

## ENHANCED TREATMENT SYSTEM REGULATIONS

Pursuant to Section 7.38.152 of the Santa Cruz County Code, enhanced treatment systems (EHTS) are types of alternative systems required for: 1) All large systems; and, 2) For new and upgraded onsite sewage disposal systems in sandy soils of the San Lorenzo River Watershed and County water supply watersheds. Use of EHTS will reduce the discharge of nitrate from onsite disposal systems, which is currently threatening water supplies in the San Lorenzo Valley and other parts of the County. EHTS may also be used to meet current standards in many other cases where difficult site constraints prevail.

### I. INTRODUCTION

Many acres of soils in Santa Cruz County are unsuitable for the installation of a standard onsite sewage disposal system (OSDS). These soils have limitations such as shallow depth to water tables or permeability rates too fast or too slow for standard disposal methods. As an example, a septic system installed in sandy soils delivers 15 times more nitrate to the San Lorenzo River than a septic system in non-sandy soils. Recently adopted Santa Cruz County rules now prohibit the installation of standard onsite sewage disposal systems where these conditions occur, due to potential for surface failure or groundwater contamination. Research indicates that sand filters and other enhanced treatment technologies can successfully provide treatment for disposal into these types of soils.

Santa Cruz County's EHTS objective is to utilize systems that will remove at least 75% of the total Nitrogen (N) from typical domestic wastewater, and reduce Biological Oxygen Demand (BOD), and Total Suspended Solids (TSS) to less than 10 mg/L. With EHTS, BOD and TSS reduction will lengthen disposal field life and allow for smaller and deeper disposal trenches if necessary. (These allowances will not be permitted for an EHT system that does not adequately treat both BOD and TSS to <10 mg/L or less.)

For large onsite sewage disposal systems in all water supply watersheds of Santa Cruz County, enhanced treatment systems are also required at the time of system installation or repair. "Large" systems are those onsite disposal systems that serve more than five (5) dwelling units, or serve other uses that generate 2,500 gallons or more per day of sewage effluent (typically commercial or institutional development).

The County of Santa Cruz Environmental Health Service (EHS) will generally assume full jurisdiction over all onsite wastewater discharges between 2,500 and 20,000 gpd (gallons per day) of flow. Where County authority and requirements may not be adequate to prevent significant degradation of water quality, or where total sewage flow exceeds 20,000 gpd, the discharge shall be referred to the State Regional Water Quality Control Board staff for review and appropriate action.

### II. DETERMINATION OF REQUIREMENTS FOR TREATMENT IN SANDY SOILS

The areas currently designated by the health officer as requiring EHTS in sandy soils due to present or potential nitrate contamination from septic effluent discharges include:

- The entire San Lorenzo River Watershed including Branciforte and Carbonera Creeks, designated Santa Cruz County water supply watersheds of San Vicente/Mill Creek, East Branch Liddell Creek, Laguna Creek, Majors Creek

Maps of soils and water supply watershed are available for viewing at the EHS office.

The Onsite Sewage Disposal Ordinance requirement for 2.5 feet (flow) trench depth without EHT is currently deemed to provide an adequate level of treatment for sandy soils outside of the areas designated above.

Permit applications for new systems or to upgrade systems to serve remodels with bedroom additions, or greater than 500 square feet of habitable space on parcels within designated water supply watersheds will be reviewed by EHS as follows:

- 1) In addition to the satisfaction of all permit application requirements, a computerized soils database will be examined for the parcel in question by EHS. If the proposed system is located in Zayante or Baywood soils as defined and mapped by the Soil Conservation Service, enhanced treatment will be required.
- 2) If soil textures (as demonstrated by detailed profiling and sample analysis by a certified soils laboratory) differ dramatically from the soil description for either Zayante or Baywood series described in the County's Soil Survey, then an EHT system may not be required.
- 3) Enhanced treatment systems will also be required on upgrade sites which do not have mapped Zayante or Baywood soils, but discharge sewage into material which percolates an average of 0-5 minutes per inch and are located in designated water supply watersheds
- 4) For small system repairs or remodels up to 500 square feet of habitable space with no bedroom addition, EHTS requirements on lots with sandy soils are currently waived, but may be required in the future. However, home owners with single family dwellings on small lots may want to install EHT systems in order to cut leachfield requirements by 50% and to allow future additions to their homes.

