

# Monterey County Health Department Environmental Health Bureau

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## Conventional Onsite Wastewater Treatment Systems (OWTS) Performance Evaluation Guidelines

### INTRODUCTION

The purpose of these inspections will be to determine, on an individual basis, whether existing OWTS located in Monterey County are functional and meet minimum standards of performance established by the Central Coast Regional Water Quality Control Board (RWQCB) and the Monterey County Health Department, Environmental Health Bureau (EHB). The following performance criteria are established as minimum requirements:

1. There is no surfacing effluent at any time.
2. The effluent is not discharged directly to groundwater.
3. There is always positive flow to the dispersal field from the septic tank with no backup to the tank or house plumbing during high groundwater conditions.
4. The existing septic tank must be in satisfactory condition and constructed of approved materials.

The following sets forth procedures in conducting performance evaluations, to assure consistency and thoroughness in verifying the functioning status of existing OWTS.

### INSPECTION RESPONSIBILITY

The inspections shall be carried out by individuals or employees of companies whom have either 1) completed the Inspector Certification course through National Association of Wastewater Transporters (NAWT) or California Onsite Wastewater Association (COWA) or 2) have at least 3 years of experience in liquid waste hauling and OWTS assessment. The individuals conducting the field inspection work shall be well versed in the operation and maintenance of OWTS. *As part of the forthcoming Qualified Professional registration program described in LAMP Section 5.6, Monterey County intends to develop an in-house training for testing and inspection procedures outlined in this document. Potential inspectors shall participate in the training and pass an exam to demonstrate comprehension of procedures prior to inclusion on Monterey County's Qualified Professionals list to conduct OWTS inspections.*

### BACKGROUND DATA

Prior to conducting the field performance inspection, background information pertaining to the property, structures and OWTS shall be compiled and reviewed. This should include permit information, site plan, "As Built" drawings of the septic systems or "snake and locate" results, prior sanitary survey inspection results, etc. In the event a system lacks official documentation of the dispersal field location(s), the EHB may specify that a "snake and locate" be performed by

a Qualified Professional in order to conclusively identify the configuration of the dispersal field(s).

The site plan must show the location of the septic tank and leachfield, the locations of all buildings, decks, cutbanks, creeks, wells, reserved repair area, direction and percentage of slope, or any other items which may affect the OWTS.

When a development permit application prompts the need for an OWTS Performance Evaluation, as required by Table 4-1 of the Monterey County Local Agency Management Program (LAMP) for OWTS, the reserve or future replacement area must also be identified. The evaluation must address system performance during wet weather conditions as well as dry weather conditions. This may or may not require the completion of an inspection during the wet season, depending on the site conditions and system design.

## **1. INITIAL SITE RECONNAISSANCE**

Initially, the inspector should walk the property to confirm the location of the septic tank, dispersal field, current usage and other pertinent features of the system. The septic tank and dispersal field areas should be checked for any obvious signs of existing system problems such as surfacing effluent, odors, greywater bypasses, selective fertility (i.e., lush vegetation in the leachfield area) or any other condition that may suggest an existing or impending problem. The inspector should determine if the system has dual dispersal fields and, if so, locate and check the diversion valve, (a) to see that it is functional; and (b) to determine which field is in service. All observations should be noted.

### **Special Consideration for Systems in Areas Known to be Affected by Groundwater**

The following requirement applies to systems installed in an areas considered by the EHB to have shallow groundwater conditions when the OWTS dispersal field(s) were not designed or installed to maintain a minimum setback distance of at least five feet (5') between the bottom of the dispersal field and groundwater. The following procedure may also be implemented at the discretion of the Qualified Professional to identify the cause of a failed hydraulic load test that could not be remedied on site (Performance Evaluation – step 3).

As part of the initial site reconnaissance, a boring (3-inch diameter minimum) shall be made approximately two feet (2') alongside (but not within) the dispersal field area for observation of groundwater conditions. The boring should be advanced until refusal at a restrictive layer. The purpose of this boring is to explore and evaluate the presence of shallow perched groundwater conditions that may affect or be caused by system operation. The boring is not intended to determine the depth to groundwater below trench bottom. When the boring is completed, if any groundwater is encountered the depth to groundwater from ground surface shall be measured and recorded. The boring shall then be left open for the remainder of the performance inspection so that a final groundwater depth may be taken after the water level has been allowed to stabilize for about one hour. The boring should be backfilled before leaving the site.

## 2. SEPTIC TANK INSPECTION

After the initial site reconnaissance has been conducted, the detailed inspection of the system should commence.

Personal Protective Equipment shall be worn, including:

- Safety glasses
- Overalls
- Gloves
- Work boots

First aid and other supplies, such as anti-bacterial soap, ibuprofen, insect repellent, antihistamine, hydrocortisone cream, and Xylocaine gel, should be readily available.

### Access Risers

First, locate the septic tank and determine if permanent access risers have been installed on the septic tank. If the tank is equipped with risers, check their general condition. Ideally, the risers should be properly grouted or sealed to the top of the septic tank to prevent groundwater and/or surface water intrusion. The lids of the risers should also be properly sealed to prevent odors and the entry of insects, (e.g., flies, mosquitoes, etc.). Any observed defects in the access risers should be noted. If the tank is located greater than six inches (6") below grade and lacks access risers, this information should be so noted.

If a diversion valve exists and lacks an access riser, this information shall be so noted; and the property owner shall be required to install one.

The EHB may require installation of septic tank access risers or diversion valve risers as a condition of approval for a corresponding or subsequent development permit application.

### Opening the Tank

After inspecting the access risers the septic tank lids should be carefully removed. Care must be taken if gardens and shrubs are near to prevent damage and to disturb the yard area as little as possible. Concrete lids are heavy and may be "cemented" in place by silt. A steel bar or other suitable tool may be needed to assist in opening the lids. During the tank inspection process, personnel should wear protective boots and gloves (neoprene) to guard against infection from pathogenic organisms.

The lid of the tank will be contaminated, take measures to avoid contaminating the area around the tank.

### Scum and Sludge Levels

Using a sludge and scum measuring device, i.e. Sludge Judge ®, measure the sludge and scum levels in the tank. Make notes on the percentage/level of each layer in the tank. Recommend the septic tank be pumped if the combined depth of scum and sludge is 35-40% of the tank depth.

### Liquid Level

The liquid level in the tank should be measured with respect to the outlet pipe. In a properly functioning system, the level in the tank should be even with the invert (i.e., bottom) of the outlet pipe (see **Figure 1**). If the liquid level is below the outlet pipe, the tank is leaking. If the liquid is above the pipe, the dispersal field is either flooded or obstructed. The depth of water above or below the outlet pipe should be measured and noted. If the tank does not appear to be level, note the severity of the condition.

### Structural Condition

Once the tank is open, the inspector should observe and probe the structural condition of the septic tank to check for any obvious signs of cracking or other structural defects in the tank.

For concrete tanks, a steel rod is used to probe the walls and bottom of the tank. For plastic tanks a blunt-end probe should be used; however, in general defects in plastic tanks are most likely to be exhibited through visual observation or from an abnormally low liquid level (indicating leakage). Normally, the tank will need to be pumped-out to perform this procedure. The inlet and outlet sanitary "tees" should also be inspected to assure that they are in satisfactory condition, properly positioned, and free of scum accumulation, rocks, root matter or other obstructions. Any problems should be noted and the inspector shall conduct whatever additional tests or observations necessary to verify the structural integrity of the septic tank.

### Tank Capacity

The capacity of the septic tank (in gallons) shall be determined from measurements of the width, length and depth (below outlet pipe) of the tank or referenced from the volume of wastewater pumped from the tank. A minimum septic capacity of 3 times the maximum expected daily wastewater flow rate shall be required for the existing septic tank size to be considered adequate. If this criterion is not met or there is any uncertainty regarding compliance, then the EHB may require additional tank capacity be added as a condition of approval for a corresponding or subsequent development permit application.

Inspect the outlet tee of the tank for an effluent filter. Note the condition of the effluent filter. If the filter is missing a new one shall be installed. It can be difficult to retrofit some older tanks with an outlet tee and effluent filter because of the shape/configuration of the tank. When this is the case, EHB will evaluate the requirement to incorporate an effluent filter on a case-by-case basis.

### Tank Rating

Based upon observations made during the septic tank inspection, a septic tank rating shall be assigned in accordance with the guidelines provided in **Table 1**. A description shall be provided of all repairs that are necessary to bring the tank back into acceptable condition or, when tank replacement is necessary, a description of the features of the tank that cannot be repaired. A septic tank receiving an "Unacceptable Condition" rating shall require appropriate upgrade or replacement.

### 3. HYDRAULIC LOAD TEST

#### General

The inspector should then proceed with the hydraulic load test of the septic tank and dispersal field. The test, as described here, is conducted only for standard gravity fed leachfields, and does not apply if the system utilizes a pump. A separate test to be conducted for pump systems is described in the next section. The hydraulic load test is conducted by surcharging the system with 150 gallons of water over a minimum 30-minute period. The volume of water shall be measured by installing a portable water meter between the house faucet and the hose to directly measure the volume of water surcharged to the outlet pipe. Alternatively, the flow rate from the hose could be determined with 5-gallon bucket and stop watch. Fluorescent tracer dye may be used to assist in observing dispersal field failure. An inspector provided garden hose with backflow assembly device at hose bib shall be used to administer this test. Take care to prevent contamination when connecting/disconnecting the hose to the outdoor hose bib.

If the residence has been vacant for more than a few weeks time preceding the inspection, the hydraulic load test would not provide assurance that the dispersal field is in good working order. A televised snake and locate shall be required to establish the physical condition of the dispersal field in lieu of the above-prescribed Hydraulic Load Test.

#### Test Procedures

When surcharging into the outlet side of the septic tank:

- Measure the location of the static water line in the septic tank (at the outlet side) as an initial reference point.
- Begin surcharging water to start the hydraulic load test.
- Observe any rise in the liquid level at the outlet pipe and measure the water level at the end of filling. Typically, the liquid level will rise from 0.5 to 1 inch, at which point the liquid level should stabilize for the remainder of filling; and the return to the initial level in a matter of minutes after filling is stopped.
- After the filling cycle is finished, the water level decline in the septic tank is observed until the initial level is reached; and the time to achieve this is recorded. If the initial level is not attained within 30 minutes, the test is terminated and the final water level is noted.

If a pump system is part of the dispersal field design, refer to the following section for hydraulic loading testing associated with a pump basin.

## **PUMP SYSTEMS**

For systems equipped with an effluent pump, the following inspection procedures should be followed. **Figure 2** provides a diagram of a typical pump system installation for reference.  
General

Remove the pump access cover and basin lid, taking care that no soil or other material enters the basin. Note any signs of scum or sludge buildup, indications of previous pump failure (such as scum line above the high water alarm switch), or evidence of soil or roots entering the basin. Also, inspect the float controls to see that they have free movement, and check the electrical junction box (if located in the basin or access riser) and control/breaker box for any obvious signs of corrosion. Note all proposed actions for repair. If the water level in the basin is normal (i.e., between the high and low water controls) proceed with testing of the pump systems.

### Demand (Volume-Dependent) Dosed System

#### Pump Test

Using an inspector-provided garden hose with acceptable backflow device, water may be added to the outlet side of the septic tank, or directly to the pump basin. The pump test is conducted by adding sufficient water to the basin to activate the pump "on" control, and observing the performance of the system over at least one pumping cycle. The total amount of water added should be about 150 gallons, to approximate the same hydraulic loading of the dispersal field as for gravity systems. If filling the basin directly, care should be taken to minimize turbulence and disturbance of sediment or sludge that may have collected in the basin. This can be best accomplished by directing the stream of water against the interior side of the chamber, rather than directly toward the bottom of the pump chamber.

Observe the filling of the basin, and note and measure the point at which the pump is activated. Immediately stop the filling operation and observe the pumping cycle until the pump shuts off. While the pump is discharging, examine the piping system for any leaks. Even small leaks could be a forewarning of possible breaks in the pressure line at some point in the future; and these shall be corrected. Note and measure the depth at which the pump shuts off, and calculate the volume of water between the "on" and off measurements. Compare this dose with the design dose volume specified for the system. If the dose is too high or too low, float controls should be readjusted to correct the dose. Any adjustments to the pump system should be done by a licensed and properly qualified contractor (not by the inspector). Recommence the filling operation and follow the instructions above until a total of approximately 150 gallons of water has been discharged to the dispersal field.

The pumping cycle (from "on" to "off") should be timed and the results recorded on the inspection form. Typically, if the pump is sized and operating properly, pump operation lasts 1 to 5 minutes per dose. Pump cycles lasting longer than this may indicate dispersal field clogging and/or pump deficiencies. If this is observed, it should be noted and further investigation of the pump and dispersal field should be conducted to determine the specific cause.

If during filling of the sump basin or chamber, the pump does not activate when the water reaches the high liquid level control (i.e., "on" float), discontinue the pump test. This indicates a pump failure, defective float switch or wiring problems and will require the repair service of a licensed competent contractor familiar with these types of systems. The pump system failure should be noted, communicated immediately to the resident/owner and to the EHB, so that the property owner can take prompt corrective action.

### Time-Dependent Dosing

#### Pump Test

The pump test is conducted by observing the performance of the system over at least one pumping cycle, which may require a manual override of the timer. Ensure that an adequate volume of water is added to the pump basin to allow for a complete cycle to occur. A minimum of 150 gallons shall be pumped to the dispersal field to approximate the same hydraulic loading of the dispersal field as for gravity systems. Using an inspector-provided garden hose with acceptable backflow device, the water may be added to the outlet side of the septic tank, or directly to the pump basin. If filling the basin directly, care should be taken to minimize turbulence and disturbance of sediment or sludge that may have collected in the basin. This can be best accomplished by directing the stream of water against the interior side of the chamber, rather than directly toward the bottom of the pump chamber.

Observe the filling of the basin, and note and measure the point at which the pump is activated along with any deficiencies in the pump basin or piping. The pumping cycle (from "on" to "off") should be timed and the results recorded on the inspection form. Compare this cycle with the design specified for the system and note. Any adjustments to the pump system should be done by a licensed and properly qualified contractor (not by the inspector).

If during filling of the sump basin or chamber, the pump does not activate when the water reaches the high water control (i.e., "on" float), discontinue the pump test. This indicates a pump failure, defective float switch or wiring problems and will require the repair service of a licensed, competent contractor familiar with these types of systems. The pump system failure should be noted, communicated immediately to the resident/owner and to the EHB, so that the property owner can take prompt corrective action.

### Dispersal Field Inspection

At the completion of the pump test, the dispersal field area shall be checked for signs of seepage in the same manner as done for gravity-fed systems following the hydraulic load test.

### Dispersal Field Rating

Based upon the water level readings during the test, a hydraulic performance rating shall be assigned to the system in accordance with the guidelines provided in **Table 1**. It should be emphasized that these are guidelines only, and special circumstances may be cause for modifying

the evaluation and rating of particular systems. A system receiving a "Failed" rating shall require appropriate upgrade, replacement or repair.

**TABLE 1  
SEPTIC TANK AND HYDRAULIC LOAD TEST RATING GUIDELINES**

<b>Septic Tank</b>	
<b>Condition Rating</b>	<b>Description</b>
Acceptable	Currently Functioning Properly
Unacceptable	Repairs can bring tank to Acceptable
Failed	Repair cannot bring the tank to Acceptable and must be replaced/upgraded
<b>Hydraulic Load Test of Dispersal Field</b>	
<b>Condition Rating</b>	<b>Directly to Outlet Pipe</b>
Acceptable – Currently Functioning Properly	Less than two (2) gallons of backflow into the outlet side of tank once the bladder-type device is removed
Inconclusive - More Information Required	More than two (2) gallons of backflow into the outlet side of tank once the bladder-type device is removed
Unacceptable - Failed	Continuous backflow of water into the outlet side of the septic tank once the bladder-type device is removed

#### 4. FINAL LEACHFIELD INSPECTION

At the completion of the hydraulic load test, the drainfield area and downslope areas should be checked again for indications of surfacing effluent, wetness, or odors. If any of these conditions exist as a result of the hydraulic load test, this shall be considered conclusive evidence of system failure and shall require appropriate upgrade, replacement or repair. If the field observations of wetness are not obviously the result of the hydraulic load test, further investigation may be necessary to determine if the drainfield is failing and the cause of the failure. Additional investigative work may include water quality sampling of surfaced water (for total and fecal coliform (E.coli) using quantitative analysis (most probable number, MPN), surfactants, ammonia and nitrate), dye testing, or further exploration of groundwater conditions. The cause of seepage could be related to gopher holes, site drainage or erosion problems, excessive water use or simply the age of the dispersal system.

#### **CLEAN UP**

At the completion of the OWTS inspection and testing, the inspector shall replace all access lids and clean all tools before leaving the site. All tools and equipment that come into contact with wastewater should be hosed off into the septic tank, followed by a disinfection rinse with a 1:10 (or less) bleach solution; and all contaminated rinse water shall be disposed of in the septic tank.

Note: Check with the EHB prior to conducting any corrective work to the system. Monterey County Code requires permits be issued prior to conducting substantial repair activity.