<td>Leach line</td>
<td>100</td>
</tr>
<tr>
<td>Leach bed</td>
<td>100</td>
</tr>
<tr>
<td>Seepage Pit</td>
<td>150</td>
</tr>
</tbody>
</table>

2) **Ephemeral Streams.** These watercourses lose their surface flows at times during most years, but may still have significant cfs underflows. Significant underflow is usually evidenced by lush vegetative growth at the streambed during the dryer months of the year.

   Table 5.6
   Setbacks from Ephemeral Streams

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Septic tank</td>
<td>25</td>
</tr>
<tr>
<td>Leach line</td>
<td>50</td>
</tr>
<tr>
<td>Leach bed</td>
<td>50</td>
</tr>
<tr>
<td>Seepage Pit</td>
<td>100</td>
</tr>
</tbody>
</table>

3) **Drainage Courses.** These water courses include: ephemeral streams with little or no underflow during dry periods, eroded channels, unlined drainage channels, swales, gullies, ravines, dry creek beds, etc.

   Table 5.7
   Setbacks from Drainage Courses

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Septic tank</td>
<td>15</td>
</tr>
<tr>
<td>Leach line</td>
<td>15</td>
</tr>
<tr>
<td>Leach bed</td>
<td>15</td>
</tr>
<tr>
<td>Seepage Pit</td>
<td>15</td>
</tr>
</tbody>
</table>
All setback measurements for watercourses are to be taken from outer edge of the “high water mark of the watercourses.

Notes: Not every watercourse will fit neatly into one of these categories. When there is some doubt as to how to properly categorize a watercourse, the setback requirement should be determined based on a joint field investigation by the Department and the Professional of Record.

**Sidewall Calculations for Leach Line and Leach Bed Design:**

This Department will allow the use of side wall calculations for leach line design with the following stipulations:

1) Percolation tests must be performed at the proposed bottom of the trench.

2) Boring depth must be extended proportionately to allow for increased leach line depth.

3) The rate applied will be 2 square foot of bottom area for each additional foot of rock in excess of the required 1 foot of rock below the bottom of the drain line. Total depth of rock not to exceed 3 feet.

4) The horizontal separation distance between any two adjacent leach lines must be increased by 1 foot (greater than the existing 7 foot center to center requirement) for each additional foot of rock below the minimum 1 foot.

5) No system shall have a total trench bottom area less than 150 sq. ft.

Table 5.8 lists the allowance for sidewall calculations:

<table>
<thead>
<tr>
<th>Depth of Rock Below Leach Line</th>
<th>Square Foot of Bottom Area per Linear Foot of 3 Foot Wide Trench</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 foot of rock</td>
<td>3 Sq. Feet</td>
</tr>
<tr>
<td>2 foot of rock</td>
<td>5 Sq. Feet</td>
</tr>
<tr>
<td>3 foot of rock</td>
<td>7 Sq. Feet</td>
</tr>
</tbody>
</table>
Alternative Systems:

Many lots that are desirable for development are unsuited for conventional septic systems as defined in Riverside County Ordinance 650 (“Ordinance 650”) due to soil conditions and/or groundwater issues. A number of technologies have been developed to address these issues.

The proposed alternative system must meet the following criteria in order to be considered:

- The alternative system must meet the performance conditions established by the RWQCB and the Department. The alternative system must be accepted by, and in active use in another California jurisdiction.
- The alternative system must be certified by NSF International as a Class-1 Treatment Unit (to the ANSI/NSF Standard-40).

The proposed alternative system will be based on an OWTS report performed in accordance with this Technical Guidance Manual and designed by the Professional of Record.

All alternative systems are subject to an annual operating permit issued by the Department, subject to inspections, fees and conditions as authorized by Riverside County Board of Supervisors.

The existence of any Alternative System and the requirement for maintaining a renewable operating permit shall be recorded on the deed for said parcel.

Graywater Systems:

Graywater is defined in the UPC, as untreated household waste water that has not come into contact with toilet waste. Additionally, graywater shall not include wastewater from kitchen sinks or dishwashers. Graywater systems handling the disposal of graywater must comply with the provisions set forth by UPC. No plumbing connection deemed by the Department having the potential of carrying toilet waste will be allowed to connect to a graywater system. All graywater systems shall only be designed for underground effluent dispersal only. No surface discharge of graywater is permitted. Graywater systems shall be designed for residential use only. The capacity of the private OWTS shall not be reduced or otherwise affected by the existence or proposed installation of a graywater system servicing the premises.

Holding Tanks:

A Holding Tank is defined in Ordinance 650 as a sewage facility, of a temporary nature, that has no means of discharge. It requires periodic maintenance and shall have a renewable operating permit issued by the Department.
If approval to utilize an OWTS has been denied, a holding tank may be approved provided that the sewering agency which serves the area agrees in writing to the installation of a holding tank and the following conditions are met:

1) A holding tank may be approved for a period not to exceed two years from the date of approval. A “will-serve” letter from the sewering agency for the area shall be submitted which indicates the site will be provided sewer service within the two year period. An extension of the two year connection requirement for cause. The ultimate approval of the extension rests solely on the Department.

2) The sewering agency for the area assumes responsibility for the operation and maintenance of the holding tank.

3) No wholesale or retail food facilities shall use a holding tank.

4) When a sewer line becomes available, abandonment of the holding tank in a manner approved by the Department is required. Abandonment and connection to the sanitary sewer shall occur within sixty (60) calendar days of sewer availability.

5) A holding tank may be approved as a replacement system for an existing residence when an OWTS is not feasible if approved in writing by the Department.

No holding tank facility shall be placed in any portion of a public right-of-way without written approval from the responsible public agency.
A Sanitation Form 53 or “SAN53” is a form required by County Ordinance No. 460 (Regulating Land Developments). The form is completed by the Department prior to a developer filing the map and application with the Planning Department.

**What is required in order for the developer to receive a SAN 53 form from the Department?**

If the project is proposing potable water service and sanitary sewer service from a utility company, the developer must submit the following items to the Department for review:

1) A copy of the tentative map.

2) A current water availability letter or current “will-serve” letter from the appropriate water utility company. This letter must clearly state that the water company will be willing and able to serve potable water after the necessary financial matters have been met.

3) A current sewer availability letter or current “will-serve” letter from the appropriate sewer utility company. This letter must clearly state that the district or agency has sewer capacity in its treatment facilities and is willing to provide sewers to the proposed development after all financial matters have been met.

If the project is proposing potable water service and sanitary sewer service is not available in which the project will propose onsite wastewater treatment systems, the developer must submit the following items to the Department for review:

1) A copy of the tentative map.

2) A current water availability letter or current “will-serve” letter from the appropriate water utility company. This letter must clearly state that the water company will be willing and able to serve water meeting the proper health standards after the necessary financial matters have been met.

3) An OWTS report performed in accordance with the standards set forth by this Technical Guidance Manual.

4) An approval from the RWQCB in which the development lies may be required. There are three regions of the Water Board in Riverside County:

- Santa Ana Regional Water Quality Board
  3737 Main Street, Suite 600
  Riverside, CA 92501-3348
  (951) 782-4130

---

**CHAPTER 7 SANITATION FORM 53 FOR PARCEL & TRACT SUBDIVISIONS**
• San Diego Regional Water Quality Board
  9174 Sky Park Court, Suite 100
  San Diego, CA 92123-4340
  (858) 467-2952

• Colorado River Basin Regional Water Quality Board
  73-720 Fred Waring Drive, Suite 100
  Palm Desert, CA 92260
  (760) 346-7491
Note: Pending Ordinance revision.

I. PROFESSIONAL OF RECORD

Only those individuals trained and educated to perform, understand and evaluate the field conditions and tests, as they relate to OWTS may perform percolation tests. This would include those with experience in OWTS design and hold one of the following State of California credentials and registrations: PE, PG and REHS. No person shall perform percolation tests or submit a percolation report as described in Chapter 3 within the unincorporated areas of Riverside County and its contracted cities unless registered with the Department as a Professional of Record. A list of approved Professional of Records shall be maintained by the Department.

Initial Registration
Any individual desiring registration as a Professional of Record shall meet the following requirements:

1. Submit a complete Professional of Record Registration Application.
2. Provide proof of State of California issued license or registration as a Professional Engineer, Certified Engineering Geologist, or Registered Environmental Health Specialist.
3. Pay registration fee along with completed application.

Registration is non-refundable, not transferable, and shall expire on December 31st of each year. Registration may be renewed by payment of renewal fee. Any change or lapse in registration shall require the completion of a new PR registration application.

NOTE: An alternative system’s manufacturer may have additional requirements for the Professional of Record.

II. QUALIFIED SERVICE PROVIDER (QSP)

No person shall certify or inspect an OWTS in the unincorporated areas of Riverside County and its contracted cities unless registered with the Department as a Qualified Service Provider (QSP).

Initial Registration
Any individual desiring registration as a QSP shall meet the following requirements:

1. Submit a complete QSP Registration Application.
2. Provide proof of current C-42, C-36 and/or Class A General Contractor’s License issued by the State of California or provide proof of licensing or registration as a Professional Engineer, Certified Engineering Geologist, or Registered Environmental Health Specialist.
3. Provide proof of completion of “OWTS Inspector Certification” training through the National Sanitation Foundation, National Association of Wastewater Transporters, or other similarly recognized professional organization approved by the Department.
4. Pay registration fee along with completed application.

Registration is non-refundable, not transferable, and shall expire on December 31\textsuperscript{st} of each year. Registration may be renewed by payment of renewal fee. Any change or lapse in registration shall require the completion of a new QSP registration application.

\textit{NOTE: A system’s manufacturer may have additional requirements that shall be met in order to function as a QSP for that specific company’s products and treatment systems.}

III. DEPARTMENT OVERSIGHT

The Department will conduct random audits of services performed by a Professional of Record or a Qualified Service Provider. At the discretion of the Department, additional verification may be required including but not limited to, additional soil testing, excavations, and/or inspections of OWTS. QSP registration may be revoked for cause. Upon revocation, a new application and applicable fees will be required. Proof of current “OWTS Inspector Certification” training may also be required.

Registered individuals who violate any provision of this technical manual will be investigated by the Department and appropriate enforcement actions will be taken.
Note: Pending Ordinance revision.

OWTS Certification

Individuals receiving QSP certification from the County of Riverside shall have the authority to conduct OWTS certifications. OWTS certifications shall include the following:

a) Identify all septic system components, location, and specification
b) Determine the current condition and functionality of an existing OWTS
c) Make modifications of an existing OWTS within the manufacturer’s recommendations or guidelines
d) Make repair recommendations and perform needed repairs on an existing OWTS
e) Identify an existing structure’s total bedroom count and fixture count to ensure proper septic tank sizing

The QSP shall document their findings of an OWTS certification using Department form entitled “Certification of Existing Subsurface Disposal System”. The certification shall also include an appropriately scaled plot plan signed by the QSP. The plot plan shall include the following: design and location of the OWTS and its 100 percent expansion area in relation to its attached dwelling or structure; other detached structures and second units; water meters, wells, rocks, water courses, dry wells, property corners, driveways, and various surface features such as drainage courses.

When is an OWTS Certification required?

An OWTS Certification shall be required for the following:

a) For any major repair and/or modifications performed on an existing OWTS
b) To ensure there is no encroachment between an existing OWTS, including expansion area, and a proposed construction project
c) For any project proposing to utilize an existing OWTS
d) As required by the Department
# Perc Data Sheet – Field Copy (Seepage Pits)

<table>
<thead>
<tr>
<th>Project:</th>
<th>Job No.</th>
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<tbody>
<tr>
<td>Test Hole No.</td>
<td>Tested by:</td>
</tr>
<tr>
<td>Depth of Hole as Drilled:</td>
<td>Before Test:</td>
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</tbody>
</table>

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<thead>
<tr>
<th>Reading No.</th>
<th>Time</th>
<th>Time Interval (Min)</th>
<th>Total Depth of Hole (Ft)</th>
<th>Initial Water Level (Ft)</th>
<th>Final Water Level (Ft)</th>
<th>▲ In Water Level (Ft)</th>
<th>Comments</th>
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</table>
Final Test Data Sheet – Seepage Pits

\[ Q = \frac{F}{T} \times (D \times 9) \quad \text{or} \quad Q = R \times \frac{D}{L} \times 9, \quad \text{Where} \quad R = \frac{F}{T} \quad \text{in ft./hr.} \]

\[ Q = \text{Rate in gallons/sq. ft. of sidewall per day of septic tank effluent.} \]

\[ F = \text{Drop during time interval in feet.} \]

\[ T = \text{Time interval in hours.} \]

\[ D = \text{Diameter of hole in feet.} \]

\[ L \text{ (Avg.)} = \text{Average wetted depth during time interval in feet. Minimum depth is 10 feet.} \]

<table>
<thead>
<tr>
<th>Project:</th>
<th>Date:</th>
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<tbody>
<tr>
<td>By:</td>
<td>Remarks:</td>
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<tr>
<td>Boring No.</td>
<td>Dia.</td>
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</table>

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<tr>
<th>Time Read (Min)</th>
<th>Time Interval (Min)</th>
<th>Fall (Ft)</th>
<th>Time Int. (Hr.)</th>
<th>Rate (Ft/Hr.)</th>
<th>Wall Length(^1) / Wall Length(^2)</th>
<th>Avg. Wall Length (Ft.)</th>
<th>Q (gal / s.f./day)</th>
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</tbody>
</table>

\(^1\) Initial Water Column Height

\(^2\) Final Water Column Height
**APPENDIX 3 – EXAMPLE OF SEEPAGE PIT DATA ENTRY**

Typical Example of Seepage Pit Data Entry

**Falling Head Perc Data Sheet – Field Copy**

<table>
<thead>
<tr>
<th>Reading No.</th>
<th>Time</th>
<th>Time Interval (Min)</th>
<th>Total Depth of Hole (Ft)</th>
<th>Initial Water Level (Ft)</th>
<th>Final Water Level (Ft)</th>
<th>▲In Water Level (Ft)</th>
<th>Comments</th>
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<tbody>
<tr>
<td>1</td>
<td></td>
<td>10:25</td>
<td>35</td>
<td>3.0</td>
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</tr>
<tr>
<td>2</td>
<td></td>
<td>10:55</td>
<td>30</td>
<td>34</td>
<td>8.0</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>11:00</td>
<td>34</td>
<td>3.0</td>
<td></td>
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<tr>
<td>4</td>
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<td>11:30</td>
<td>30</td>
<td>33</td>
<td>7.4</td>
<td>4.4</td>
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**Final Test Data – Seepage Pits**

<table>
<thead>
<tr>
<th>Time Read (Min)</th>
<th>Time Interval (Min)</th>
<th>Fall (Ft)</th>
<th>Time Int. (Hr.)</th>
<th>Rate (Ft/Hr.)</th>
<th>Wall Length$^1$/ Wall Length$^2$</th>
<th>Avg. Wall Length (Ft.)</th>
<th>Q (gal / s.f./day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:25</td>
<td>30</td>
<td>5.0</td>
<td>0.5</td>
<td>10</td>
<td>$\frac{35-2=32}{34-8=26}$</td>
<td>29</td>
<td>1.55</td>
</tr>
<tr>
<td>10:55</td>
<td>30</td>
<td>5.0</td>
<td>0.5</td>
<td>10</td>
<td>$\frac{35-2=32}{34-8=26}$</td>
<td>29</td>
<td>1.55</td>
</tr>
<tr>
<td>11:00</td>
<td>30</td>
<td>4.4</td>
<td>0.5</td>
<td>8.8</td>
<td>$\frac{34-3=31}{33-7.4=25.6}$</td>
<td>28.3</td>
<td>1.40</td>
</tr>
<tr>
<td>11:30</td>
<td>30</td>
<td>4.4</td>
<td>0.5</td>
<td>8.8</td>
<td>$\frac{34-3=31}{33-7.4=25.6}$</td>
<td>28.3</td>
<td>1.40</td>
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</table>
Leach Line Percolation Data Sheet

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<th>Project</th>
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</thead>
<tbody>
<tr>
<td>Test Hole No.</td>
<td>Date Excavated:</td>
</tr>
<tr>
<td>Depth of Test Hole:</td>
<td>Soil Classification</td>
</tr>
<tr>
<td>Check for Sandy Soil Criteria Tested by:</td>
<td>Date:</td>
</tr>
<tr>
<td>Actual Percolation Tested by:</td>
<td>Date:</td>
</tr>
</tbody>
</table>

### Sandy Soil Criteria Test

<table>
<thead>
<tr>
<th>Trial No.</th>
<th>Time</th>
<th>Time Interval (Min)</th>
<th>Initial Water Level (Inches)</th>
<th>Final Water Level (Inches)</th>
<th>▲in Water Level (Inches)</th>
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<td>1</td>
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Use: Normal Sandy (Circle One) Soil Criteria

<table>
<thead>
<tr>
<th>Time</th>
<th>Time Interval (Min)</th>
<th>Total Elapsed Time (Min)</th>
<th>Initial Water Level (Inches)</th>
<th>Final Water Level (Inches)</th>
<th>▲in Water Level (Inches)</th>
<th>Percolation Rate (Min/Inch)</th>
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</table>
## Field Log No.

<table>
<thead>
<tr>
<th>Job No.</th>
<th>Date:</th>
<th>Elevation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Name:</td>
<td>Reference</td>
<td>Location:</td>
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<td>Logged by:</td>
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</tr>
<tr>
<td>Assistant:</td>
<td>Water Level:</td>
<td></td>
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<tr>
<td>Drilling Company:</td>
<td>Time:</td>
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<tr>
<td>Setup:</td>
<td>Start:</td>
<td>Stop:</td>
</tr>
<tr>
<td>Drilling Method:</td>
<td>Driving Weight:</td>
<td>Drop Height:</td>
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<table>
<thead>
<tr>
<th>Depth (Feet)</th>
<th>Samples</th>
<th>Blow Count</th>
<th>USCS Symbol</th>
<th>Material Description (consistency, moisture, color)</th>
<th>Remarks</th>
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Appendix 6 – TYPICAL LEACH LINE AND SEEPAGE PIT

SEEPAGE PIT DESIGN

10' MIN. TO GROUNDWATER
8' MIN. TO BEDROCK OR AN IMPERVIOUS STRATA
APPENDIX 7 – SAMPLE PLOT PLANS

Owner:
D. R. Bodily
54321 Rand Street
Riverside, CA  787-6543

Job Address:
28865 North Street
Elsinore
592-041-000
Lot 1 FM 7811

4 Bedroom House
1200 gal septic tank
50 sq. ’/100 gal Rate
(see Item 12)
600 sq’ Bottom Area
200 Liner Ft. of 3’ Trench
3 Lines 61’ Long X 3’ Wide
+ 100% Expansion

Special Notes:
No swimming pools or other
large appurtenances to be
built without Health Dept.
approval.

See note section for
details.

Drawn By

Firm/Owner

Date

No Scale
Now that you know about the proper planning and design of On-site Waste Water Disposal Systems, let’s talk about how you can help reduce or eliminate most human health or environmental threats posed by pollutants in household wastewater.

**WHAT YOU CAN DO**

- Properly and regularly maintaining your septic system will ensure that it will work efficiently providing you years of service. The safe treatment of sewage helps to prevent the spread of infection and disease and protect water resources. Typical pollutants in household wastewater are nitrogen, phosphorus, and disease-causing bacteria and viruses.

- When these systems fail to operate properly, significant damage can occur to property and the environment. As a homeowner, **you are responsible** for maintaining your septic tank system with periodic system pumping and inspections.

- Do not pump out full or overflowing septic tank systems to the street or where it may eventually enter the storm drain system.

- About ¼ of U.S. homes use septic systems and more than 4 billion gallon of wastewater per day is dispensed below the ground’s surface. The average indoor water use in the typical single family home is almost 70 gallons per person daily. *Take shorter showers and repair leaky pipes and faucets, since limiting water use can improve the operation of the septic system and reduce the risk of system failure.*

- Household toxics, such as oil-based paints, solvents, and large volumes of toxic cleaners should not enter your septic system. Even latex paint cleanup waste should be minimized. *Squeeze all excess paint and stain from brushes and rollers on several layers of newspaper before rinsing. Instead of disposing chemicals down the drain, share left over household cleaners*
with neighbors or friends. Take your chemical discards to your local household hazardous waste collection center.

- There are all types of household cleaner strengths and some are less toxic to your septic system than others. Use products only in the amounts shown on the label instructions and minimize the amount discharged into your septic system.

- Do your part to protect our surface waters and ground waters.

Helpful Resources

For Emergencies, dial 911
To report a sewage spill during normal business hours (8 am – 5 pm) at 951 358-5453 or AFTER hours, call 1-800-506-2555.

- www.rcflood.org Riverside Co. Flood Control and Water Conservation District “Only Rain Down the Storm Drain”

- www.rivcoeh.org Riverside Co. Environmental Health

- www.septicyellowpages.com Lists by state septic professional pumpers, installers, inspectors and tank manufacturers.

- www.nesc.wvu.edu The National Environmental Services Center helps small communities and individuals solve their wastewater problems.