The Health Officer may accept sewage disposal permit applications utilizing EHT system designs for the upgrade of existing systems to allow building additions or remodels, and for the construction of new systems on lots of record in existence on November 8, 1988. Alternative systems may also be proposed to provide enhanced treatment and/or mitigate environmental impacts on parcels created after November 8, 1988, if those parcels can meet the requirements for a standard conventional system.

### III. TYPE OF EHT SYSTEMS PERMITTED

Where enhanced treatment systems are required, the following types of EHTS may be approved under specified conditions:

- A) **Intermittent and Recirculating Sand Filters** - Although sand filters may not fully meet the objective for nitrogen removal, they are a proven technology that provides substantial nitrogen reduction and meets the objectives for TSS and BOD reduction.
  1. A sand filter treatment system consists of a septic tank, dosing tank and pump, a sand filter bed, and a drainfield. The septic tank allows for anaerobic biological treatment of effluent. Following the septic tank, the filter bed of medium sand physically filters and promotes biological treatment of effluent prior to disposal in the drainfield. The filtering and biological effect of the sand bed results in the discharge of substantially higher quality effluent than effluent discharged directly from a septic tank to a drainfield.
  2. EHS has developed a sand filter checklist that contains current sand filter requirements and will standardize review for designers and EHS staff. EHS intends to uniformly adhere to these guidelines. However, as refinement of sand filter technology occurs, Santa Cruz County EHS will consider appropriate alterations and additions to the Departments standardized guidelines for specific sand filter designs.
- B) **Experimental EHT Systems** - EHT technologies that meet or surpass treatment effectiveness of sand filters may be approved in Santa Cruz County on an experimental basis provided that the following criteria are met:
  1. Experimental technologies will only be allowed for the upgrade or repair of an existing onsite sewage disposal system until satisfactory performance of the technology is demonstrated.
  2. No more than 3 of one type of system may be installed County-wide during an initial two year evaluation period. Once satisfactory monitoring results have been obtained by EHS the experimental system will obtain approved status and additional systems will be allowed.
  3. Prior to approval of an individual permit, the consultant proposing a system shall provide satisfactory evidence to Santa Cruz County EHS and State Regional Water

Quality Control Board that the experimental system or proprietary system will reliably and consistently meet overall EHT objectives for BOD, TSS, and nitrogen removal. The designer shall provide adequate documentation to show that the proposal will meet Santa Cruz County EHS requirements including the following:

- detailed design specifications and calculations;
- monitoring results from cited references;
- costs of installation, operation, and maintenance, including electricity costs;
- information on parts availability and servicing for proprietary systems;
- Jurisdictions where the proposed EHT system has been installed including types of uses served, dates in operation, and the names and phone numbers of officials approving and overseeing such systems.

C) **Proprietary Technologies** - A notable sub-category of alternative systems is the proprietary device or method. Proprietary devices or methods are those alternative systems or components thereof that are held under patent, trademark, or copyright. Before the Health Officer may issue a permit for a proprietary product, the manufacturer or representative must first certify to EHS that the device, product, or method meets the requirements of the specific EHS criteria, and is an appropriate application of the technology. In addition, EHS may require specific plan review and approval to document appropriate application of the product by the manufacturer prior to permit approval for an individual lot where the design has been prepared by a consultant who is not employed by the manufacturer.

No proprietary devices have been approved for use to date in Santa Cruz County. Proprietary devices will be considered as experimental EHTS, pursuant to the same process described in II B above. When performance standards have been attained for 3 of the same proprietary devices, EHS may then allow an unlimited number of this type of system as an approved proprietary technology.

#### **IV. CONTENTS AND PROCEDURES FOR PERMIT APPLICATION AND APPROVAL**

Procedures for obtaining an approved permit for an EHT system are subject to the same requirements as an alternative system (See County Code Sections 7.38.182 through 186). The owner or owner's agent will submit an application and fees for a sewage disposal permit specifying the type of EHTS. The design must be prepared by a qualified person such as a California Registered Environmental Health Specialist, civil engineer, geologist or soil scientist. Plot plan requirements are listed on the back of page one of the application. Depending on the type of EHTS, specific plan requirements are available. A checklist available from EHS shall be filled out for the particular EHTS proposed. No application will be accepted by EHS without the checklist thoroughly completed, and required supporting documentation provided.

Prior to approval of the permit, the owner will be required to sign an Acknowledgment of Use of Nonstandard System which includes the following information: description of system characteristics and limitations; operating requirements to ensure proper performance; restrictions on system use or property; pre-notification of routine monitoring inspections by EHS staff; and notification that the property owner will be assessed annually on the property tax bill to cover County costs. Once the installation is complete, a Notice of Nonstandard System, which reiterates the above information, will be recorded on the deed by EHS.

#### **V. MONITORING REQUIREMENTS AND OPERATIONS AND MAINTENANCE**

Due to their more technical nature, EHT systems generally require more intensive monitoring and maintenance to ensure that they function properly. In addition, particularly with the more experimental systems, water quality monitoring is needed to ensure that the system is not contaminating surface or ground water. Monitoring information is required for the overall EHT system program to evaluate the effectiveness of various designs and allow broader approval of satisfactory systems.

Use of an EHT system will require recording a Notice of Nonstandard system on the deed which will set forth the requirements for maintenance and monitoring. An annual fee will be charged on the tax bill which reimburses the County for the costs of conducting monitoring.

The amount of the fee will be based on the amount of time required for monitoring of that type of system. The amount of required monitoring and the magnitude of the annual fee will decline as the system demonstrates satisfactory performance over the first 2-4 years. Maintenance and repair will remain the responsibility of the property owner. Proprietary systems which are subject to an on-going required maintenance/service agreement with the vendor will be subject to a reduced county monitoring fee as long as the agreement with the vendor remains in force.

The following elements for maintenance and monitoring must be included in the system design, installation, and ongoing maintenance program:

- 1) An Operations and Maintenance Manual must be provided to the owner, operator, and EHS, specifying inspection and maintenance requirements for all mechanical, electrical, plumbing and other system components essential for operating and trouble shooting the EHT system, including gopher barriers, pumps, siphons, valves, etc. For sand filters, lines shall be checked for clogging of orifices and shall be cleaned once a year. The owner must comply with the provisions in the Manual.
- 2) For proprietary EHT systems, an ongoing Maintenance/Service Agreement should be maintained which will provide specified monitoring and service by qualified service personnel, preferably provided by the design company. Certain EHTs require monitoring agreements.
- 3) Each system shall include a device for measuring the volume of effluent discharged to the system over time. All inspections shall include a determination of volume of sewage discharge per unit time.
- 4) Effluent levels in all effluent disposal devices shall be measured by EHS one to three times a year, including the late winter period of high groundwater, for the first 2-4 years of operation, depending on the type of EHTS installed.
- 5) If high groundwater is a constraint on the property, the design and installation shall include monitoring wells for monitoring upgradient and downgradient groundwater quality. Downgradient monitoring wells should be located 10-25 feet from the disposal area. Parameters to be tested for in water samples shall include: fecal coliform, total nitrogen, nitrate, and ammonia. Samples shall be collected from at least 3 monitoring points at least 2 times a year, including the late winter period of high groundwater, for the first 2 years of operation for Category I systems and once a year for the first two years of operation for Category II systems. In order to establish background water quality, samples shall be collected prior to beginning use of the system
- 6) If the system is designed to provide for nitrogen reduction, or an enhanced level of treatment prior to discharge, the design and installation shall include provisions for collecting samples of effluent prior to the treatment device and at the point of discharge from the treatment device. Analysis shall include: fecal coliform, total nitrogen, nitrate, ammonia, biological oxygen demand and total settleable solids. Installation of lysimeters and sampling within the unsaturated zone below the disposal device may be required in excessive soil permeability where the design provides for enhanced treatment within the disposal device.
- 7) EHS may require additional monitoring and maintenance requirements as a condition of initial permit approval, or as part of the Notice of Nonstandard System
- 8) Monitoring will be carried out under the terms of the Notice of Nonstandard System, which is recorded on the deed.
- 9) If the results of the initial 2-4 year monitoring period are satisfactory, inspections will be reduced, and the annual fee will also be reduced accordingly

