SHASTA COUNTY
LOCAL AGENCY MANAGEMENT PROGRAM FOR
ONSITE WASTEWATER TREATMENT SYSTEMS (OWTS)

TECHNICAL GUIDANCE MANUAL (draft being prepared; not finalized to date 4.18.16)

APPENDICES

SHASTA COUNTY
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SECTION 1 INTRODUCTION

1. A. BACKGROUND

The California Water Code authorizes the State Water Resources Control Board (SWRCB) to regulate all discharges, including those from Onsite Wastewater Treatment Systems, which could adversely impact water quality. The policies of the SWRCB are implemented locally through nine Regional Water Quality Control Boards. Historically, each regional board developed basin plans that outlined water quality objectives in their respective jurisdictions as well as policies and programs to achieve those objectives.

Discharges are regulated through the use of Waste Discharge Requirements (WDRs). Shasta County is in Region Five which is the Central Valley Regional Water Quality Control Board (CVRWQCB). The SWRCB regulatory authority extends to individual **Onsite Wastewater Treatment Systems (OWTS)**. General guidelines for the Siting, Design, and Construction of OWTS were part of each regional board's basin plans. The SWRCB and the regional boards recognize the advantages and efficiencies of OWTS regulation by local agencies. Consequently, while the regional boards retained primacy over large and specialized systems, direct regulatory authority for individual OWTS has been delegated to individual counties.

The State OWTS Policy and **Local Agency Management Program (LAMP)** are the culmination of the actions required by Assembly Bill 885 (AB 885). AB 885 was introduced to the California State assembly on February 25, 1999, and would have impacted only coastal counties. The final version approved on September 27, 2000, was more inclusive, affecting all California counties. This legislation directed the SWRCB to develop regulations or standards for OWTS to be implemented statewide by qualified local agencies that issue sewage disposal system permits, which in Shasta County is the Environmental Health Division (SCEHD). The SWRCB adopted the Water Quality Control Policy (State OWTS Policy) for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems on June 19, 2012. The Policy was subsequently approved by the Office of Administrative Law on November, 13, 2012, and became effective on May 13, 2013. The OWTS Policy allows local agencies to approve OWTS, based on a local ordinance, after submittal and approval of a LAMP by the applicable CVRWQCB.

Under an approved LAMP, the requirement to obtain WDRs for an OWTS is conditionally waived for OWTS that are in conformance with the Policy. Failure of counties to submit and obtain approval of a LAMP would mean that septic system permits for only those few sites meeting the more restrictive Tier 1 soil requirements could be issued by local agencies. All other existing sites would potentially be subject to the WDR process.

1. B. POLICY TIERS

The Adopted State Policy places OWTS in California into one of the following Tiers:

TIER 0 – Existing OWTS. These are defined as existing OWTS that are properly functioning, and do not meet the conditions of failing. These do not require corrective action as specifically described in Tier 4, and are not contributing to an impairment of surface water as specifically described in Tier 3.

TIER 1 - Low-risk new or replacement OWTS. These are new or replacement OWTS that meet low risk siting and design requirements as specified in Tier 1. Minimum soil depths to groundwater and minimum soil depth from the bottom of a dispersal system range from 5 to 20 feet, based on soil percolation rates.

TIER 2 - Local Agency Management Program for new and replacement OWTS. California is known for its extreme range of geological and climatic conditions. As such, the establishment of a single set of criteria for OWTS would either be too restrictive so as to protect the most sensitive case, or would have broad allowances that would not be protective enough under some circumstances. To accommodate this extreme variance, local agencies may submit management programs known as Local Agency Management Programs (LAMP) for approval by the CVRWQCB, then upon approval, manage the installation of new and replacement OWTS under that Program. An approved LAMP allows local agencies to develop customized management programs that address the soil and groundwater depths specific to that jurisdiction. The LAMP must be approved by the appropriate CVRWQCB. Under an approved LAMP, separation of the bottom of a dispersal system to groundwater of as little as two feet may be allowed with an approved alternate OWTS. Once approved, the standards contained in an approved LAMP supersede the Tier 1 standards. However, systems meeting Tier 1 soil and siting criteria would be considered a conventional OWTS within Shasta County.

TIER 3 - Impaired Areas. Systems that are within 600 feet of impaired water bodies. There are no such water bodies identified within Shasta County.

TIER 4 - OWTS Requiring Corrective Action. OWTS that require corrective action or fail at any time while this Policy is in effect are automatically in Tier 4 and must follow Tier 2 requirements pending completion of corrective action.

It is Shasta County's intent to regulate projected wastewater flows up to 10,000 gallons per day under TIER 2 for dispersal underground only. In addition to projects that may have waste strength great than normally found in domestic flows evaluated by SCEHD staff, any project with a projected flow nearing 10,000 gallons per day will be discussed with the CVRWQCB staff. (OWTS Policy 9.2) (OWTS Policy 9.4.2) (OWTS Policy 9.4.3)

Additionally, through the use of a variety of supplemental treatment systems and/or alternate dispersal systems, which are described in the Technical Guidance Manual, this LAMP includes a

number of differing system designs and monitoring requirements to meet the full intent of the State OWTS Policy. SCEHD is committed to protecting public health and water quality while allowing continued development in Shasta County.

1. C. PROHIBITIONS (OWTS Policy 9.4)
Pursuant to the State OWTS Policy, the following will not be authorized in a LAMP:

- Cesspools of any kind or size. (OWTS Policy 9.4.1)
- OWTS receiving a projected flow over 10,000 gallons per day. (OWTS Policy 9.4.2)
- OWTS that utilize any form of effluent dispersal that discharges on or above the post installation ground surface such as sprinklers, exposed drip lines, free-surface wetlands, a pond, or any other similar surface discharge. (OWTS Policy 9.4.3)
- Slopes greater than 30 percent without a slope stability report approved by a registered professional. (OWTS Policy 9.4.4)
- Decreased leaching area for IAPMO certified dispersal systems using a multiplier less than 0.70. (OWTS Policy 9.4.5)
- OWTS utilizing supplemental treatment without requirements for periodic monitoring or inspections. (OWTS Policy 9.4.6.)
- OWTS dedicated to receiving significant amounts of wastes dumped from RV holding tanks. (OWTS Policy 9.4.7)
- Separation of the bottom of dispersal system to groundwater less than two feet. (see Technical Guidance Manual) (OWTS Policy 9.4.8)
- Installation of new or replacement OWTS where public sewer is available. The public sewer may be considered unavailable when such public sewer or any building or exterior drainage facility connected thereto is located more than 200 feet from any proposed building or exterior drainage facility on any lot or premises that abuts and is served by such public sewer. This provision does not apply to replacement OWTS where the connection fees and construction costs are greater than twice the total cost of the replacement OWTS and the local agency 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. (OWTS Policy 9.4.9)

Horizontal Setback Requirements Except as provided in the noted exceptions below. SCEHD may not approve new or replacement OWTS with the minimum horizontal setbacks less than any of the following: (OWTS Policy 9.4.10)

- 150 feet from a public water well where the depth of the effluent dispersal system does not exceed 10 feet in depth. (OWTS Policy 9.4.10.1)

- 200 feet from a public water well where the depth of the effluent dispersal system exceeds 10 feet in depth. (OWTS Policy 9.4.10.2)

- Where the effluent dispersal system is within 600 feet of a public water well and exceeds 20 feet in depth, the horizontal setback required to achieve a two-year travel time for microbiological contaminants shall be evaluated. A qualified professional shall conduct this evaluation. However, in no case shall the setback be less than 200 feet. (OWTS Policy 9.4.10.3)

- Where the effluent dispersal system is within 1,200 feet from a public water system's surface water intake point, within the catchment of the drainage, and located such that it may impact water quality at the intake point such as upstream of the intake point for flowing water bodies, the dispersal system shall be no less than 400 feet from the high water mark of the reservoir, lake, or flowing water body. (OWTS Policy 9.4.10.4)

- Where the effluent dispersal system is located more than 1,200 feet but less than 2,500 feet from a public water system's surface water intake point, within the catchment area of drainage, and located such that it may impact water quality at the intake point such as upstream of the intake point for flowing water bodies, the dispersal system shall be no less than 200 feet from the high water mark of the reservoir, lake, or flowing water body. (OWTS Policy 9.4.10.5)

Exceptions

1. For replacement OWTS that do not meet these horizontal separation requirements, the replacement OWTS shall meet the horizontal separation to the greatest extent practicable. In such cases, the replacement OWTS shall utilize treatment and other mitigation measures, unless the permitting authority finds that there is no indication that the previous system is adversely affecting the public water source, and there is limited potential that the replacement system could impact the water source based on topography, soil depth, soil texture, and groundwater separation. (OWTS Policy 9.4.11)

2. For new OWTS, installed on parcels of record at the time of effective date of this Policy, that cannot meet the above horizontal separation requirements, the OWTS shall meet the horizontal separation to the greatest extent practicable and shall utilize supplemental treatment for pathogens and any other mitigation measures prescribed by the permitting authority (SCEHD). (OWTS Policy 9.4.12)

SCEHD intends to regulate all OWTS not prohibited by the State OWTS Policy. Some wastes may be considered high strength wastewater, which is too "strong" or concentrated for discharge into

an OWTS. For example, concentrated wastewater discharged from R.V. holding tanks or winery operations (not from tasting rooms), which has resulted in numerous failing OWTS and are more appropriate for storage in holding tanks and removal and transport by septage pumpers to a municipal waste water treatment facility or regulated septage ponds.

1. D. EXISTING PARCELS (OWTS Policy 9.1.11) (OWTS Policy 9.1.12) (OWTS Policy 9.2.3) There are thousands of existing parcels within Shasta County that have been developed using OWTS for sewage disposal/treatment purposes. SCEHD is aware that many existing OWTS may now be considered substandard as a result of their development prior to the adoption and implementation of current or historical Shasta County Sewage Disposal Standards (under standards less stringent than those required by the State OWTS Policy). Those systems may be on small lots, may not meet the new groundwater separation requirements of the State OWTS Policy, or may not meet all required setbacks. The OWTS serving these parcels will be carefully evaluated either under our complaint report program, when the system is evaluated after receipt of a repair/replacement permit application, or as part of a request to further develop the parcel(s). The intent of SCEHD would be to allow the continued use or uses on the parcel while bringing the OWTS serving the parcel into compliance with the State OWTS Policy to the greatest extent practicable.

The many existing undeveloped parcels in the County will be evaluated under this LAMP for compliance with the horizontal setback requirements to the greatest extent practicable. The minimum two-foot vertical separation between the bottom of the trench and groundwater, required by the State OWTS Policy, cannot be waived through the County's LAMP.

1. E. SEPTAGE CAPACITY AND SEPTIC PUMPER TRUCK APPLICATIONS AND REGISTRATIONS (OWTS Policy 3.3.2) (OWTS Policy 9.2.6)
Septage is the term used for the partially treated solid and liquid material removed from septic tanks, and some treatment systems, by septic tank pumper trucks. This material includes settled solids, fats, oils, grease, other floating materials, and some amount of liquid. This solid material must be removed from septic tanks to prevent the tank from filling up and potentially damaging the dispersal system or any supplemental treatment system that may be in use. Removal frequency is different for each system, based on tank capacity and use but generally is not less than every three years.

Septage Counties must ensure that a disposal site for septage is available. Shasta County has the following two septage disposal sites available:

1. Redding Regional Septage Impoundments have a capacity to receive 13 million gallons of septage annually. Average use is approximately 7.3 million gallons per year.

2. Fall River Mills Septage Impoundments have a capacity to receive in excess of 676,000 gallons of septage per year. Average use is approximately 280,000 gallons per year.

Each site has multiple ponds available for the discharge of septage from pumper trucks. When one pond fills, it is taken out of use and the liquid is evaporated. The dried sludge is removed to a permitted solid waste facility, restoring the impoundment for continued use.

Septic Pumper Truck Applications and Registrations
SCEHD requires applications from, issues registrations for, and inspects all registered septage pumper trucks annually within Shasta County. Inspections of pumper trucks by SCEHD primarily focus on health, sanitation, and safety issues relating to the trucks, equipment, and employees. Pumper/haulers are requested to notify SCEHD within 24 hours of the discovery of a failing OWTS with surfacing sewage.

1. F. DATA COLLECTION/REPORTING/NOTIFICATIONS/RESPONSIBILITIES
(OWTS Policy 9.3) (OWTS Policy 9.3.1) (OWTS Policy 3.3.1)
As a condition of SCEHD oversight of OWTS within Shasta County, SCEHD has certain responsibilities related to data collection and reporting to the CVRWQCB as well as, in some cases, the owners/operators of public water systems and the State Water Resources Control Board's Division of Drinking Water (SWRCB-DDW). This Section details the data that must be collected by SCEHD and the procedures for reporting to the CVRWQCB and notifications to owners of public water systems and the SWRCB-DDW.

Water Quality Assessment Program (OWTS Policy 9.3.2) (OWTS Policy 9.3.2.1) (OWTS Policy 9.3.2.2) (OWTS Policy 9.3.2.3) (OWTS Policy 9.3.2.4) (OWTS Policy 9.3.2.5) (OWTS Policy 9.3.2.6) (OWTS Policy 9.3.2.7) (OWTS Policy 9.3.2.8) (OWTS Policy 9.3.2.9)
SCEHD will maintain a water quality assessment program to determine the general operational status of existing OWTS and OWTS permitted under this LAMP. SCEHD will evaluate the impact of discharges from OWTSs, and assess the extent to which groundwater and local surface water may be impacted. This program will primarily focus on areas where shallow soils, fractured bedrock, shallow depth to a water table, a high concentration of OWTS exist, and a high concentration of domestic water wells and OWTS exist. Data collected for this program will include the results of investigations into complaints of failing OWTS, inspections of operating OWTS (by SCEHD staff and service providers), sample results from our Public Water System regulatory program, sample results submitted from local watershed management groups, and any other water samples of surface or ground water reported to or obtained by SCEHD staff (to include, but not be limited to loan well inspections, data from Geotracker GAMA, beaches, and monitoring wells from SCEHD or state agency permitted facilities). This monitoring program may identify areas requiring additional scrutiny of soil test results and designs for proposed OWTS (new, repaired, replacement, and increased capacity of OWTS) and possibly the need for more frequent inspections or maintenance of OWTS.

Records Retention (OWTS Policy 3.4)
At a minimum, SCEHD will retain permanent records of permitting actions and will make them available to CVRWQCB staff within ten working days upon written request for review. The records for each permit shall reference under which Tier (1, 2, 4) the permit was issued. Shasta

County Department of Resource Management currently uses a computer database to track permits for all projects evaluated by the four Divisions of the Department including current Sewage Disposal Systems Permits issued by the SCEHD and future OWTS permits. Paper copies of completed system applications, soil test data, final drawings, and other related documents are kept in the SCEHD office until the system has been granted final approval and then these documents are scanned into an electronic database.

Reporting to the RWQCB (OWTS Policy 3.3) (OWTS Policy 9.3.3)
A. On an ongoing basis, SCEHD will collect data and report by February 1st annually, in a format prescribed by the State OWTS Policy and must include the following information:

1. The number and location of complaints pertaining to OWTS operation and maintenance, and identification of those which were investigated and how they were resolved.
2. The number, location, and description of permits issued for new and replacement OWTS and under which Tier the permit was issued, noting any variance allowed for systems otherwise in substantial conformance with the standards.
3. The applications and registrations issued for sewage haulers as part of the septic tank cleaning registration program.
4. Results of the Water Quality assessment Program intended to evaluate the impact of OWTS on local surface water and groundwater. Any groundwater monitoring data collected shall be submitted in Electronic Deliverable Format (EDF) format for inclusion into GeoTracker, the SWRCBs database of which this data will have exclusive view by CVRWQCB staff. Surface water monitoring shall be submitted to the California Environmental Data Exchange Network (CEDEN) in a Surface Water Ambient Monitoring Program (SWAMP) comparable format. At this time, at a minimum, it is expected that groundwater monitoring will include, but not be limited to, any samples collected from small public water systems regulated by SCEHD and any other samples collected in response to home loan inspection requests, complaints, and samples that may be required from OWTS monitoring wells.

B. Every five years, an evaluation of the monitoring program and an assessment of whether water quality is being impacted by OWTS in use within Shasta County must be completed. The evaluation, prepared by SCEHD for the CVRWQCB, would need to identify any changes in the Shasta County LAMP required to address any impacts from OWTS.

Reporting to Owners of Public Water Systems and Division of Drinking Water at the SWRCB (OWTS Policy 3.5) (OWTS Policy 9.2.11) (OWTS Policy 9.2.12)
SCEHD 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 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, SCEHD 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 1200 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 SCEHD upon receipt of an application for a new or repair permit and prior to issuance of the permit. All notifications will be in letter format and mailed to the water system.

For OWTS permit applications for dispersal systems within the horizontal sanitary setback of a public well or a surface water intake point SCEHD shall first work with the owner of the proposed OWTS to see if relocation of the dispersal system 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 could not be relocated to meet the required setback (see the Technical Guidance Manual for discussion of treatment systems).

Reporting to SCEHD by OWTS Owners and/or Service Providers
As a condition of permits to install an OWTS within Shasta County, property owners and/or service providers are required to perform routine inspections, maintenance, and monitoring of those OWTS. These results will be reported to SCEHD on a frequency specified in their OWTS Permit, every two years for most systems, or immediately (within 48 hours) if a failure or upset condition occurs. The typical time intervals for inspections, maintenance, monitoring, and reporting for each type of supplemental treatment or alternate dispersal system in use are given at the end of each section discussing them in the Technical Guidance Manual.

Outreach Program (OWTS Policy 9.2.5)
SCEHD has copies of sewage disposal standards, percolation test instructions and data sheets, and other related documents are available to the public in our office and/or on the County website. All newly developed materials will be available when developed.

With few exceptions, documents in SCEHD files are public records. These include copies of OWTS documents such as permitting/installation records, site location drawings, and soil test data, copies of applications for permits to drill wells, copies of public water system sample results, or real estate loan water sample results, soil test results conducted as part of a proposed land division, and other records that may relate to OWTS.

Upon request, SCEHD staff can provide presentations to local homeowner or industry groups or organizations regarding OWTS standards, use, operation, design, construction, and maintenance.

In addition to OWTS construction permits, SCEHD will be issuing Operating Permits for OWTS constructed at sites with soils that do not meet the minimum Tier 1 requirements. These permits

will require notification, within time frames specified, of any failure or upset conditions with the permitted system. Additionally, SCEHD will require that an operations and maintenance plan be prepared for each system by the Qualified Professional designing the system. This document shall be provided to the property owner and will include (as will the SCEHD issued Operating Permit) procedures to ensure maintenance, repair, or replacement of failing critical items within 48 hours following discovery. To assist system owners in providing proper maintenance and repairs to their system and in reporting upset conditions, we will have available on our website a list of service providers, in addition to the list of Qualified Professionals currently on our website. This will include 24 hour contact numbers when available.

Should SCEHD implement a voluntary well monitoring program at some future date, the outreach program will include information on how well owners may participate.

SCEHD Responsibility

Permits issued for the construction of a new or replacement OWTS requiring an Operation and Maintenance (O&M) Plan shall be prepared for the OWTS owner by a qualified professional. This Plan will detail operating procedures and maintenance requirements and frequencies.

SCEHD will establish and maintain a record keeping and reporting system to ensure that current records are kept detailing the location, ownership, site evaluation, design, and O&M reports so that the performance of the systems approved under Tier 2 can be monitored.

SCEHD will monitor and analyze the performance of OWTS within the County by reviewing O&M data.

SCEHD will assure timely follow-up and correction, including enforcement action when necessary, when problems are encountered with treatment or dispersal technologies which are being monitored through the O&M program.

SCEHD may perform O&M inspections, as needed, for quality assurance/quality control, surveys, and investigations.

Property Owner, Qualified Professional, and Service Provider Responsibility

Property owners, qualified professionals (consultants/designers), and service providers (system operators and maintenance technicians) all have responsibilities with respect to the use, operation, maintenance, inspection, and reporting related to all OWTS permitted in Shasta County. The failure of one of these team members to abide by their respective responsibilities may result in premature upset or failure of the OWTS. Failure of an OWTS can lead to surface water or groundwater contamination with untreated or partially treated wastewater and potential public health hazards. Another result of a failing OWTS is the expense to repair or replace the system. This can be equal to, or more than, the construction cost of the original system.

Property Owner
Every onsite wastewater treatment system requires care with use and timely maintenance to continue to function as they are designed to function. An OWTS is sized for an expected use. A number of OWTS have failed due to misuse or use beyond that expected when the system was designed and constructed. Using the system beyond its design flows will lead to premature failure. Using the system to dispose of large quantities of household cleansers or disposal of a wastewater stream different from that which the system was designed for can significantly reduce the life span and effectiveness of the OWTS. A property owner must be accurate with the proposed use, quantity and wastewater stream, when discussing the proposed OWTS with their consultant and with SCEHD.

All OWTS require maintenance. This can be as simple as having the septic tank inspected and pumped on a regular basis to the necessarily more thorough inspection and maintenance of supplemental treatment systems. Generally, most permits issued under this LAMP include at least some inspection, maintenance, monitoring, and reporting requirements depending on the complexity of the system installed. Additionally, timeframes are specified for these activities. An owner of an OWTS must adhere to these tasks at their specified timeframes to assist in keeping these OWTSs operating as designed. Owners must contract with a Service provider, familiar with the type of OWTS in use, to conduct the inspections, maintenance, monitoring, and reporting tasks, as required at specified timeframes, by a valid installation/operating permit. An owner must correct deficiencies in the OWTS that have been identified by SCEHD and/or a service provider.

SCEHD does not currently regulate the construction and use of graywater systems. These systems are permitted by the Shasta County Building Division (SCBD) under a plumbing permit. SCBD will consult with SCEHD as necessary. An OWTS is designed for a specified wastewater strength and quantity. Property owners should be aware that, in the extreme, the use of a graywater system may have an impact on an OWTS in use at a site. Be sure that the Qualified Professional and SCEHD staff are aware that a graywater system may be constructed or consider an alternative OWTS, such as a drip dispersal system, allowing OWTS liquid waste to assist in watering vegetation at the site. SCEHD does not allow a reduction in the size of an OWTS when a graywater system is proposed at a site.

Qualified Professional (OWTS Policy 9.1.7) (OWTS Policy 9.1.10) (OWTS Policy 9.2.4)
Every new/proposed OWTS, and most onsite system repairs, must be designed by a Qualified Professional (see definitions in Appendix A). Qualified Professionals will test each site, recommend a system for the site based on test results and site soil and groundwater depths, and design and provide specifications for that system. The Qualified Professional must be certain that the system is being designed for the proper wastewater strength and flow.

The Qualified Professional will consider potential pathways of wastewater-sourced phosphate and other nutrients toward potentially threatened nearby surface water bodies, when present. They will also consider hydraulic mounding, nitrate and pathogen loading, and sufficiency of potential OWTS replacement areas. The OWTS, potential replacement areas, and all proposed site

improvements and structures must fit onto existing and proposed parcels while meeting or exceeding all appropriate setbacks and would be verified by the Qualified Professional on the site plan.

The Qualified Professional must work with the installer to ensure that the system, as constructed, meets the specifications of their design and the permit issued by SCEHD. An accurate site plan, showing the system location must be prepared and provided to the property owner.

An operation and maintenance plan prepared by the system designer, and made available to the system owner is required of every alternate dispersal or supplemental treatment system installed on parcels in Shasta County. Proper use and routine maintenance at specified intervals, as specified by SCEHD in a valid OWTS operating permit, is necessary in order for an OWTS to function as designed for as long as possible. The OWTS designer (Qualified Professional) shall prepare the following operations and maintenance plan:

- An accurate scale drawing showing the actual location of the OWTS installed on a parcel for ease in locating the system for inspections, maintenance, and monitoring. The drawing is to include the location of all system components;
- An Operations and Maintenance Manual specific to the type of system installed. It shall contain a narrative describing how the system achieves its treatment standards/goals. The manual shall note homeowner or service provider procedures to ensure maintenance for continued operation, repair, or replacement within 48 hours of identifying a failing system. The manual is to detail the type of maintenance or monitoring required and when these tasks should be done;
- Identify if the tasks can be performed by an owner or if a Service provider is the more appropriate choice to perform them;
- The plan shall include the names and telephone numbers of the Qualified Professional , licensed system installer, and OWTS Service provider, and;
- Identify the reporting required to SCEHD as a result of these inspections, monitoring, and maintenance or actual failure conditions.
- The plan is to be amended if the system is upgraded or requires repair.

Service Provider (OWTS Policy 9.2.4)

The property owner must contract with a Service provider (see definitions) to provide necessary inspection, maintenance, monitoring, and reporting services as specified in a valid OWTS permit as issued by SCEHD. Most OWTS owners may not understand how a system functions and recognize signs that the system needs maintenance or is failing. It is extremely important that the Service provider completes the required tasks to keep the system operating as planned.

When required by providers of proprietary equipment, the Service provider must meet and maintain the requirements for qualification for the specific proprietary equipment.

The Service provider shall provide all maintenance records to the property owner and report any system malfunction that results in surfacing sewage to the owner and SCEHD within 48 hours.

1. G. OWTS NEAR IMPAIRED WATER BODIES (OWTS Policy 9.1.8) (OWTS Policy 9.2.2)
Currently, there are no impaired water bodies in Shasta County listed in Attachment 2 of the State OWTS Policy. At such time as an impaired water body is listed, SCEHD will follow the applicable specific requirements of the State OWTS Policy.

Onsite Maintenance Districts (OWTS Policy 9.2.7)
There currently are no onsite maintenance districts or zones within Shasta County nor are any anticipated in the foreseeable future.

Regional Salt and Nutrient Management Plans (OWTS Policy 9.2.8)
There are no existing regional salt or nutrient management plans within Shasta County nor are any anticipated in the foreseeable future.

Watershed Management Groups (OWTS Policy 9.2.9)
Currently, SCEHD has no formal agreements with any watershed management groups within Shasta County.

1. H. PARCEL/LOT SIZE REQUIREMENTS (OWTS Policy 9.1.2) (OWTS Policy 9.1.10)
Shasta County has a two-acre minimum for new parcels. It should be noted that there has not always been a minimum lot size for existing lots to be served by an OWTS and many small parcels have been created over the years. Either way, the OWTS, including the 100 percent replacement area, shall meet all applicable setbacks to all proposed structures which include, but are not limited to, dwellings, wells, pools, barns, shops, garages, driveways, and other graded/paved/concrete areas which shall fit on the property without interfering with the OWTS.

See Section 4 for related documents that provide specific requirements regarding the creation of new parcels (land divisions) within Shasta County. Minimum parcel sizes are required by the County and the cities land use agencies per specific site zoning. Any proposal for a development with acreage less than this may be considered but would receive greater scrutiny by SCEHD of pathogen transport and cumulative nitrogen and hydraulic mounding impacts.

1. I. HIGH DOMESTIC WELL USAGE AREAS (OWTS Policy 9.1.4) (OWTS Policy 9.1.9) (OWTS Policy 9.1.11) (OWTS Policy 9.1.12)
A majority of Shasta County residents are served by public or privately operated water systems. These include systems operated by the three incorporated cities, Burney, Johnson Park, and Fall River unincorporated areas, several larger public water systems such as the Bella Vista, Clear Creek, Mountain Gate, and Centerville Water Districts, a number of County-operated service area water systems, and approximately 160 small public water systems regulated by SCEHD. An estimated 160,000 Shasta County residents receive water from these public systems.

Overall, the population of Shasta County is estimated at nearly 190,000 leaving approximately 30,000 persons served by private domestic wells and some individual spring and surface water systems. The majority of these individual wells are on parcels with an OWTS. There are at least two areas that might be considered high domestic well usage areas with OWTS:

1. Churn Creek Bottom. This is a small to medium parcel agricultural area with irrigation water provided during the warmer months. The residential development density runs from sparse to dense within the Churn Creek bottom. Some older developments occurred with small parcels served by wells and OWTS or larger parcels with wells and OWTS clustered along frontage roads.

2. Henderson Road area. This is a mostly developed dense residential area of small parcels, many with individual wells and OWTS.

SCEHD staff are not aware of any nitrogen impacts to groundwater as a result of the OWTS density in these areas. There are vast areas of Shasta County developed on wells and OWTS but the density is not high enough to be defined as high domestic well usage areas.

SECTION 2. ONSITE WASTEWATER TREATMENT SYSTEMS PERMITTING PROCESS (OWTS Policy 9.2.1)

2.A. STATE, COUNTY, AND CITY ROLES

State / County Coordination

OWTS discharge pollutants to groundwater and, therefore, are regulated by the State Water Code. Water Code Section 13282 allows the CVRWQCBs to authorize a local public agency to issue permits for and to regulate OWTS "to ensure that systems are adequately designed, located, sized, spaced, constructed, and maintained". The CVRWQCB, with jurisdiction over Shasta County, authorizes only the SCEHD to issue certain OWTS permits throughout the County including area within the three incorporated cities, when necessary.

Through the State OWTS Policy, the CVRWQCB has imposed conditions and restrictions on the County's permit program. SCEHD is authorized to issue permits for conventional OWTS and alternative OWTS with or without supplemental treatment within the County. The Adopted State OWTS Policy requires a minimum of five feet and up to twenty feet of separation maintained between the bottom of a dispersal system point and the highest anticipated groundwater level for conventional OWTS, and at least two feet of separation be maintained for some alternative dispersal systems, including some with supplemental treatment.

The goal of SCEHD's LAMP is to ensure that installed OWTS will last the life of any structure they serve and not cause any public exposure to surfacing sewage or potential contamination of groundwater or surface waters. The separation requirements are a condition of the State's authorization for Shasta County to issue OWTS permits locally. The Technical Guidance Manual describes in detail how the County ensures that these State-imposed separation requirements are determined and met.

SCEHD / Land Use Agency Coordination

A fundamental point that persons seeking OWTS permits must remember is that the County OWTS permit process and local agency land use approval and permitting are essentially separate processes. While they are coordinated to a great extent, persons seeking OWTS permits from SCEHD should also review and ensure compliance with applicable site grading, land use, and building requirements.

Similarly, no local land use approval or permit, including, but not limited to, approved land divisions, property line adjustments, use permits, is a substitute for a County OWTS permit, or a guarantee that such a permit will be issued.

2.B. SYSTEM DESIGN CONSIDERATIONS

The most common type of conventional OWTS found in Shasta County consists of a septic tank connected to leach lines. In all cases, the majority of solids, fats, oil, and grease are removed in the septic tank and effluent from the septic tank is discharged below the ground surface, and organic material present in this effluent is digested by bacteria in unsaturated soil zones for

treatment of the effluent underground. These systems are designed to operate in all weather conditions with minimal maintenance, other than periodic septic tank pumping to remove accumulated sludge and floating scum that form in the septic tank. Under this LAMP, sites with Tier 1 minimum of 5 to 20 feet of soil beneath a dispersal system trench, based on soil percolation rates, would not require mitigation or monitoring and a septic tank and leach line dispersal system could be constructed under as authorized by a valid OWTS Permit.

In addition to conventional OWTS, Shasta County allows the use of alternative or non-conventional systems. These systems are generally used for those sites that cannot support the use of a conventional OWTS due to shallow ground water, soil permeability problems, or soil depth problems. A variety of OWTS mitigations were accepted in the past to deal with these specific site conditions including shallow trenches, pumps, curtain drains, dual leach fields, and other systems and these were known as non-conventional systems. At a minimum, some of these systems within Shasta County may have had as little as one foot of separation between the bottom of a dispersal system and the highest elevation of groundwater, primarily a perched seasonal water table resulting from precipitation and/or irrigation. The Approved OWTS State Policy now sets a minimum soil depth and separation from groundwater at two feet with the use of a supplemental treatment and/or dispersal system to treat septic tank effluent prior to discharge into the soil. The SCEHD Director may allow the use of other systems not otherwise prohibited by the State OWTS Policy.

The size and type of OWTS necessary for a residence or other use will nearly always be a function of the following factors:

1. Soil Permeability. Permeability determines the degree to which soil can accept septic tank or supplemental treatment system effluent over a period of time. Permeability is determined by a percolation test and is reported as a percolation rate, in minutes per inch.

2. Unsaturated Soil Interval. The distance between the bottom of the OWTS dispersal field and the highest anticipated groundwater level or the impervious subsurface layer at the site.

3. Peak Daily Flow. The anticipated peak sewage flow in gallons per day. In many cases the number of bedrooms for a proposed home is used as an indicator of peak daily flow. Daily flow in non-residential uses is calculated from expected flows from charts in the Uniform Plumbing Code, adopted by Shasta County, and other similar charts or actual flows of similar projects acceptable to the Director.

4. Net Useable Land Area. The area available that meets all setback requirements from structures, easements, watercourses, or other geologic limiting factors for the design/placement of an OWTS. A site may not be developed beyond its capacity to properly treat and disperse the amount of liquid waste expected/generated.

5. Wastewater Strength. Wastewater strength has been of some importance with non-residential systems such as restaurants or other commercial or industrial systems. This is because there may

be less water in the waste stream or more solid material, oils, fats, grease, or cleansing or sanitizing materials may be present when compared to those things expected in residential wastewater. Wastewater strength with residential systems may be more important in the future as graywater systems divert a large part of the liquid component of residential wastewater flow from the septic tank.

Some sites may not be acceptable for conventional or alternative OWTS based on high or low soil permeability and net useable area, regardless of the unsaturated soil interval available at the site.

All conventional OWTS in Shasta County will require five feet to twenty feet, based on soil percolation rates, between the bottom of the dispersal system and the highest anticipated groundwater level for the site. An alternative Tier 2 OWTS will require a minimum of two (2) feet and sometimes more. Depth to groundwater varies tremendously with the amount of precipitation and soil types for specific sites and areas within Shasta County, therefore, the highest anticipated groundwater level must be established for any OWTS design in order to meet this separation requirement. Details in determining depth to groundwater and overall soil depth are provided in Section 5 of this LAMP.

The net useable land area required for an OWTS will usually depend on soil permeability, soil depth, expected peak daily flows and the required 100 percent dispersal system replacement area.

2.C. PERMITS ISSUED (OWTS Policy 3.3.3)

Historically, SCEHD issues an average of approximately 225 Sewage Disposal System Permits annually, depending on development, as follows:

- 3 permits to abandon systems no longer needed;
- 103 new standard or conventional system permits;
- 7 new non-standard or non-conventional permits, and;
- 112 permits to replace failing or inadequate systems.

Under the County's approved LAMP, we would expect to continue to issue a similar number of total permits in different categories annually, depending on development, as follows:

- 3 permits to abandon systems no longer needed;
- 45 new conventional system permits (not requiring treatment or alternate dispersal);
- 65 new Tier 2 permits (with supplemental treatment and/or alternate dispersal);
- 40 repair permits (without supplemental treatment or alternate dispersal), and;
- 72 repair permits (with supplemental treatment and/or alternate dispersal).

Under our current Sewage Disposal Systems Ordinance, new systems were considered conventional or non-conventional. Non-conventional systems are systems that require some mitigation as the sites did not outright meet the minimum soil standards required to construct a standard system in Shasta County. These mitigations include shallow soil depth, too fast or too

slow soil percolation rates, use of a curtain drain to dewater a site, installation on steep slopes, and use of a pump from the sump to reach the dispersal field.

Our intent is to eliminate the non-conventional systems from the ordinance and use a larger variety of mitigations under the Tier 2 LAMP to protect public health and water quality within Shasta County. These mitigations and system requirements are contained in the Technical Guidance Manual which includes guidance on a variety of supplemental treatment and/or alternate dispersal systems. Additionally, for any OWTS with supplemental treatment or an alternate dispersal system, an operating permit will be issued that will require the completion of inspections, maintenance, water monitoring/sampling, and reporting as detailed in the "Management Requirements" at the end of each specific supplemental treatment and alternate dispersal system section of the Technical Guidance Manual.

2.D. CESSPOOLS (OWTS Policy 9.2.13) (OWTS Policy 9.4.1)

A cesspool is a hole excavated into the ground to receive domestic wastewater from a structure. A cesspool does not have a tank or other water tight settling chamber nor does it have a proper pipe inlet/outlet, or a dispersal system to assist in effluent treatment and safe disposal. Cesspools have not been approved for use in Shasta County per our Sewage Disposal Standards dating to the mid 1970's. Cesspools are not authorized by this LAMP.

Any existing cesspool discovered by SCEHD through our 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 this LAMP under the same process noted in Section 3, Failing OWTS and Corrective Action. Permits will not be issued for the construction of any cesspool.

2.E. RV HOLDING TANK WASTE (OWTS Policy 9.4.7)

Under the State OWTS Policy, SCEHD is prohibited from issuing permits for systems that receive a significant amount of wastes from RV holding tanks. Such systems are regulated by the RWQCB. SCEHD may issue permits for OWTS that receive RV holding tank wastes as long as those wastes are incidental to a more "normal" waste stream, such as a home with an RV waste dump station for use by the homeowner.

2.F. STEPS IN THE PERMIT APPLICATION PROCESS

All OWTS permit applications for new construction, repairs, or additions within Shasta County will be submitted to SCEHD.

Steps in the Permitting Process

In general, a "complete" OWTS permit application contains a completed application form, an accurate site plan, soils test results, and appropriate fees.

Soil Test Data

Soil test data may include a soil profile, percolation tests, groundwater monitoring results, and/or soil boring logs. The specific test data required is determined by the type of system proposed and may be modified as the results of those tests are being conducted. Soil tests are typically required when:

- An existing parcel, created prior to soil 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;
- An existing septic system fails or is proposed for expansion and no previous soil test data is available for the specific parcel.

SCEHD staff will review soil percolation and other test data submitted with the application and determine if the tests are adequate or if additional tests are needed. Parcels created since 1982 (and on some earlier dates for a few land divisions) would have been created with five-foot deep soil profiles to verify that at least four feet of suitable soil exists. Groundwater monitoring in five-foot deep monitoring wells (or other alternate method), was required when the inspection of the five-foot deep pits did not clearly delineate the depth of a seasonal water table. Water was allowed to be present at depths of four feet but possibly as shallow as two feet for up to two weeks at a time. This soil test data does not expire and this data should be adequate to allow a permit to be issued for an OWTS with an alternate dispersal or supplemental treatment system without the requirement for additional testing.

Project applicants are welcome to conduct additional tests to determine if soils at the site meet the more restrictive depth standards under this LAMP with the goal of constructing a conventional or less costly system. Additional tests would be required if the construction of a specific type of OWTS proposed for a site cannot be supported by the data on hand.

In general, most parcels created prior to 1982 were created with currently inadequate (under this LAMP) soil tests or without soil test requirements at all. Adequate soil testing would be required to verify that these sites meet either the conventional OWTS (Tier 1) or alternate dispersal or supplemental treatment OWTS requirements (Tier 2 LAMP).

All required soils tests shall be conducted by, or be under the supervision of, a qualified professional such as a registered civil engineer, registered environmental health specialist, or a soil scientist.

With percolation tests and other soil data in hand, the applicant must develop and submit an accurate site plan for the proposed building project and the proposed OWTS. The site plan must take percolation and other soil test data and this guidance into account.

Application Site Plan

The application form identifies the location of the property, owner, applicant if not the owner, contractor, proposed use, parcel size, specific assessor parcel number, and proposed water supply for the proposed project. The application identifies any previous land use projects that may have required that soil test be conducted. The application also identifies the OWTS project as a new installation, a replacement, or a repair.

A complete OWTS permit application includes a detailed, accurate site plan which at a minimum depicts the following:

- The outline and dimensions of the parcel.
- The property owner's name.
- The assessor's parcel number for the property.
- The address of the property.
- A North arrow and scale.
- The acreage of the property.
- Dimensions/square footage/footprint and use of all structures.
- Indicates whether there are mobile homes or houses and indicate whether there is a garage attached to the house.
- Easements shown and labeled.
- All OWTS and well locations, both existing and proposed. Also shows the distance to all neighboring OWTS and well(s).
- Shows the required 100 percent dispersal system replacement area.
- All roads and driveways shown and labeled, list length, width, and turn radius, and estimate grade.
- Drainages and waterways shown and labeled, including roadside ditches, seasonal or dry creek beds, and distance(s) from existing and proposed OWTS.
- Indicates distances to toe and/or top of slopes and cuts, whichever is appropriate.
- Delineates areas and depth of fill.
- Shows the locations of all percolation tests, soil profile pits, borings, and groundwater monitoring wells. An accurate plan showing all percolation tests, soil profile pits, groundwater monitoring wells, and/or soil borings must be prepared by a qualified consultant for submittal with the permit application.
- Shows all existing and proposed grading including depths of cuts and fills.
- Additional information may be requested for a proposed OWTS based on specific site features or conditions.
- Delineates flood plain, when applicable.

2.G. PERMIT APPLICATION REVIEW AND PERMIT ISSUANCE

SCEHD staff would review all available soil test data, the site plan, and application to determine if adequate information exists to issue an OWTS permit. Typically, SCEHD staff would make a site visit of the property to perform a site evaluation to verify that the soils data and site plan accurately reflect conditions at the site. After review, if it appears likely that the proposed OWTS (including 100% replacement area) will fit into the site and will function properly, SCEHD will issue a OWTS Permit. Shasta County requires, and typically the city land use agencies require, an approved OWTS permit before any building permits are issued.

SCEHD may allow variances from the State OWTS Policy with regards to horizontal separation. New installations and repairs shall conform to the Policy to the greatest extent practicable. SCEHD staff will work with applicants to determine if relocation of the proposed OWTS is possible to potentially avoid the requirement to add a supplemental treatment system. Variances will not be allowed for the creation of new parcels after the effective date of this LAMP. Records of the number, location, and description of permits issued for OWTS where a variance is granted shall be maintained for the annual report to the RWQCB. (OWTS Policy 9.2.3) (OWTS Policy 9.3.1)(9.4.11)

Grading or clearing of brush for the purpose of conducting a site evaluation and soil tests may require a grading permit issued by the Department of Resource Managements Building Division. The requirements for this grading permit in the unincorporated area of Shasta County and the three cities are available from the appropriate building agency. Any grading which damages or alters an approved or proposed sewage treatment dispersal area may be costly to correct, may delay the approval of a project, or may preclude the issuance of an OWTS permit.

2.H. FINAL INSPECTION (OWTS Policy 9.2.1)

Once an OWTS permit has been issued (and this issuance accepted by the cities), the OWTS can be installed. Such installation must meet all applicable requirements for OWTS construction in Shasta County and any special conditions specified for that site or permit. SCEHD staff may require a meeting with the system designer and installer at a pre-construction conference, as specified in the permit. The system must first be inspected by the system designer/qualified professional. If the qualified professional finds the system to be in compliance with the system design and issued permit, they would then request a final inspection by SCEHD staff. The system installation must be inspected and approved by SCEHD before the system can be backfilled. If this (or subsequent inspections if necessary) is satisfactory, SCEHD will provide a final approval for the OWTS permit. Occasionally, SCEHD will hold final approval on the OWTS permit pending the completion of specific conditions such as placement of backfill materials or final site grading.

Shasta County and the cities' land use agencies require that OWTS are installed and final approval granted by SCEHD before occupancy of structures is allowed. OWTS permits, once issued, will be valid for a period of one year. Extensions and renewals of these permits will follow appropriate policy.

2. I. PRIMARY AND REPLACEMENT/RESERVE AREA REQUIREMENTS

In addition to primary system design criteria, all OWTS design proposals, for both new construction and additions to an existing structure or approved use, must show 100 percent reserve area for eventual replacement of the active OWTS when it reaches the end of its usefails. The Director may require that the 100 percent replacement leach field be installed at the time the primary system is installed in the following situations:

1. The lot is less than one acre or is otherwise a difficult site to conduct a leach field repair, sites where adequate replacement space is limited, and sites with slopes greater than 30 percent.
2. The percolation rates are greater than 60 minutes per inch.
3. The use is a commercial projects, including food facilities.
4. Otherwise required by the Director for specified reasons.

A switching or alternating valve, to allow easy switching between fields, shall be installed at the time of construction where dual leach fields have been constructed to allow alternating use of fields at specified intervals.

2. J. SEPTIC TANKS

All conventional OWTS require the use of a water-tight septic tank to allow for the removal of solids and fats, oils, and grease from the wastewater prior to being discharged to a dispersal field. Most alternative or supplemental treatment OWTS will also require the use of a septic tank unless a settling chamber is a component of the treatment unit or treatment process. For specific information on the requirements for and sizing septic tanks, see Section 1 of the Technical Guidance Manual.

2. K. ALTERNATIVE OWTS TREATMENT SYSTEMS

On parcels not meeting the groundwater separation in Tier 1 of the State OWTS Policy, an alternative treatment system or dispersal system may be used to reduce the required separation to a minimum of two to three feet between the bottom of the dispersal discharge point and the highest anticipated depth to groundwater. Intermittent sand filters and recirculating sand filters can be constructed at sites from readily available materials or can be purchased as complete units from various manufacturers. Other alternative treatment units, commonly known as proprietary treatment units, can be purchased for installation and use at sites. See Section 3 of the Technical Guidance Manual for more information on the sizing, construction and design criteria, criteria for the selection of the appropriate system, and monitoring of supplemental treatment systems. The qualified professional hired by the property owner to conduct the necessary soils tests shall designate and properly size any treatment unit required for an OWTS on a particular parcel.

2. L. OWTS LEACH LINE DISPERSAL SYSTEMS

Dispersal systems for conventional OWTS in Shasta County typically consist of leach lines which are described in detail in the Technical Guidance Manual. Dispersal systems for alternative OWTS can also include subsurface drip dispersal, mounds, shallow pressure distribution trenches (with rock or sand), and At-grade systems. See the Technical Guidance Manual for more specifics on

the sizing, construction, design criteria, and monitoring of these systems. The qualified professional hired by the property owner to conduct the necessary soils tests shall designate and properly size the type of dispersal system to be used, including, but not limited to, construction trench and backfill depths. The State OWTS Policy prohibits the installation of dispersal systems with less than 2 feet of separation between the bottom of the dispersal system and the highest elevation of a seasonal water table and this is reflected in the siting criteria of each specific dispersal system as discussed in the Technical Guidance Manual.

2. M. SETBACKS/VARIANCES (OWTS Policy9.2.3)

Setbacks required in the siting and construction of septic tanks, alternative treatment units, and dispersal systems are given in the charts in Appendix B. It is anticipated that repairs to some failing OWTS will require a variance from these setbacks. Variances are evaluated by staff, and if deemed necessary, may be approved. SCEHD is committed to meeting setbacks to the greatest extent practicable while maintaining the continued use or occupation of the property by owners.

2. N. PROXIMITY TO PUBLIC SEWERS (OWTS Policy 9.2.10) (OWTS Policy 9.4.9)

SCEHD staff will require connection to a public sewer whenever a project is proposed near public sewers. SCEHD staff will rely on the agency operating the public sewer to make the determination of availability as guided by Section 1. C. of this LAMP.

SECTION 3. FAILING OWTS AND CORRECTIVE ACTION (OWTS Policy 9.1)

All OWTS have the potential to fail due to age, misuse, improper design, and/or construction. The failure may result in waste water backing up into plumbing fixtures, waste water discharge to the ground surface, effluent surfacing over a dispersal system area, or wastewater or effluent discharge into, and contamination of, potable groundwater or surface water. These failure conditions will require corrective action to mitigate potential risk to public health and/or contamination of the groundwater and the environment. Corrective action will be required in the event that an OWTS fails. Subsequently, enforcement actions may be necessary if corrective action is not completed within acceptable time frames.

Traditional leach field systems, even when designed and constructed correctly, progressively fail resulting in diminished capacity of some or all of the leach lines. Effluent from septic tanks distributed into leach lines eventually forms a clogging biomat, restricting the flow of effluent into the soil for treatment. Effluent would then need to travel further into a leach line to find porous soil. Eventually, all of the leach lines would be clogged by this biomat-coated soil and the system would no longer accept liquid, resulting over time in a failing system with sewage backing up into a structure or surfacing above a leach field.

Tree roots are another cause for system failure. Tree roots can enter the pipe and rock of a leach line and over time totally plug the leach line, again resulting in either a sewage backup to structures or surfacing effluent.

Less frequently, some change may have been made to site contours or drainage that adversely impacted the leach field, such as site grading or driving vehicles over the leach field, or shallow groundwater was present at the site but was not evident in soil pits or other tests again resulting in a failing system. These, and other similar causes of a failing system are referred to as a major failure generally resulting in the need to replace the entire leach line or other dispersal system.

Other examples of major failure would be a septic tank that was somehow damaged or was no longer watertight allowing the discharge of untreated sewage or the infiltration of groundwater into the tank. These could possibly be the result of the tank settling over time, the growth of tree roots into the tank, driving heavy vehicles or storing heavy items over the top of the tank, or improper setting of the tank when the system was originally constructed.

Examples of less serious or minor failures, and more easily repaired defects, would be a cracked distribution box or a crushed solid line between the septic tank and the distribution box.

Whatever the reason or severity, a failing system, or component, that may result in surface or groundwater contamination or a public health hazard shall be corrected, without delay, under a valid OWTS permit issued by SCEHD.

3. A. PROGRESSIVE FAILURE OF A LEACH FIELD

As discussed above, a newly constructed leach field progressively fails through normal use over time. Every system is different, depending on the soil type and construction variables, as is every household's use of a system. Progressive failure(s) may take several years to many decades to completely result in a failing leach field with sewage backups or surfacing onto the ground surface. This is the normal life span of a leach field system with the time span being somewhat unpredictable due to the variables. This progressive failure or diminished capacity is expected and is perfectly normal. This does not mean that the system is failing until liquid is no longer accepted into the soil. It does mean that the system is working as designed and as expected, yet reaches the end of its use. Short of excavating into a leach field, or measuring liquid levels in inspection wells into leach fields (when equipped), there is no accepted test that can demonstrate the degree toward which a system has progressed towards total failure and measure how the capacity of the leach field has diminished.

Today, there are some simple things that can be done to limit or delay this diminished capacity by progressive failure and extend the life of a leach field or other dispersal system. One inexpensive way is to install an outlet filter on a septic tank or pump tank. This filter will remove larger solids particles not removed in the septic tank to delay the formation of a thick, plugging biomat in a dispersal system. Another, but more costly method, is to pressure dose the entire leach or dispersal system equally. This will dose the entire dispersal system equally instead of dosing only the first few feet of a leach line as has been the practice up to now. Many alternate dispersal systems use one or both of these methods to extend the life span of dispersal systems by delaying the formation of a thick biomat.

All OWTS require periodic pumping, inspections, or maintenance to keep the system in proper working order and assure adequate treatment of effluent. Owners of property served by an OWTS must maintain their OWTS in good working order as failures may result in groundwater or local surface water contamination, health hazards, and costly corrective actions. Owners of OWTS that utilize a supplemental treatment or alternate dispersal system shall contract with a service provider, who is capable of operating, monitoring, and maintaining an OWTS in compliance with this LAMP, and carrying out the appropriate inspections, maintenance, monitoring, and reporting required in the OWTS Permit conditions.

3.B. CORRECTIVE ACTION REQUIREMENTS (OWTS Policy 3.3.1) (OWTS Policy 9.2.1)

1. SCEHD will conduct an investigation in a timely manner to determine the validity of a OWTS repair/replacement permit application, complaint report, or other notification of a failing OWTS or component, or the discovery of a cesspool in use. Upon receipt of a complaint report from a member of the public or a notification by a property owner or service provider, a violation file will be generated with an assigned tracking number.

2. Upon investigation and confirmation of a failing OWTS, SCEHD 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 system has been repaired/replaced and final approval granted by SCEHD. If known, the Notice of Violation shall note why the system is failing and with specific corrective actions needed. SCEHD 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.

3. The proposed repair/replacement by a property owner and/or contractor in an OWTS Permit Application shall be evaluated by SCEHD to ensure it meets the minimum design requirements of this LAMP or that the proposed repair is otherwise in substantial conformance to the greatest extent practicable.

4. Any OWTS component failure, other than those listed in 5 and 6 below, such as a broken distribution box or broken piping connection (a minor failure), shall have that specific component repaired in a timely manner, under permit and inspection from SCEHD, so as to return the OWTS to proper functioning condition without the requirement to bring the entire OWTS into compliance with this LAMP.

5. In the event of failure of a septic tank (a major failure), such as a baffle, "tee", or loss of structural integrity, or groundwater intrusion or sewage/effluent discharge, SCEHD will require that the septic tank be repaired or replaced to bring the tank into compliance with the septic tank specifications in this LAMP within a timely manner. An OWTS Permit Application will be required and a permit must be issued by SCEHD noting the corrections required. The system may not be backfilled or placed into use without an inspection and final approval from SCEHD.

6. In the event of the failure of a supplemental treatment system or a dispersal system (a major failure), the failing system and/or components shall be brought into compliance with this LAMP within a timely manner. Replacement of the failing system with a conventional or alternate dispersal system or supplemental treatment system will be specified in an OWTS Permit issued by SCEHD. The system may not be backfilled or placed into use without an inspection and final approval from SCEHD. Supplemental treatment may be required in situations where ground or surface waters have been impacted by the failing OWTS.

7. Failure of either the septic tank, supplemental treatment system, or dispersal system may also lead to failure and required replacement of other components of the OWTS. Proper pumping, inspections, maintenance, and monitoring of the OWTS would be expected to reduce the frequency and severity of a failing component or multiple components.

8. Soils test by a qualified professional may be required, at the discretion of SCEHD, 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 newly constructed systems: five (5) to twenty (20) feet (based on soil percolation rates) for conventional systems and as little as two (2) feet for systems with supplemental treatment and/or an alternate dispersal system and must be repaired to meet the LAMP requirements to the greatest extent practicable.

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

10. Failure to complete the required corrective action within the time frames given will result in enforcement action which may include referral to the Shasta County District Attorney or City Attorney or Code Enforcement staff and could ultimately result in condemnation of the structure for immediate health hazard to residents and/or the public.

11. SCEHD will pursue, but cannot guarantee the availability, of potential funding for required corrective actions, such as the State Water Board's Clean Water Revolving Fund for mini-loans, and upon request, will advise property owners of other known funding sources depending on their situation.

3.C. SUBSTANDARD SYSTEMS

The Shasta County Building Division's Permit Waiver process allows SCEHD to evaluate sizing of an onsite system to ensure it is adequate for replacement residence or bedroom additions. Parcels with OWTS that are found to be substantially out of compliance with this LAMP shall be prohibited from having future additions to structures or other modifications to the property that would potentially increase wastewater flow to the OWTS or decrease the amount of useable area available for the OWTS. A new OWTS permit may be required to repair, replace, or add OWTS components to bring the system into compliance with this LAMP to the greatest extent practicable. The permit application would require any fees, test data, or system designs plans or specifications deemed necessary by the Director.

This section is currently adopted as County Code Chapter 8.40 and the Shasta County Development Standards Chapter 5– *the current version was adopted in 2001.*

SECTION 4. LAND DIVISIONS OF PARCELS SERVED BY OWTS

Currently within Shasta County, a site must have at least 48 inches of soil and a minimum ½-acre wastewater treatment dispersal area to qualify for a land division when not served by public sewer. Some variation is allowed in groundwater monitoring as water rises to within 24 inches of the ground surface as long as the depth falls to at least 48 inches within two weeks. This LAMP will still allow the division of parcels to occur; however, supplemental treatment systems and/or alternate dispersal systems may be required and leach fields will ultimately be much shallower than under previous standards.

References below to the Director of Environmental Health include his/her designee.

A. Land Divisions Not Served by Public Sewerage

1. Dispersal Area

a. Each parcel shall contain one or more dispersal areas, each consisting of minimum ½-acre of useable dispersal material in locations which could reasonably be utilized by a structure built at a desirable location and feasible site.

b. Dispersal area shall not include:

(1) Land subject to flooding. In case of disputes concerning flooding potential, the flooded area shall be determined by calculating the expected 10-year frequency flood.

(2) Land closer than 200 feet to a lake or reservoir, measured from the high water line or 100 feet if down slope from the lake or reservoir.

(3) Land closer than 200 feet to any spring, or 100 feet if downhill from the spring.

(4) Land within 100 feet of any existing or proposed well site for the parcel or any adjoining parcel (however, this may be increased to as much as 200 feet for public wells).

(5) Land closer than 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.

(6) Land closer than 50 feet to an ephemeral stream, measured from the edge of a channel. An ephemeral stream is one which flows for less than five days after the passage of a storm. It contains no water from a spring, snow, or other long-continuing surface source and does not discharge to a perennial aquifer.

(7) Land closer than 50 feet downhill from an irrigation ditch or canal.

(8) Land closer than 50 feet uphill from an existing or proposed cut.
(9) Land with a grade steeper than 30 percent.
(10) Filled land, unless the fill is engineered for sewage dispersal and approved by the Shasta County Director of Environmental Health.
(11) Dredger tailings.
(12) Gravel bars of very porous materials adjoining a stream or body of water.
(13) 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 unconventional release, easement, or license for sewage dispersal within the easement.
(14) Dispersal system within 1,200 feet of public water system intake point.

2. **Dispersal Material Characteristics**

Useable dispersal material has both the following characteristics:

a. Percolation rates between 1 and 120 minutes per inch when tests are conducted by the method specified in the Manual of Septic Tank Practice, U. S. Department of Health and Human Services.
b. Depth to a seasonal water table, as determined by the procedures in A.3.c., shall be at least four feet.

3. **Percolation Test, Test Pits and Groundwater Monitoring**

a. Percolation Tests.

Two percolation tests representative of the dispersal area shall be conducted on each proposed dispersal area at a depth of three feet and one or more tests are to be conducted at a depth of 1 foot by the method specified in the Manual of Septic Tank Practice. For sites with percolation rates greater than 60 minutes per inch, three tests shall be conducted at 36 inches and at least one test at 12 inches.

b. Test Pit.

At least one test pit shall be excavated on each lot. It shall be at least two (2) feet wide and five feet deep for one acre lots. It shall be greater than nine (9) feet deep for lots smaller than one acre or for community leach fields. It shall slope towards one end at a rate no greater than 3:1. The soil profile shall be logged by a person qualified to perform percolation tests[1] and backfilled. At the request of the Shasta County Director of Environmental Health, pits will be excavated for examination by the Division. [1] *See paragraph d. below*

c. Groundwater Monitoring.

(1) The height of the seasonal high groundwater shall be determined by wet weather testing when any of the following is present:
(a) Vegetation tolerant of, or indicative of, a high water table present or in the vicinity of the parcel.
(b) High groundwater has previously been found in the vicinity.
(c) The test pits show cracked or creviced formations but no clear delineation of the top of the water table.

(d) Other conditions or historical data preclude accurate determination of the groundwater levels by dry weather observations.
(e) The test pit indicates less than five feet of the dispersal material over an impervious stratum or eight (8) feet for lots less than one acre or for community leach fields.
(f) Free water from seepage is observed in the test pit.

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

a. Direct Observation:

Measurements shall be taken at the time and intervals specified by the Director in response to local conditions. Except as otherwise directed, measurements (excluding land within the A.C.I.D. and possibly other irrigated lands) shall be taken at approximately monthly intervals from January 1 to April 30. Land requiring groundwater monitoring caused by A.C.I.D. irrigation water and within the A.C.I.D. or other irrigation water shall have monthly measurements taken beginning May 1 and ending August 31.

At least one observation well shall be included within each proposed dispersal area suspected of having groundwater less than four feet below the ground surface, except where a nearby monitoring well shows groundwater contours representative of the proposed dispersal area.

For a site to be acceptable for a conventional dispersal system (without mathematical modeling), the groundwater during the monitoring period shall not be less than four feet below the ground surface. If this limit is exceeded on 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 feet on any observation. If seasonal rainfall up to the April 30 cutoff date has not exceeded 80 percent of the normal rainfall, as determined by the nearest rainfall reporting station approved by the Shasta County Director of Environmental Health, during the period from December 1 to April 30, testing shall be continued the next year or the site may be evaluated by mathematical modeling or "Conditions Associated with Saturation". However, the Director 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.

b. Mathematical Modeling

Approval is based on the results of calculations that demonstrate that the site meets the conditions required in paragraph 3.C.(2)(a) for groundwater monitoring. Calculations shall be provided by a qualified professional knowledgeable in groundwater hydrology and be based on use of a 10-year rainfall return interval for the most critical situations.

(1) Monitoring Wells for Mathematical Modeling
Monitoring wells necessary to complete mathematical modeling require special design and observation.

d. All of the testing shall be done by, or under the supervision of a qualified registered civil engineer, registered environmental health specialist, or soil scientist certified by the Soil Science Society of America

The results of all percolation tests and groundwater monitoring shall be reported and the logs of all excavations shall be submitted to the Director. 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. The Director may disregard any test or log that, in his/her opinion, does not represent the soil conditions of the parcel.

4. **Soil Analysis***

As an alternative to direct observation or mathematical modeling, an application may be submitted to the Shasta County Director of Environmental Health for individual evaluations utilizing "Conditions Associated with Saturation".

a. Conditions Associated with Saturation include:
(1) Reddish brown or brown soil horizons with gray (chromas of three or less) and/or red or yellowish red mottles; or
(2) Gray soil horizons, or gray soil horizons with red, yellowish red, or brown mottles; or
(3) Dark-colored highly organic soil horizons; or
(4) Soil profiles with concentrations of soluble salts at or near the ground surface.

b. 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 or mathematical modeling as defined in A.3.C.(2)(a) and (b).

c. "Soil with Rapid or Very Rapid Permeability" means
   (1) Soil which contains thirty-five (35) percent or more of course fragments two millimeters in diameter or larger by volume with interstitial soil of sandy loam texture or coarser; or
   (2) Coarse textured soil (loamy sand or sand and as classified in a Soil Textural Classification Chart); or
   (3) Stone, cobbles, gravel and rock fragments with too little soil material to fill interstices larger than one (1) millimeter in diameter.

d. 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.

* Site evaluation procedures for determination of groundwater using "Conditions Associated with Saturation". Applications for site evaluation shall be made to the Director on approved forms. Each application must be completed in full, signed by the owner or his legally authorized representative, and be accompanied by all required exhibits and appropriate fee. Applicants shall provide at least two (2) test pits of at least two (2) feet wide and which slope toward one end at a rate no greater than 3:1 and be five (5) feet deep and located approximately seventy-five (75) feet apart and within the ½ acre dispersal area on each individual parcel or proposed parcel. A new application and fee shall be submitted for each additional set of two test pits per parcel.

For a site to be acceptable under this method for a conventional dispersal system, groundwater shall not be less than four feet below the ground surface.

Lots less than one (1) acre in size or community dispersal fields shall be evaluated using either direct observation or mathematical modeling as defined in A3c(2)(b).

The Director shall be the sole determiner of groundwater levels based on "Conditions Associated with Groundwater". This shall not preclude the applicant from conducting direct observations or mathematical monitoring as defined in A3c (2) (a) and (b).

5. **Limitations.**

a. No lot shall be created for which a seepage pit is the only feasible method of sewage disposal.

b. In subdivisions where no adequate impervious stratum lies beneath the one which may receive effluent and above the useable water aquifer, no lots shall be approved where the usable material beneath any leach line will be less than five feet. An adequate impervious stratum exists if the stratum:

(1) Confines under pressure the usable aquifer so that wells drilled in it have a higher static water level at which the driller first encounters the water; or

(2) Consists of layers of material five feet thick with particle size distribution classified as "Zone 4" in the "Soil Percolation Suitability Chart" of the North Coast Regional Water Quality Control Board document, *Soil Evaluation for On-Site Disposal*, (prepared by William T. Neikirk, Jr., dated May, 1979) and with bulk density of 1.9 or other materials demonstrated to be equivalent thereto; or

(3) Consists of material with a percolation rate slower than 120 minutes per inch when tested by the method prescribed in the *Manual of Septic Tank Practice*; or

(4) Supports a perched water table.

c. When potential is noted for inadequate treatment in the underlying or dispersal material prior to effluent reaching a usable aquifer or the surface, additional tests to prove that travel time is sufficient shall be done, or the project shall be recommended for disapproval and sewage dispersal permits will not be granted.

6. Lots created for uses which will not generate liquid wastes

a. Lots proposed and suitable for agricultural, commercial, industrial, or recreational uses that will not generate liquid wastes and do not require the regular presence of workers or employees are not subject to the dispersal area or testing requirements of the above portions of this subsection.

b. Each of these parcels shall be identified on the recorded map with this statement: "This parcel is not approved for any use that will generate liquid waste. No permit to dispose of sewage or other liquid waste generated by the uses of this property will be issued until applicable provisions of state and local law and the LAMP and County Ordinance, as amended, have been complied with."

7. Maps

a. Tentative.

All tentative maps shall show for each parcel the location, boundaries, and calculated acreage of the dispersal area(s). The test results, as determined by the procedures of A3, shall be submitted concurrently with the tentative land division application. If individual wells are proposed, the map shall show all existing and proposed well sites. Additionally, the map shall show proposed building envelopes and driveway locations. The map shall be to scale and show topography in the ½-acre dispersal area at two (2) feet contour intervals and location of the test pits, percolation tests, and piezometers.

b. Final and parcel maps.

For each parcel, the area(s) qualifying as dispersal area shall be clearly delineated and labeled on the final or parcel map. If recordation of a parcel map is waived and developable parcels are proposed, a plot plan showing equivalent information shall be attached as an exhibit to, and recorded with, the notice of approval of waiver of parcel map. The face of each map or plot plan shall be annotated: "An onsite wastewater treatment system shall be located only within the ½-acre dispersal area indicated for each parcel unless an alternative site is specifically approved by the Director." If individual wells are proposed, the map shall show all existing and proposed well sites with 100-foot setback radius clearly shown.

B. Existing Lots

Lots with septic systems installed pursuant to a valid sewage disposal system permit issued prior to November 20, 2001, may be divided without demonstrating compliance with Subsection A. but must be demonstrated to be in substantial compliance with the State OWTS Policy. Lots with septic systems installed pursuant to a valid sewage disposal system permit issued after November 20, 2001, must demonstrate compliance with the requirements of Subsection A.

SECTION 5. GROUNDWATER SEPARATION REQUIREMENTS FOR ONSITE WASTEWATER TREATMENT SYSTEMS AND OVERALL SOIL DEPTH DETERMINATIONS (OWTS Policy 9.5)

These requirements will be used for determining soil depths and groundwater levels when siting and designing Onsite Wastewater Treatment Systems (OWTS) on existing parcels to accomplish the following:

- Protect the 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.
- Provide a methodology for the evaluation of potential building sites using OWTS with regards to maintaining minimum groundwater separation requirements of the Adopted State OWTS Policy.

MINIMUM DEPTHS TO GROUNDWATER AND MINIMUM SOIL DEPTH FROM THE BOTTOM OF THE DISPERSAL SYSTEM (OWTS Policy 9.4.8)

Pursuant to **Tier one (1)** of 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:

Percolation Rate 1 to 5 MPI	Twenty (20) feet
Percolation Rate >5 to 30MPI	Eight (8) feet
Percolation Rate >30 to 120 MPI	Five (5) feet

Where MPI = Minutes per Inch (the time it takes for a column of water to drop one (1) inch in a controlled percolation test).

It is our intent, through this LAMP, to allow installation of systems in soils between 1 MPI and 120 MPI. Minimum soil depth and separation from a water table (at least 2 feet), supplemental treatment, and alternate dispersal systems that may be allowed, and at what soil percolation rate, are discussed in the specific dispersal system sections of the Technical Guidance Manual.

For OWTS with supplemental treatment and/or for some alternate dispersal systems, the required separation above may be reduced from that shown above but must not be less than two (2) feet. This reduction is allowed due to the level of pretreatment provided by the supplemental treatment and/or alternate dispersal system to replace, or enhance, treatment of effluent by soil.

Groundwater typically fluctuates seasonally depending on local geology and precipitation levels. Groundwater levels fall in response to drought and well extraction and rise in response to precipitation, flood agricultural practices, and possibly irrigation from residential development. OWTS failures due to high groundwater result in sewage effluent backing up into homes and/or surfacing on the ground creating public health hazards, and can contribute to the contamination of potable groundwater and surface water resources.

The overall soil depth and depth to the highest anticipated groundwater level must be determined for each site proposed for an OWTS.

5.A. SOIL PROFILE PITS AND GROUNDWATER MONITORING (OWTS Policy 9.1.1) (OWTS Policy 9.1.3) (OWTS Policy 9.1.5) (OWTS Policy 9.1.6)

1. Parcels created prior to 1982 SHALL have soils tests to determine suitability for wastewater dispersal. This may include, depending on the type of OWTS proposed, soil profile pits, soil borings, percolation tests, and/or may require groundwater monitoring. The soil test guidelines detailed in Sections 5.A. and 5.B.are applicable to all parcels created before 1982.
2. Parcels created since 1982 were tested to a previous soil standard and may require some additional testing depending on the type of dispersal or supplemental treatment system proposed. The soil test guidelines detailed in Sections 5.A. and 5.B. are applicable in these situations.
3. Tests performed to create new parcels (land divisions) are discussed in Section 4 of this LAMP.

The results of soil profile pits and borings will assist in determination of site soil depth and the highest anticipated depth to a water table. Soil borings, conducted by a qualified professional, and with experience in boring interpretation, must be used to determine overall soil depth and depth to groundwater where deeper depths and unsafe site/soil conditions exist.

At least one test pit shall be excavated on each lot. It shall be at least two (2) feet wide and five (5) feet deep. It shall slope towards one end at a rate no greater than 3:1. Soil borings are not limited to this five (5) foot depth. The soil profile shall be logged by a Qualified Professional and backfilled. At the request of the Director, pits/borings will be excavated for examination by SCEHD staff.

The profile or boring shall have enough information to allow a determination of whether or not groundwater is present and, if so, the highest anticipated depth to water and the overall depth of soil at the site. Soil pits/borings are to be excavated a minimum of five feet in depth. Deeper borings to determine overall soil depth and depth to groundwater would be recommended if it is believed that soils at the site meet the minimum depth beneath the bottom of the dispersal system for a conventional OWTS.

All soil profile pits 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 EHD for review.

- Within each pit/boring, from the surface to bottom of the excavation, the following is to be provided for each horizon:

  Depth of each horizon within the pit/boring;
  Color(s) within each horizon;
  Amount (by percent) and size of gravels;
  Soil texture;
  The number, size, and prominence of soil mottles, where present;
  Soil structure;
  Consistence;
  Roots by number and size;
  Pores by number and size; and,
  Boundary thickness between horizons.

The end result is to have knowledge of the useable soil depth and depth to groundwater at the site. It is not always possible to determine the depth to a seasonal water table by observing soil pits or borings. If this is the case, then it may be necessary to have a possible water table depth determined by actual measurements in groundwater monitoring wells.

GROUNDWATER MONITORING

When the highest anticipated depth to groundwater cannot be determined with the use of pits, or is in dispute, groundwater monitoring wells, for monitoring and determining the highest anticipated depth to groundwater, will be required. Examples of the need for groundwater monitoring in wells include:

a. Vegetation tolerant of, or indicative of, a high water table present on or in the vicinity of the parcel.
b. High groundwater has previously been found in the vicinity.
c. The test pits show cracked or creviced formations but no clear delineation of the top of the table.
d. Other conditions or historical data preclude accurate determination of the groundwater levels by dry weather observations.
e. The test pits indicate less than five feet of disposal material over an impervious stratum (for a proposed land division).
f. Free water from seepage is observed in the test pit.

Maps showing the locations of monitoring wells constructed at the site, and their monthly or weekly monitoring results, are to be submitted to SCEHD along with soil profile information and percolation test results. Groundwater monitoring, as with other soil tests, is to be conducted by a qualified professional.

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

Well Construction
Groundwater monitoring wells, for OWTS purposes, are typically completed as follows:

a. Soil test pits. Soil profile test pits are converted to groundwater monitoring wells by placing a perforated pipe into the pit prior to backfilling with native soil.

b. Drilled or bored hole. 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.

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

Observation
Groundwater monitoring well placement and depth must be representative of site conditions, soil percolation rate, and the type of OWTS proposed for the site/project. For example, a five (5) foot deep well is not adequate if you are proposing to install a conventional OWTS (no alternate treatment or dispersal system) if the percolation rate at the site is between 5 and 30 MPI, which requires eight (8) feet of soil beneath the bottom of a dispersal system.

Generally, at least 80% of the amount of normal rainfall normally received in an area for the period from December 1st to April 30th must be received for monitoring to be accepted by SCEHD. The Director may accept monitoring in years with less than the required amount of rainfall as long as the results appear, to the Director, to represent the highest groundwater depth for the site.

A. Direct Observation - Measurements shall be taken at the times and intervals specified by the Director in response to local conditions. Except as the Director may otherwise allow, measurements (excluding land within the A.C.I.D.) shall be taken at monthly/weekly intervals from January 1 to April 30. Land requiring groundwater monitoring caused by A.C.I.D., or other areas under irrigation, shall have monthly/weekly measurements beginning May 1 and ending August 31.

   At least one observation well shall be included within each proposed dispersal area suspected of having groundwater below the ground surface where that groundwater depth cannot be determined by observation of a soil pit. Groundwater ideally would not be less than that specific depth required for the type of system proposed. Fill, engineered for soil dispersal of effluent, may be placed to provide the necessary soil depth and separation from a seasonal water table (see technical guidance documents) where at least one foot of native soil is present.

   If these monthly depth measurements are within one foot of the depth required for the specific type of system proposed, weekly observations shall be recorded throughout the remainder of the wet weather or irrigation season to better define the seasonal water table.

B. Mathematical Modeling – This approval is to be based on the results of calculations that demonstrate that the site meets the conditions required for the type of system proposed. Calculations shall be provided by a qualified professional knowledgeable in groundwater hydrology and be based on using a 10-year rainfall return interval for the most critical situations. It is recommended that this method be discussed with the qualified professional prior to the monitoring season to determine actual well placement, depth, construction, tracking of precipitation amounts, and frequency of measurements as these may differ from the minimum requirements for groundwater depth monitoring during a "normal" rainfall year.

Well Depth

Wells should be constructed at a depth of at least five feet, to a restrictive layer, or at depths deemed necessary for the type of system proposed at a site. In no case is a well to be constructed through a restrictive layer such as hardpan, bedrock, impervious clay stratum, or similar layer. A log/profile of soil strata encountered during construction is to be submitted with the monitoring results.

The number, placement, and depth of wells for mathematical modeling should be discussed with a qualified professional prior to well construction as should the frequency of readings.

There have been years that there has not been the minimum 80% of rainfall for groundwater monitoring to be accepted by SCEHD. And in other years, the reverse has been observed with monitoring wells failing when above average rainfall is received. SCEHD is exploring other options for monitoring to determine depth to groundwater.

Soil Analysis of Conditions Associated with Saturation

As an alternative to direct observation or mathematical modeling, an application may be submitted to the Director to evaluate individual sites where conditions associated with saturation exist.

(a) Conditions associated with saturation include:
   1. Reddish brown or brown soil horizons with gray (chromas of three or less) and/or red or yellowish red mottles; or
   2. Gray soil horizons, or gray soil horizons with red, yellowish red, or brown mottles; or
   3. Dark-colored highly organic soil horizons; or
   4. Soil profiles with concentrations of soluble salts at or near the ground surface.

(b) If conditions associated with saturation do not occur in "soils with rapid or very rapid permeability," saprolite or fractured bedrock, soils predictions of the highest level of the water table shall be based on direct observation or mathematical modeling.

(c) "Soil with rapid or very rapid permeability" means
   1. Soil which contains thirty-five (35) percent or more of course fragments two (2) millimeters in diameter or larger by volume with interstitial soil of sandy loam texture or coarser, as defined in the Soil Textural Classification Chart; or
   2. Coarse textured soil (loamy sand or sand as defined in the Soil Textural Classification Chart; or,
   3. Stone, cobbles, gravel, and rock fragments with too little soil material to fill interstices larger than one (1) millimeter in diameter.

(d) Saprolite means weather 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.

Site evaluation procedures for determination of groundwater using "Conditions associated with Saturations"

Applications for site evaluation shall be made to the Director on approved forms. Each application must be completed in full, signed by the owner or his legally authorized representative, and be accompanied by all required exhibits and appropriate fee. Applicants shall provide at least two (2) test pits dimensions at least two (2) feet wide and which slope toward one end at a rate of no greater than 3 : 1 and be five (5) feet deep and located approximately seventy-five (75) feet apart and within the ½-acre dispersal area of a proposed parcel or an existing parcel. A new application and fee shall be submitted for each additional set of two test pits per parcel.

The Director shall be the sole determiner of groundwater levels based on "conditions associated with saturation". Evaluation of pits under this procedure must show conclusive evidence of the highest groundwater elevation. This shall not preclude the applicant from conducting direct observations or mathematical modeling.

SECTION 5. B. PERCOLATION TEST PROCEDURE (OWTS Policy 9.1.1) (OWTS Policy 9.1.3) (OWTS Policy 9.1.5) (OWTS Policy 9.1.6) (OWTS Policy 9.5)

This procedure establishes clear direction and methodology for percolation testing in Shasta County. The objectives are to determine the area necessary to properly treat and disperse sewage underground; to size the OWTS with adequate infiltration surface area based on expected hydraulic conductivity of the soil and the loading rate; and to provide for a system intended to allow for a long-term expectation of satisfactory performance.

All percolation testing for dispersal systems shall be conducted through the use of these percolation test procedures. The tests shall be performed by or be under the supervision, of a qualified professional. Any deviation shall be allowed only after receiving written approval by the Director.

PERCOLATION TEST HOLES PROCEDURES

Number of Percolation Holes

1. A minimum of three (3) percolation tests are required when percolation rates are 60 minutes per inch (MPI) or less. Four (4) tests are required when percolation rates exceed 60 minutes per inch.
2. Additional tests may be required on a site specific basis for reasons that include the following:
    a) Unacceptable or failed tests
    b) Areas of the dispersal field requiring defined limits for exclusion
    c) The dispersal field is located out of a concentrated area
    d) Soil conditions are variable or inconsistent
    e) To verify suitable soil permeability beneath the chosen leach field depth

Depth of Percolation Test Holes

1. Percolation test-hole depth shall be representative of the proposed dispersal system trench bottom depth or twelve (12) inches for systems such as an at-grade or drip dispersal system.
2. For each lot of proposed land divisions (see LAMP Section 4), two to three tests are to be conducted at a depth of 36 inches and the remainder at a depth of 12 inches.
3. Conditions which may require percolation testing deeper than dispersal depth include:
    a) Consolidated rock or suspected impervious soil layers beneath the site;
    b) Slopes exceeding 30 %;
    c) 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 ½-acre 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 wastewater treatment system or ½-acre sewage dispersal area (land divisions) with equal consideration of primary and reserve dispersal systems.

Identification of Percolation Test Holes

1. When specifically requested, locations are to be staked and flagged so the test-hole locations can be located.
2. They are to be identified as to location on the site plan with:
    a) A test hole number or letter;
    b) Depth of the test hole;
    c) Proposed lot/parcel number or letter if associated with a subdivision or other land use project requiring soil testing.

Construction of Percolation Test Holes

1. Diameter of percolation test holes shall be a minimum of six (6) inches.
2. If a shallow backhoe excavation is used, a percolation test hole at 12 – 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).

Preparation of the percolation test holes

1. 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.
2. Remove as much loose material as possible from the hole.
3. Add two (2) inches of clean pea gravel to protect the bottom from scouring.

Presoaking the percolation test holes

Procedure

1. Carefully fill the test hole with a minimum of 12 – 14 inches of clear water over the gravel or to the ground surface in shallower test holes.
2. 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 24 hours after water was first added to the hole.

Saturation and swelling

1. Saturation means that the void spaces between soil particles are full of water. This can be accomplished in a short period of time.
2. Swelling is caused by the intrusion of water into the individual soil particles. This is a slow process, especially in clay-type soil, and is the reason for requiring a prolonged soaking.

To prevent sloughing of the sidewall in unstable soils, the following options may be employed:

a. Hardware cloth such as a 1/8 inch grid;
b. Perforated pipe or other rigid liner;
c. Gravel pack with either of the above (NOTE: a correction factor is necessary if a gravel pack is used. See sample correction factors for common scenarios following or show all calculations with test results.)

DETERMINATION OF PERCOLATON RATES

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. Testing shall proceed based on the conditions outlined in following cases.

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

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

Case 2 - No water remains 24 hours after the presoak period was initiated.

1. Begin the test 24 hours after presoak was initiated.
2. Fill the hole with six inches of water over the gravel. If, after the first two fillings, the water column seeps away in less than 30 minutes go to **Case 3.** If water remains after 30 minutes complete the test by adjusting the water depth to 6 inches over the gravel and record the drop at the end of every 30 minute period.
3. Including the first two readings above, continue the readings and refilling every 30 minute interval for four hours.
4. The last water level drop is used to calculate the percolation rate.

Case 3 - No water remains in the hole after the first two 30 minute periods.

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

NOTE: In all three of these cases, readings shall be taken from a fixed reference point and shall be accurate to 1/16 of an inch.

CALCULATIONS AND MEASUREMENTS

Calculation Example

The percolation rate is reported in minutes per inch. For example, a 30 minute time interval with a ¾ inch fall would be as follows:

30 minutes divided by ¾ inch equals 40 minutes per inch (MPI).

In the example of a 10 minute interval with a 2 inch drop, the calculation is as follows:

10 minutes divided by 2 inch equals 5 minutes per inch (MPI).

Measurement Principles

1. The time interval for readings are to reflect the actual times and are to be maintained as near as possible to the intervals outlined for the test (10 or 30 minutes).
2. Measurements to the nearest $1/16^{th}$ inch should be adjusted to the slowest rate, e.g., a reading observed between 3/8 inch and 5/16 inch (80 MPI and 96 MPI) would be reported as the slower of the two, or 96 MPI.

Special Considerations

Percolation rate measurements are to be made from a fixed reference point and shall be from a platform that is a stable and represents the center of the test hole. Percometer devices are encouraged and are required when conducting tests greater than sixty (60) inches below the ground surface.

Common correction factors for percolation test results when gravel pack is used are as follows:

Pipe Diameter	Hole Diameter	Adjustment Factor (AF)
4"	6"	1.57
4"	8"	1.95
4"	10"	2.20
4"	12"	2.37

With the adjusted percolation rate equal to MPI x AF

Calculation formula for correction factors above is as follows: (TT equals Pi)

- X-section area of test hole, $A_H = .25TT\ D_H^2$
- X-section area of pipe, $A_P = .25\ TT\ D_P^2$
- X-section area of gravel pack, $A_G = A_H - A_P$
- Drainable voids in gravel pack = $n\ (A_G)$ (Typical value for n = 0.35) **
- Total voids = $A_P + n\ (A_G) = A_P + n\ (A_H - A_P)$
- Adjustment Factor, AF:

$$AF = \frac{A_H}{A_P + n\ (A_H - A_P)}$$

$$AF = \frac{.25TT\ D_H^2}{.25\ TT\ D_P^2 + n\ (.25TTD_H^2 - .25\ TT\ D_P^2)}$$

$$AF = \frac{D_H^2}{D_{P2} + n\ (D_{H2} - D_{P2})}$$

**or run test for void ratio (n) in actual rock used

Results Reporting

1. All test data and other required information is to be submitted to the SCEHD on forms and format acceptable to the SCEHD with appended data or information as needed.

2. Reports shall be signed with an original signature from the qualified professional who either performed or supervised the testing.

3. 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.

4. 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.

APPENDICES INDEX

A. DEFINITIONS

"303 (d) List" means the same as Impaired Water Bodies.

"State OWTS Policy" or Policy means the OWTS Policy adopted by the State Water Resources Control Board requiring the preparation of a Local Agency Management Program (LAMP).

"Alternative treatment systems" include intermittent and recirculating sand filters, proprietary treatment units, and other alternative treatment systems approved by the Director. Generally referred to as "supplemental" treatment systems in this LAMP.

"Alternate dispersal systems" include shallow trench pressure distribution, mound, At-grade, drip dispersal, and other alternative dispersal systems approved by the Director. Some alternate dispersal systems can be used without the need for a supplemental treatment system.

"At-grade system" means an OWTS dispersal system with a discharge point located at the preconstruction grade (ground surface elevation) with qualifying fill material used to cover the dispersal system. The discharge point of an At-grade system is, therefore, always subsurface.

"Average annual rainfall" Means the average annual amount of precipitation for a location over a year as measured by the nearest National Weather Service station for the preceding three decades. For example, the data set used to make a determination in 2015 would use the data from 1984 to 2013.

"Bedrock" means the rock, usually solid, that underlies soil or other unconsolidated, surficial material.

"Biomat" is a bacterial slime layer which forms in soil at the bottom of leach lines and other dispersal systems. It is responsible for much of the treatment and reduction of biological solids and bacteria present in onsite wastewater treatment system effluent (from either a septic tank or supplemental treatment system) discharged to the soil.

"Building Sewer" means that part of the horizontal piping of a drainage system that extends from the end of the building drain and that receives the sewage discharge of the building drain and conveys it to the OWTS.

"CEDEN" means California Environmental Data Exchange Network and information about it is available at the State Water Boards website or http://www.ceden.org/index.shtml .

"Cesspool" means an excavation in the ground receiving domestic wastewater, designed to retain the organic matter and solids, while allowing the liquids to seep into the soil. Cesspools have not been approved for use in Shasta County. Cesspools do not have septic tanks and are not authorized under this Policy. Any cesspool found in use will be required to be destroyed and replaced by a properly designed and constructed OWTS.

"Chroma" is a measure of color purity in the Munsell color system.

"Clay" means a fine-grained natural rock or soil particle that combines one or more clay minerals with traces of metal oxides and organic matter. This term also refers to a soil texture. Particle size would not exceed 0.002 nm.

"Cobbles" means rock fragments 76 mm or larger using the USDA soil classification system.

"Community disposal fields" are fields that serve more than two (2) dwelling units.

"Conventional onsite water treatment system" means an OWTS constructed in soil meeting Tier 1 specifications. A conventional OWTS consists of a septic tank and a series of subsurface dispersal trenches for subsurface dispersal of effluent into the soil. A conventional OWTS may utilize gravity flow or a pump system to convey effluent from the septic tank to the drain field.

"Curtain drain or French drain" is a gravel trench that is excavated down to a relatively impermeable soil layer and installed to intercept, collect, and remove shallow subsurface groundwater as it flows above the impermeable layer.

"Cut or embankment" means 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 supported 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" means the Director of Environmental Health or his/her designee in the Shasta County Environmental Health Division of the Department of Resource Management.

"Dispersal system" means a series of trenches, beds, subsurface drip lines, or other approved method for subsurface infiltration and absorption of wastewater effluent, including all component parts such as piping, valves, filter material, chambers, dosing pumps, siphons, and other appurtenances.

"Domestic wastewater" means wastewater with a measured strength less than high-strength wastewater and is the type of wastewater normally discharged from, or similar to, that discharged from plumbing fixtures, appliances, and other household devices including, but not limited to toilets, bathtubs, showers, laundry facilities, dishwashing facilities, and garbage disposals. Domestic wastewater may include wastewater from commercial buildings, such as office buildings, retail stores, and some restaurants, or from industrial facilities where the domestic wastewater is segregated from the industrial wastewater. Domestic wastewater does not include industrial wastewater or wastewater consisting of a significant portion of RV holding tank wastewater such as at RV dump stations.

"Domestic well" means a groundwater well that provides water for human consumption and is not regulated by the California Department of Public Health.

"Drainage way" for purposes of this Policy means an intermittent, seasonal, or perennial waterway which continues to flow at least five (5) days after a storm and as measured from the top of the bank or other physically evident high water line.

"Drain field" means a system of rock-filled trenches or beds that distribute treated effluent for subsurface dispersal into the soil. A drain field is also known as a "leach field" or "soil absorption system".

"Dredger tailings" for purposes of this Policy means the accumulated gravels and sands separated from soil primarily in gold dredging operations.

"Dump Station" means a facility intended to receive the discharge of wastewater from a holding tank installed on a recreational vehicle. A dump station does not include a full hook-up sewer connection similar to those used at a recreational vehicle park.

"Earthen material" means a substance composed of the earth's crust (i.e., soil and rock).

"EDF" or Electronic Deliverable Format means the data standard adopted by the State Water Board for submittal of groundwater quality monitoring data to the State Water Board's internet-accessible database system GEOTRACKER (http://geotracker.waterboards.ca.gov).

"Effluent" means sewage, water, or other liquid, partially or completely treated or in its natural state, flowing out of a septic tank, aerobic treatment unit, dispersal system, or other OWTS component.

"Engineered fill" means a designed placement of specified imported soil over existing native soils on an existing parcel with inadequate soil depth to meet the minimum two (2) to three (3) feet of soil depth required beneath a dispersal system, and a minimum of two (2) to three (3) feet of separation between the bottom of a dispersal system and a water table.

"Ephemeral drainage" for purposes of this LAMP, means a stream, or other drainage such as a roadside ditch, that flows for less than five 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. Setback measurements are made from the edge of the channel.

"Existing OWTS" means an OWTS in which a valid construction permit has been issued or that was constructed and operated prior to the adoption of standards developed in response to the State OWTS Policy.

"Existing Parcel" means any vacant or developed parcel that was in existence prior to the adoption of standards developed in response to the State OWTS Policy.

"Failure" means 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.

"GeoTracker" is the SWRCB data management system for managing sites that impact groundwater, especially those that require groundwater cleanup.

"Gleying" is the process of waterlogging and reduction in soils. Gleyed soils are soils developed under conditions of poor drainage and can generally be found as surface water and ground water gleys.

"Groundwater" means water that is below the land surface that is at or above atmospheric pressure.

"High-strength wastewater" means wastewater having a 30-day average concentration of biochemical oxygen demand (BOD) greater than 300 milligrams-per-liter (mg/l) or of a total suspended solids (TSS) greater than 330 mg/l or a fats, oil, and grease (FOG) greater than 100 mg/l prior to the septic tank or other OWTS treatment component.

"IAPMO" means the International Association of Plumbing and Mechanical Officials.

"Impaired water bodies" means those surface water bodies or segments thereof that are identified on a list approved first by the State Water Board and then approved by the US EPA pursuant to Section 303(d) of the federal Clean Water Act.

"Intermittent sand filter" means a packed-bed filter of medium-grained sand used to treat septic tank effluent to an advanced level. Wastewater is dosed to the surface of the sand through a pressure-distribution network and allowed to percolate through the sand where BOD is reduced and suspended solids are removed; treatment is accomplished by physical filtration as well as microbial growth on the surface of the sand grains. After a single pass, the effluent is collected in an underdrain system for further processing or dispersal.

"Intermittent Stream" is a stream or other drainage that flows for more than 5 days per year but does not continue to flow the entire year.

"Irrigation ditch or canal" means a man-made lined or unlined ditch intended to supply dry land with water and must meet the setbacks specified for ephemeral, intermittent, or seasonal drainage ways except as allowed otherwise.

"Linear Loading Rate" is defined as the amount of effluent, in gallons, applied per day, per lineal foot of the dispersal system. The "amount" is the total of all parallel dispersal systems along a contour. The design linear loading rate is a function of effluent movement rate away from the dispersal system and the direction of flow away from the dispersal system.

"Local agency" for purposes of this Policy means the Environmental Health Division of the Shasta County Department of Resource Management.

"Local Agency Management Program (LAMP) means this document to be used for siting, evaluation, design, operation, and management of onsite wastewater systems within Shasta County.

"Major repair" means either (1) for a dispersal system, repairs required for an OWTS dispersal system due to surfacing wastewater effluent from the dispersal field and/or wastewater backed up into plumbing fixtures because the dispersal system is not able to percolate the design flow of wastewater associated with the structure served, or (2) for a septic tank, repairs required to the tank for a compartment baffle failure or tank structural integrity failure such that either wastewater is exfiltrating or groundwater is infiltrating. A permit to repair this failure is required from SCEHD and all systems, after repair, must be in compliance with this LAMP.

"Minor repair" means a failure of a component other than a septic tank, treatment system, or dispersal system such as a distribution box or broken piping connection. A permit to repair this failure is required from SCEHD.

"Mottling" means a soil condition that results from oxidizing or reducing minerals due to soil moisture changes from saturated to unsaturated over time. Mottling is characterized by spots or blotches of different colors or shades of color (grays and reds) interspersed within the dominant color as described by the USDA soil classification system. The soil condition can be indicative of historic seasonal high groundwater level, but the lack of this condition may not demonstrate the absence of groundwater.

"Mound system" means an aboveground dispersal system (covered sand bed with effluent leach field elevated above original ground surface inside the mound) used to enhance soil treatment, dispersal, and absorption of effluent from an OWTS treatment unit such as a septic tank. Mound systems are considered subsurface discharge.

"New OWTS" means an OWTS permitted after the approval date of this LAMP.

"Non-conventional OWTS" means a system that is not a conventional septic tank/leach field system, and uses an alternative treatment and/or dispersal system to mitigate shallow soil depth and/or depth to groundwater.

"NSF" means NSF International (a. k. a. National Sanitation Foundation), a not for profit, non-governmental organization that develops health and safety standards and performance product certification.

"Onsite wastewater treatment system(s) (OWTS)" means individual treatment and dispersal systems, community treatment and dispersal systems, and alternative treatment and dispersal systems that collect and treat wastewater for subsurface dispersal. The short form of the term may be singular or plural. OWTS do not include "gray water" systems pursuant to Health and Safety Code section 17922.12.

"Ped" means an individual natural soil aggregate.

"Perennial Waterway" is 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.

"Percolation test" means a method of testing the water absorption ability of the soil. The test is conducted with clean water and test results are used to establish a percolation rate and facilitate the dispersal system sizing and design.

"Permeable soil" means soil that has a percolation rate of 120 minutes per inch or faster or having a clay content of less than 60 percent, and shall not contain solid rock formations or those that contain continuous channels, cracks, or fractures.

"Permit" means a document issued by SCEHD that allows the installation and use of an OWTS.

"Permitting authority" for purposes of this Policy means the Environmental Health Division of the Shasta County Department of Resource Management.

"Person" means any individual, firm, association, organization, partnership, business trust, corporation, company, State agency or Department, or unit of local government who is, or that is subject to this Policy.

"Pit-privy" (a. k. a. outhouse or pit-toilet) means self-contained waterless toilet used for disposal of non-water carried human waste; consists of a shelter built above a pit in the ground into which human waste falls. Unlined pits are not allowed by this LAMP.

"Policy or State OWTS Policy" means the Water Quality Control Policy adopted by the State Water Resources Control for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems on June 19, 2012, requiring the preparation of a Local Agency Management Program (LAMP).

"Pollutant" means any substance that alters the waters of the State to a degree that it may potentially affect the beneficial uses of water, as listed in a Basin Plan.

"Precipitation" means measureable amounts of rain, snow, hail, and other similar natural phenomenon.

"Projected flows" means wastewater flows into the OWTS determined in accordance with any applicable methods for determining average daily flow as approved by the Director, in accordance with this LAMP.

"Public water system" is a water system regulated by the California Department of Public Health or a local Primacy agency pursuant to Chapter 12, Part 4, California Safe Drinking Water Act, Section 116275 (h) of the California Health and Safety Code.

"Public water well" is a ground water well serving a public water system. A spring which is not subject to the California Surface Water Treatment Rule (SWTR), CCR, Title22, Sections 64650 through 64666, is to be considered a public well.

"Qualified Professional" means an individual licensed or certified by a State of California agency to design OWTS and practice as professionals for other associated reports, as allowed under their 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. 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 installers, and conduct necessary inspections. No other person, license, or registration/certification will be approved as a Qualified Professional. (OWTS Policy 9.1.7)

"Regional Water Quality Control Board (RWQCB)" for purposes of this Policy, means the Region 5 board. Any reference to the RWQCB in this document also refers to an action of its Executive Officer.

"Replacement OWTS" means an OWTS that has its treatment capacity expanded, or its dispersal system replaced or otherwise added onto, after the effective date of this Policy. An OWTS may be replaced for a variety of reasons including failure, home additions increasing the number of occupants/water use, relocation to accommodate home additions, home sales, and other reasons.

"Sand" means a soil particle; this term also refers to a soil texture. As a soil particle, sand consists of individual rock or mineral particles in soil having diameters ranging from 0.05 to 2.0 millimeters.

"saprolite" means soft, thoroughly decomposed and porous rock, often rich in clay, formed by the in-place chemical weathering of igneous, metamorphic, or sedimentary rocks.

"SCEHD" means the Environmental Health Division of the Shasta County Department of Resource Management.

"Seepage pits" means a vertical excavation constructed to receive effluent from a septic tank. As the adopted State OWTS Policy requires a minimum of ten (10) feet of adequate soil and separation between the bottom of the pit and highest anticipated groundwater level and increased horizontal separation distances, it is not anticipated that permits will be issued for their construction and use in Shasta County.

"Septage" is the term used for the partially treated and settled solid and liquid material removed from the septic tank (and some treatment systems) by septic tank pumper trucks. Septage includes settled solids, fats oils grease and other floating materials, and liquid.

"Septic tank" means 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" means a person capable of operating, monitoring, and maintaining an OWTS in accordance with this Policy.

"Silt" means a soil particle; this term also refers to a soil texture. As a soil particle, silt consists of individual rock particles in soil having diameters ranging between 0.05 and 0.002 mm.

"Site" means the location of the OWTS and, where applicable, a reserve dispersal area capable of disposing of 100 percent of the design flow from all sources the OWTS is intended to serve.

"Site plan" means a site plot plan showing, at a minimum, all existing topographic features, the locations of all required soil tests, and all proposed site grading, structures and other existing/planned improvements.

"Site evaluation" means an assessment of the characteristics of the site and onsite soils sufficient to determine suitability for an OWTS to meet the requirements of this Policy.

"Slope" means 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" means the naturally occurring body of porous mineral and organic materials on and at 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 purposes of this Policy, soil shall contain earthen material of particles smaller than 0.08 inches (2mm) in size. For the purposes of this LAMP, soil is the ultimate receiver of wastewater and the most important part of an OWTS. Therefore, in addition to the depth to groundwater, the proper evaluation of soil structure, permeability, and overall useable soil depth is critical in the proper choice and design of an OWTS for any particular site.

"Soil profile" is a natural sequence of layers, or horizons, in the soil as described in a suitable manner acceptable to SCEHD.

"Soil structure" means the arrangement of primary soil particles into compound particles, peds, or clusters that are separated by natural planes of weakness from adjoining aggregates.

"Soil texture" means the soil class that describes the relative amount of sand, silt, and clay and combinations thereof as defined by the classes of the soil textural triangle developed by the USDA.

"State Water Board" means the State Water Resources Control Board.

"Storm" for purposes of this policy means the receipt of measureable precipitation at the nearest measuring/reporting station.

"Substandard system" means any existing OWTS that does not conform to the system sizing, setbacks, soil depth, or groundwater separation requirements of this Policy.

"Supplemental Treatment" means any OWTS or component of an OWTS, except for a septic tank or dosing tank, that performs additional wastewater treatment so that the effluent meets a predetermined performance requirement prior to discharge of the effluent into the dispersal field. Also known as an alternative OWTS. Some supplemental treatment units are passive and can be placed directly onto a leach bed for direct dispersal into the soil.

"SWAMP" means Surface Water Ambient Monitoring Program and more information is available at http://www.waterboards.ca.gov/water_issues/programs/swamp/ .

"TMDL" is the acronym for "total maximum daily load". Section 303(d)(1) of the Clean Water Act requires each state to establish a TMDL for each impaired water body to address the pollutant(s) causing the impairment. In California, TMDL's are usually adopted as Basin Plan amendments and contain implementation plans detailing how water quality standards will be attained.

"USDA" means the U.S. Department of Agriculture.

"Usable leaching material" for land division purposes has both the following characteristics:

a. Percolation rates greater than five (5) and less than sixty (60) minutes per inch when tests are conducted by the method specified in the Manual of Septic Tank Practice, U. S. Department of Health and Human Services or other similar method specified in this LAMP.
b. Depth to a seasonal high water table, as determined by the procedures specified in this LAMP, shall be at least four (4) feet for lots of one or more acres and at least eight (8) feet for lots of less than one acre or community dispersal fields.

"Vulnerable surface water" means surface water vulnerable to biological and chemical contamination from an OWTS.

"Waste Discharge Permit" or "WDR" means an operation and discharge permit issued for the discharge of waste (including septic system effluent) pursuant to Section 13260 of the California Water Code.

B.1. APPLICATION RATE FOR RESIDENTIAL DISPERSAL SYSTEM SIZING CHART: The lineal feet of dispersal system required for a residence at a specific percolation rate has been calculated based on the number of bedrooms in the residence. Each bedroom equals 150 gallons in expected water use.

CHART 1 - LINEAL FEET OF LEACH LINE FOR TWO-FOOT WIDE TRENCH							
MPI	Number of Bedrooms						
	1	2	3	4	5	6	For Garbage Disposal or extra Bedroom add
1	100	100	100	115	140	170	30
2	100	100	105	140	170	205	35
3	100	100	120	160	200	240	40
4	100	100	140	185	230	280	45
5	100	100	150	200	250	300	50
6	100	110	160	215	270	320	55
7	100	115	170	225	285	340	55
8	100	120	180	240	300	360	60
9	100	130	190	250	315	380	65
10	100	135	200	265	330	400	65
11	100	140	205	275	340	410	70
12	105	140	210	280	350	420	70
13	110	145	220	290	360	435	75
14	110	150	225	300	370	445	75
15	115	155	230	305	380	460	75
16	120	160	235	310	390	470	80
17	120	160	240	320	400	480	80
18	125	160	245	325	405	485	80
19	125	165	250	330	415	495	85
20	130	170	255	340	420	505	85
21	130	170	260	345	430	515	85
22	130	175	265	350	440	525	90
23	135	180	270	355	445	535	90
24	135	180	270	365	455	545	90
25	140	185	280	370	460	555	90
26	140	190	280	375	470	565	95
27	145	190	290	380	480	575	95

CHART 1 - LINEAL FEET OF LEACH LINE FOR TWO-FOOT WIDE TRENCH							
MPI	Number of Bedrooms						
	1	2	3	4	5	6	For Garbage Disposal or extra Bedroom add
28	145	195	290	390	485	580	100
29	150	200	295	395	495	590	100
30	150	200	300	400	500	600	100
31	155	205	305	405	505	610	100
32	155	205	310	410	515	620	105
33	155	210	315	415	520	625	105
34	160	210	315	420	525	630	105
35	160	215	320	430	535	640	110
36	165	215	325	435	540	650	110
37	165	220	330	440	545	655	110
38	170	220	335	445	555	665	110
39	170	225	335	450	560	675	115
40	170	225	340	455	565	680	115
41	175	230	345	460	575	690	115
42	175	235	350	465	580	695	115
43	180	235	355	470	585	705	120
44	180	240	355	475	600	715	120
45	180	240	360	480	600	720	120
46	185	245	365	485	605	725	120
47	185	245	365	485	610	730	120
48	185	245	370	490	615	735	120
49	185	250	370	495	615	740	125
50	190	250	375	495	620	745	125
51	190	250	375	500	625	750	125
52	190	250	380	505	630	755	125
53	190	255	380	505	635	760	125
54	195	255	385	510	635	765	130

CHART 1 - LINEAL FEET OF LEACH LINE FOR TWO-FOOT WIDE TRENCH							
MPI	Number of Bedrooms						
	1	2	3	4	5	6	For Garbage Disposal or extra Bedroom add
55	195	255	385	515	640	770	130
56	195	260	385	515	645	775	130
57	195	260	390	520	650	780	130
58	200	260	390	520	655	785	130
59	200	265	395	525	655	790	135
60	200	265	395	530	660	795	135
61	200	265	400	535	665	800	135
62	205	270	405	540	675	810	135
63	210	275	410	545	680	815	135
64	210	275	415	550	685	825	140
65	210	280	415	555	690	830	140
66	210	280	420	560	700	840	140
67	215	285	425	565	705	850	140
68	215	285	430	570	715	855	145
69	220	290	435	575	720	865	145
70	220	290	435	580	725	870	145
71	220	295	440	585	730	880	145
72	220	295	445	590	740	890	150
73	225	300	450	595	745	895	150
74	225	300	450	600	750	900	150
75	230	305	455	610	760	910	155
76	230	305	460	615	765	920	155
77	235	310	465	620	770	925	155
78	235	315	470	625	780	935	156
79	235	315	470	630	785	945	157
80	240	315	475	635	790	950	160
81	240	320	480	640	800	960	160

CHART 1 – LINEAL FEET OF LEACH LINE FOR TWO-FOOT WIDE TRENCH

MPI	Number of Bedrooms						
	1	2	3	4	5	6	For Garbage Disposal or extra Bedroom add
82	245	325	485	645	805	965	160
83	245	325	490	650	810	975	165
84	250	330	490	655	820	985	165
85	250	330	495	660	825	990	165
86	250	335	500	665	830	1000	165
87	250	335	505	670	840	1005	170
88	255	340	510	675	845	1015	170
89	255	340	510	680	850	1025	170
90	260	345	515	690	860	1030	170
91	260	345	520	695	865	1040	175
92	265	350	525	700	870	1045	175
93	265	350	530	705	880	1055	175
94	265	355	530	710	885	1065	180
95	265	355	535	715	890	1070	180
96	270	360	540	720	900	1080	180
97	270	360	545	725	905	1085	180
98	275	365	545	730	910	1095	180
99	280	370	550	735	920	1105	185
100	280	370	555	740	925	1110	185
101	280	375	560	745	930	1120	185
102	280	375	565	750	940	1130	190
103	285	380	570	755	945	1135	190
104	285	380	570	760	950	1140	190
105	290	385	570	770	960	1150	190
106	290	385	580	775	965	1160	195
107	295	390	585	780	970	1165	195
108	295	390	590	785	980	1175	195

CHART 1 - LINEAL FEET OF LEACH LINE FOR TWO-FOOT WIDE TRENCH

MPI	Number of Bedrooms						
	1	2	3	4	5	6	For Garbage Disposal or extra Bedroom add
109	295	395	590	790	985	1185	195
110	295	395	595	795	990	1190	200
111	300	400	600	800	1000	1200	200
112	300	400	605	805	1005	1205	200
113	305	405	605	810	1010	1215	200
114	310	410	610	815	1020	1225	204
115	310	410	615	820	1025	1230	205
116	310	415	620	825	1030	1240	205
117	310	415	625	830	1040	1250	210
118	315	420	630	835	1045	1255	210
119	315	420	630	840	1050	1260	210
120	320	425	635	850	1060	1270	210

B.2. APPLICATION RATE CHART FOR NON-RESIDENTIAL DISPERSAL SYSTEM SIZING: This chart is to be used to convert the results of percolation tests to a loading rate for use in sizing dispersal systems for other than residential uses. Loading rates are given as gallons per square foot of trench bottom per day.

APPLICATION RATES				
Percolation Rate MPI	Loading Rate		Percolation Rate MPI	Loading Rate
1	1.12		32	.36
2	1.07		33	.36
3	.94		34	.37
4	.8		35	.35
5	.75		36	.35
6	.70		37	.34
7	.66		38	.34
8	.625		39	.34
9	.59		40	.33
10	.56		41	.33
11	.55		42	.32
12	.54		43	.32
13	.51		44	.32
14	.50		45	.31
15	.49		46	.31
16	.48		47	.31
17	.47		48	.30
18	.46		49	.30
19	.45		50	.30
20	.44		51	.30
21	.43		52	.30
22	.42		53	.30
23	.42		54	.29
24	.41		55	.29
25	.40		56	.29
26	.40		57	.29
27	.39		58	.29
28	.39		59	.28
29	.38		60	.28
30	.375		61 – 90	0.20
31	.37		91 – 120	0.10

B.3. SEPTIC TANK AND DISPERSAL SYSTEM SETBACKS. This chart is to be used to determine appropriate setbacks for septic tanks and dispersal systems. The term septic tank, as used here, also includes sumps and supplemental treatment systems.

REQUIRED HORIZONTAL SETBACK DISTANCES

Minimum Horizontal Distance (in feet) Required Between:	**Building Sewer**	**Septic Tank**	**Dispersal Field**	**Well**
Building or Structures[1]	2	5	8	Clear
Property Lines	Clear	5	10	5
Wells	50[2]	50	100	Clear
Domestic Water Line	5[3]	5	5	Clear
Springs[4]	50	50	200	Above Flood Plain
Ephemeral Drainage[7]	50	50	50	Above Flood Plain
Intermittent and Perennial Streams[5]	50	50	100	Above Flood Plain
Lakes[6]	50	50	200	Above Flood Plain
Road Cuts or Excavations		Four times height of cut with a maximum of 50 feet		Clear
Dispersal Field		5	10	100
Distribution Box		5		100

FOOTNOTES:

1. Includes mobile homes, porches and steps, whether covered or uncovered, breezeways, roofed porte-cocheres, roofed patios, carports, covered walks, covered driveways and other structures or appurtenances.

2. All non-metallic drainage piping shall clear domestic water supply wells at least 50 feet. This distance may be reduced to not less than 25 feet when approved piping is installed. Where special hazards are involved, the distance required shall be increased as necessary pursuant to the Director of Environmental Health.

3. Water pipes and sewer pipes shall not be located in the same trench. The minimum separation shall be ten feet.

4. These distances apply to sewage disposal systems on the same level as or lower than any spring. Sewage disposal systems shall not be closer than 200 feet at any point in relationship to a spring located on the same hillside or in the same watershed or 100 feet if downhill from the spring.

5. Includes irrigation ditches, roadside ditches, and natural and artificial drainage ways with either intermittent or continuous flows. This distance is to be measured from the 10-year flood line or top of bank or other evident high-water line or the expected 10-year flood line.

6. Includes lakes, ponds, reservoirs, and other bodies of standing water, as measured from the high-water line or spillway elevation. For lakes that are uphill from the disposal field, the setback may be reduced to 100 feet.

7. Ephemeral drainage also includes roadside ditches.

The Director may accept horizontal setbacks that vary from the required distances above. Examples would include drainage ways that were constructed as part of road construction but carry little or no water or reduced setbacks from systems that utilize supplemental treatment and/or disinfection.