PROPER USAGE AND MAINTENANCE OF YOUR SEWAGE DISPOSAL SYSTEM

A PLAIN ENGLISH GUIDE FOR THE HOMEOWNER

Dingman Township

YOUR SEWAGE DISPOSAL SYSTEM UTILITIZES…

PRIMARY TREATMENT:

- ☐ Septic
- ☐ Aerobic

FILTRATION SYSTEM:

- ☐ Free Access Sand Filter
- ☐ Bio-filter
- ☐ Recirculating Sand Filter
- ☐ Other _____

PUMPS:

- ☐ Dosing Pump
- ☐ Exterior Lift Pump

DISPOSAL FIELD:

- ☐ Sandmound
- ☐ Sandmound Trenches
- ☐ Steep Slope Sandmound
- ☐ Seepage Bed
- ☐ Seepage Trenches
- ☐ At-Grade Seepage Bed
- ☐ Spray Irrigation
- ☐ Drip Irrigation
- ☐ Absorption Area Employs a Proprietary Aggregate Substitute

INDEX

I. INTRODUCTION

a. Introduction

Welcome to your new home. Whether you built in a Lake Community, a small development, or a piece of rural acreage, your house has one thing in common with your neighbor's - your house is serviced by an **on-lot sewage disposal system**. Unlike most urban areas where sewage waste is piped to a central treatment plant, your sewage waste is processed, and disposed of on **your own property.**

Most sewage disposal systems require very little care and maintenance. If used properly, they will function for many years. However, if the system is not maintained properly, or if it has been abused, it may result in a very expensive mess.

This pamphlet is intended to provide basic information on how to correctly operate and maintain your sewage disposal system. Please read this pamphlet and if you have any questions, call the Dingman Township Sewage Department at 570-296-9260.

b. How to use this Pamphlet

On the front of this pamphlet is a list of common sewage disposal system components. The components marked with an "**x**" should indicate the components that are used in your sewage disposal system. First, read the chapter about **general information** that relates to all sewage disposal systems. Then read the sections that pertain to your system's components. Be sure to read about the optional components that are discussed at the end of each chapter.

c. General Information

In general, three criteria are used to determine what type of sewage disposal system a house may have. They are: limiting zone, percolation rate, and slope. When these factors are known a sewage disposal system is designed to fit the site. Dingman Township does **not** specify the type of sewage disposal that may be used. The choice is made by the applicant and/or the sewage system designer from the available options that are allowed by state law. Because of the seasonal high water table, shallow bedrock, and gravel with open voids that abound in Pike County, very few properties will have a limiting zone acceptable for seepage beds or seepage trenches. Elevated sandmounds are commonly used to overcome such soil limitations.

Every sewage disposal system has at least two major components, a primary treatment unit (eg. septic tank) and an absorption area (eg. sandmound). Other components (eg. filters) may be added to improve the system. In some cases these additional components are optional, in other cases these components are an integral part of the system.

II. DEFINITIONS

A / B Soils System - a sewage disposal system that involves treating septic tank effluent through a filter and often ultraviolet disinfection for ultimate disposal in an at-grade bed. A/B Soils Systems may be used in areas that do not have satisfactory soils for an elevated sandmound. These systems are also known as "Shallow Placement At-grade Systems".

Absorption Area - the portion of a sewage disposal system where the effluent exits the piping, flows through a bed of aggregate, and is allowed to seep into the ground.

Aerobic - a condition in which oxygen is present in sufficient quantities to permit oxygen dependent bacteria to thrive.

Aerobic Treatment Tank - a form of primary treatment in which air is introduced to the sewage waste. The air allows the growth of aerobic bacteria that work to break down the sewage wastes. Aerobic tanks generally are more efficient than septic tanks.

Aggregate – stone, or other approved material such as shredded tires, that surrounds the piping in absorption areas and filter tanks.

Anaerobic - a condition in which oxygen is not present. A septic tank has very little oxygen and therefore, uses anaerobic bacteria to break down the sewage.

At-grade System – a sewage disposal system in which the aggregate rests directly on top of the soil surface. At-grade systems often require intermittent filters to treat the effluent before disposal in the absorption area.

Baffle - a device installed on the inlets of tanks (inlet baffle) to direct sewage wastes downward. Inlet baffles are used to keep wastes from flowing across the surface of primary treatment tanks. They are also used in pump tanks to reduce turbulence in the tank. When installed on the outlet end of tanks (outlet baffle), the baffle allows only effluent from set levels to exit the tank. Outlet baffles are used to prevent scum and sludge from exiting a septic tank

Black Water - sewage wastewater that contains or may contain fecal matter.

Building Sewer - the piping that connects the house to the primary treatment unit.

Buried Sand Filter - an intermittent sand filter that is buried in the ground. It consists of a grid of pipes that distribute the effluent through a bed of stone and then through a bed of sand. The filtered effluent is then collected for disposal in an absorption area. Because of the large size and high cost of these filters, buried sandfilters are generally not used in Pike County.

Clarified Effluent - wastewater that has had the solid matter and grease removed.

Coco Husks – a waste product of the coconut processing industry that may be used as a biological filtration material in treating sewage effluent.

Dosing Pump - an effluent pump installed in such a way as to introduce effluent, under pressure, for distribution throughout an absorption area. A dosing pump differs from a lift pump in that a lift pump does not pressurize the effluent.

Drip Irrigation - a sewage disposal system in which the effluent is sprayed into the soil by a system of buried tubing.

Drip Lines - the tubing in a drip irrigation system in which the effluent is sprayed into the soil.

Ecoflo - a proprietary filter that uses peat or coco husks as a filtration media. The unit is manufactured by Premier Tech Ltd.

Effluent - wastewater after it has been treated by a primary treatment unit.

Effluent Filter – a filter, generally found on, or in place of, the exist baffle of a septic tank which uses mechanical and/or biological filtration to prevent suspended solids from exiting the tank.

Effluent Pump - a pump specifically designed to pump sewage effluent.

Elevated Sandmound - a type of sewage absorption area which is built on top of the land surface and in which the effluent flows through a bed of stone then trickles through a layer of sand before entering the ground.

Fecal Matter - sewage solids that are the result of food having been digested by the body.

Free Access Sandfilters - an intermittent filter system in which the effluent trickles or is periodically pumped into a tank. The effluent flows through a layer of sand before being collected for disposal in an absorption area.

Gas Deflector – see Solids Retainer.

Gray Water - wastewater from sinks, showers, laundry washers, dishwashers, etc. that has not been contaminated by fecal matter.

Grinder Pump - an effluent pump that contains components designed to shred sewage waste and toilet paper prior to pumping. Grinder pumps are typically used when raw sewage needs to lifted to a sewer line or to a primary treatment tank that is higher in elevation than the building sewer.

Ground Water - water trapped in, or flowing laterally through the soil.

Hydraulic Overload - a condition that develops when the amount of water entering a sewage disposal system is greater than the rate in which the system can process it.

Hydraulic Unit - a component of a drip irrigation system that controls the flow of the effluent to the drip lines.

Individual Residential Spray Irrigation System (IRSIS) - a sewage disposal system, designed only for a single house that disposes of treated effluent by spraying it on the ground surface.

Inspection Port - a pipe extending from a tank to the surface of the ground that allows a person to monitor the interior of the tank.

Intermittent Filter - a system of piping and filtration media that receives effluent on a periodic basis to provide filtration and biochemical treatment.

Lift Pump - an effluent pump designed to lift sewage to a higher elevation. Lift pumps are typically used to raise sewage effluent from a tank at a lower elevation to a tank at a higher elevation.

Manhole - an opening in a tank that allows a worker to enter the tank. ***Never enter a sewage tank manhole! Poisonous gasses in the tank may result in death.*** Only trained professionals with the proper equipment should be allowed to enter your tanks.

Multiple Compartment Septic Tank - a single tank with interior walls that separate the tank into individual compartments. With the addition of baffles, the compartments become septic tanks equal to same sized individual tanks placed in series.

NSF - (formerly the National Sanitation Foundation) a non-profit corporation that develops standards and testing procedures for products related to, among other things, water systems, food service, solid waste management, and sewage disposal. In Pennsylvania, a seal is required on aerobic tanks indicating that the tank meets or exceeds NSF standard 40 or an equivalent testing program.

Organic Clogging - a condition caused by suspended solids entering an absorption area at a rate greater than the rate in which it decomposes in the absorption area. The result is a semi-permeable mat that restricts the transfer of effluent to the soil.

Peat - the remains of plants, generally sphagnum moss, that have partially decomposed under anaerobic conditions. While the material is essentially the same as peat moss used in gardening, peat used in sewage filters must meet certain grading requirements.

Proprietary Aggregate Substitute – a manufactured material or device approved to replace stone aggregate in an absorption area.

Pump Tank - a tank designed to contain a grinder, effluent, or lift pump.

Puraflo - a proprietary filter that uses peat as a filtration media. The unit is manufactured by Anua Inc.

Recirculating Sand Filter – a highly efficient filter in which septic tank effluent trickles through a layer of sand, into a layer of stone, then into a collection pipe to be conveyed back to the pump tank. The pump then returns the filtered effluent to the filter for another pass through the sand. During each pass through the filter, a certain amount of effluent released to flow through to the absorption area.

Scum - the accumulated fat, grease, and other lighter than water components of decomposing sewage wastes that float at the top of a septic tank.

Septic Tank - a primary treatment tank in which the sewage waste separates into sludge, scum, and clarified effluent and where these components are treated by anaerobic bacteria.

Sewage Hauler - a person, or company, licensed by the Commonwealth of Pennsylvania to remove sludge and other sewage wastes from sewage disposal systems.

Shallow Placement At-grade System – see A/B Soils System.

Sludge - solid matter that has settled from the wastewater and allowed to decompose on the bottom of a septic tank.

Solids Retainer – a barrier used to deflect suspended solids away from the exit baffle of a septic tank. An effluent filter may often serve as a solids retainer. Solids retainers are also referred to as a gas deflector.

Submersible Sump Pump - a pump designed to lift water to a higher elevation. Most submersible sump pumps are only intended for occasional use and are not constructed for use in corrosive environments. For that reason, they should not be used in a sewage disposal system.

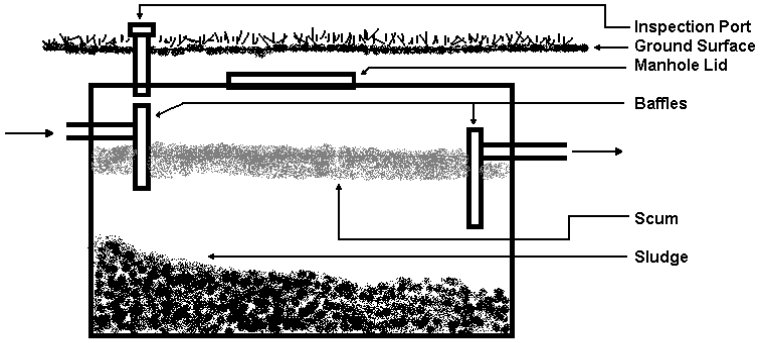
Ultraviolet Disinfection – the use of ultraviolet light to kill pathogens in the sewage effluent.

III PRIMARY TREATMENT

There are two types of primary treatment: septic and aerobic. Septic tanks use an anaerobic process (without oxygen). Aerobic tanks add air to create a more efficient treatment process.

a. Septic Tanks

Sewage waste flows from the house into a septic tank. Upon entering the tank the sewage waste is deflected downward by a baffle. