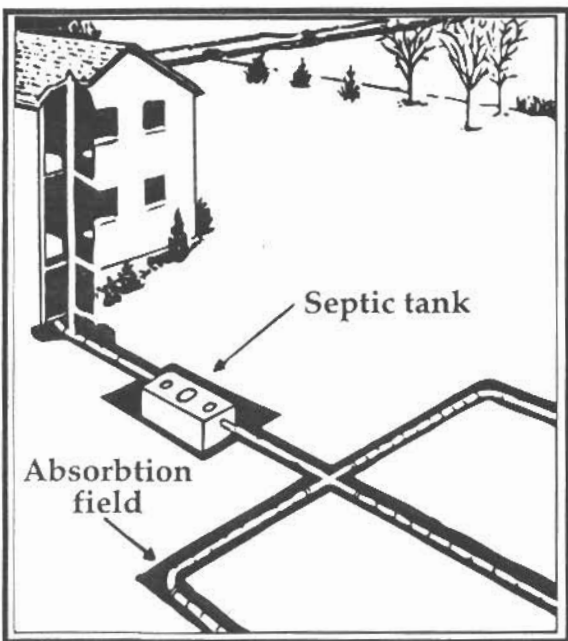




ENVIRONMENTAL HEALTH DEPARTMENT

Colorado State University Cooperative Extension

# OPERATION AND MAINTENANCE MANUAL FOR INDIVIDUAL SEWAGE DISPOSAL SYSTEMS



This brochure was designed by the Summit County Environmental Health Department and made available by a grant from the Summit County Cooperative Extension Office. Your Cooperative Extension Office is jointly funded by Summit County Government and Colorado State University. Cooperative Extension programs are available to all without discrimination.

## UTILIZATION OF INDIVIDUAL SEWAGE DISPOSAL SYSTEMS (ISDS) SUMMIT COUNTY COLORADO -- 1995

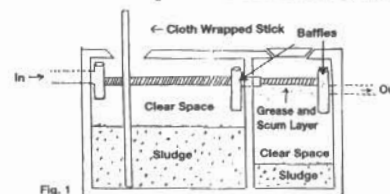
The population of Summit County has increased approximately 600% over the past twenty-five years. This has placed a large demand on the County's infrastructures. With the advent of modern public sewerage treatment facilities, Summit County has been able to provide safe, reliable wastewater treatment utility to the majority of Summit County residents. However, many Summit County homes do not have this luxury and must utilize Individual Sewage Disposal Systems (ISDS). Although wastewater treatment and disposal systems serving single homes have been used for many years, they have often been considered an inadequate or temporary solution until sewers could be constructed. However, research now demonstrates that such systems, if constructed and maintained properly, can provide a reliable and efficient means of wastewater treatment and disposal at a relatively low cost. This brochure has been developed to familiarize you with your septic system and to teach you how to perform the maintenance necessary to ensure that your system will not fail prematurely.

## WHY INSTALL A GOOD INDIVIDUAL SEWAGE DISPOSAL SYSTEM

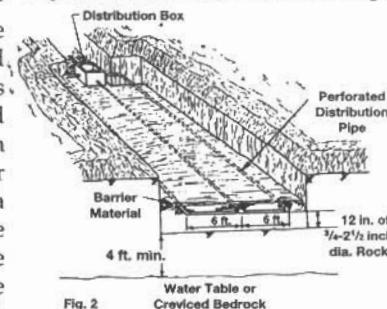
Sewage is a combination of various liquid wastes, which is discharged from a residence, building or other establishment or structure. Ponded sewage from a failing system may impact residents in various ways. As a nuisance, it could create unsightly appearances and offensive odors, and may serve as a breeding ground for unwanted insects and parasites. Obviously, such conditions can be detrimental to the surrounding area and adversely affect property values. As a health hazard, sewage may contain parasitic worms, eggs and larvae, and also microbial pathogens such as viruses and bacteria. Some of these may infect humans directly through the skin, or via animals or insects, or after ingestion of sewage contaminated food or water. For these reasons, proper installation and maintenance of an ISDS is vitally important, not only to maintain the aesthetics of the surrounding area, but also to ensure the good health and welfare of you and your neighbors.

## CRITICAL COMPONENTS OF AN ISDS

The main components of an ISDS usually consist of a septic tank (Fig.1), and an absorption field, also called a leach field (Fig.2). Septic tanks are normally constructed out of precast or cast concrete or fiberglass. Metal tanks are not allowed because they will corrode quickly due to the acidic nature of sewage.



The function of the tank is to trap and separate solids from the liquid and to serve as an environment for anaerobic bacteria which decompose the solids. The contents of the tank can normally be divided into three different, clearly definable layers. Solids will settle to the bottom of the tank, forming the **sludge** layer. Grease and soap will float to the top of the tank forming the **scum** layer, and the relatively particulate free water between these two layers is called **clear space**. The tank serves to capture the scum and sludge layers, while allowing the clear space layer to be released into the absorption field. An undersized tank will not allow sufficient separation of the layers, and consequently will allow suspended particles to be carried into the absorption field.



The absorption field receives the clarified effluent from the septic tank and distributes it underground into the soil. A standard absorption field is comprised of a series of narrow trenches or a bed partially filled with washed gravel surrounding perforated pipes. Septic effluent flows through the perforations into the gravel and surrounding soil. The soil purifies the liquid by breaking down its biodegradable components, and by filtering out microorganisms. The clarified liquid disperses away from the system by percolation, evaporation and plant transpiration. As the liquid spreads through the soil, it induces the growth of a bacterial layer called a "biomat". The biomat consumes biodegradable materials and some microbes. It also slows down the rate of percolation, allowing the effluent to percolate through unsaturated soil, thereby enhancing the soil's ability to capture microbes and nutrients which may have passed through the biomat.

## HOW TO MAINTAIN A PROPERLY FUNCTIONING ISDS

Proper design, operation and maintenance of a septic system will increase the life of the system and prevent a correctly designed system from failing prematurely. When failures occur, immediate repairs are essential to eliminate potential health hazards.

To decrease sludge accumulation and prolong the time between pumping, septic tank users can make some adjustments in waste disposal. Avoid use of garbage disposal units as they can nearly double the solids accumulation in the tank. Anything that is inert or slow to decompose should not be put into the system (i.e...grease, sanitary napkins, cigarettes).

The absorption field generally does not require any maintenance. However, to protect and prolong the life of the absorption field, homeowners should take the following precautions:

- Do not drive over the absorption field with cars, trucks or heavy equipment.
- Do not plant trees or shrubbery in the absorption field area. The roots will get into the lines and plug them up.
- Do not cover the absorption field with a hard surface such as concrete or asphalt. Grass is the best cover for the field. The grass will not only prevent erosion, but will help remove excess water.
- Divert surface runoff water from roofs, downspouts, patios, driveways and other areas away from the absorption field.
- Plowed snow should be kept away from the absorption field.

Each system is designed to treat and dispose of a specific volume and type of wastewater; therefore, using more water than the system is designed for could lead to failure of the system. Dripping faucets and leaky toilets should be repaired quickly. Washing machines and dishwashers should only be operated when full and the use of water conservation devices such as low volume

## HOW TO IDENTIFY A FAILING ISDS

A failing septic system may be very apparent or subtle. A homeowner may observe one or more of the following clues that their septic system has failed or is in the process of failing:

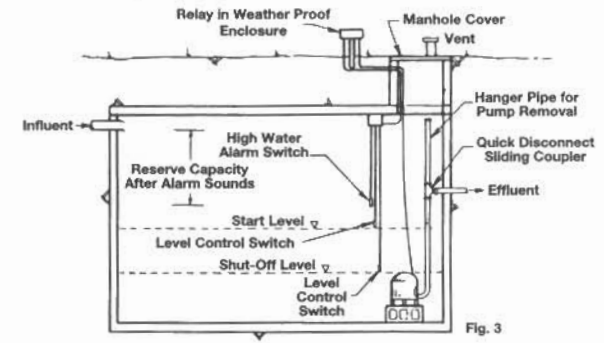
- Raw sewage backing up into the plumbing system of the house.
- Ponded water above the septic tank or absorption field.
- Plumbing fixtures such as sinks or toilets do not drain as quickly as they used to.
- Continuous damp conditions over the absorption field.
- Excess vegetation over the absorption field.
- Foul odor, similar to a rotten egg smell, emitting from the septic tank or absorption field area.
- Continuous saturated conditions or leakage on the side of road banks or natural banks or cliffs adjacent to the absorption field.
- Fecal coliform bacteria present in adjacent groundwater supplies (must be identified by a certified water testing laboratory).

## HOW TO CONDUCT MAINTENANCE INSPECTIONS

Yearly inspections should be conducted on the septic tank. To perform an inspection, the homeowner needs to locate the tank and expose the tank portals. If the portals of your septic tank are not close to the surface, approved risers and covers should be installed on all manholes to make access easier for inspection of each chamber.

Frequency of cleaning depends on the capacity of the tank and quantity and composition of the sewage. To determine if your tank needs pumping, the depth of layers must be measured. The sludge layer can be measured with a stick wrapped with a white towel.

Since the purpose of the septic tank is to remove and store solids, close attention should be given to the outlet baffles (see Fig. 1). If the baffles cannot be observed through an inspection port, a mirror may have to be used. If the baffles are damaged or removed, the scum and sludge will flow into the absorption field, resulting in a field failure. If you find damaged or missing baffles, get them replaced immediately.



Another important component of your septic tank is the dosing chamber (Fig. 3) which has been required on all new installations of ISDS since 1985. The dosing chamber is most often a third compartment in the precast tank; however, some systems have individual tanks for the dosing chamber. If the dosing chamber is at a lower elevation than the absorption field, pumps must be used. If the chamber is at a higher elevation, a dosing siphon may be used. In either event, it is important to inspect this component to ensure proper function. Dosing chambers which utilize pumps consist of a chamber, pump, pump controls and an alarm system. To inspect the dosing chamber, first locate and remove the manhole cover. Since all dosing chambers utilizing pumps are equipped with a high water alarm, the alarm can be checked by reaching into the tank with a long board with a nail inserted in the end of the board. Use the nail to snag the upper float and raise it to the upper position which should set off the high water alarm. To inspect the pump, simply use the same board to snag the lower float and raise it to the upper position which should engage the pump. Dosing chambers which utilize siphons can be checked by filling the chamber with water until the siphon engages. If the water reaches the overflow pipe in the chamber, this

The confined space within the tank contains hydrogen sulfide and methane gasses which are toxic when the fumes are inhaled. Because of this, never enter or lean into a septic tank. Methane is an explosive gas; therefore, never use flames or electrical devices near the opening of a septic tank and never smoke when inspecting the septic tank. If repairs on the tank are required, be sure to purge the gasses from the tank before beginning. Be aware, excavations of septic tanks can create a safety hazard.

### SEPTIC TANK ADDITIVES

There are many commercial additives currently available which claim to eliminate the need to clean out or claim enhanced operation of a septic system. These additives have a wide range of properties and some can actually harm the system by causing sludge bulking and accelerated absorption field clogging. No unbiased tests have shown substantial benefits of additives to the total system. The Summit County Environmental Health Department cannot recommend the use of septic tank additives to the homeowner until such time that new unbiased research proves additives to be beneficial. Be wary of products that claim to take the place of periodic tank cleaning.

### SEPTIC TANK PUMPER

Homeowners are responsible for the proper disposal of septage and may be held liable for any improper disposal. Approved septage haulers know how to manage and dispose of septic tank waste; therefore, homeowners should hire a licensed septage hauler to pump and inspect their tank. A list of licensed septage haulers is available at the Summit County Environmental Health Department.

### SEPTIC TANK ABANDONMENT

When a septic tank is abandoned because connection is being made to public sewer or to another system, the tank must be properly abandoned within 180 days of the connection. The Summit County ISDS regulations require the septic tank be pumped and either removed and properly disposed of or the tank bottom broken and the tank filled with soil or rock.

### ENSURING A SAFE DRINKING WATER SUPPLY

Proper design, location, construction and maintenance of your septic system are each important factors that will ensure that your drinking water supply is safe from disease causing pathogens. However, the only way to be sure that your water supply is safe is to have it tested by a certified laboratory. Contact the Summit County Environmental Health Department for a list of laboratories which offer this service.

### QUESTIONS OR COMMENTS

If you have any questions or comments about the information contained in this brochure, or about any other public health or environmental health issue, feel free to contact the Summit County Environmental Health Department at (970) 668-4070. If you live in the Denver Metropolitan area, you can call our Denver number, 623-2535.

TANK SIZE	HOUSEHOLD SIZE (number of people)					
	1	2	3	4	5	6
900	11.0	5.2	3.3	2.3	1.7	1.3
1000	12.4	5.9	3.7	2.6	2.0	1.6
1250	15.6	7.5	4.8	3.4	2.6	2.0
1500	18.9	9.1	5.9	4.2	3.3	2.6
1750	22.1	10.7	6.9	5.0	3.9	3.1
2000	25.4	12.4	8.0	5.9	4.5	3.7
2250	28.6	14.0	9.1	6.7	5.2	4.2
2500	31.9	15.6	10.2	7.5	5.9	4.8

Table 1. Estimated Septic-Tank Pumping Frequencies in Years

Summit County  
Environmental Health Department  
P.O. Box 5660  
Frisco, CO 80443  
(970) 668-4070



ENVIRONMENTAL HEALTH DEPARTMENT



### SEPTIC SYSTEM RECORD OF SERVICE

DATE	WORK DONE	CONTRACTOR

To maintain a properly functioning septic system, it is important to perform periodic inspections and maintenance. The Summit County Environmental Health Department recommends that you conduct annual inspections on your septic system and periodically pump your tank. A Septic System Operation and Maintenance Manual is available which outlines the inspection procedure and lists a chart showing recommended pumping frequency for your tanks. To obtain a free copy of the manual, please contact the Summit County Environmental Health Department.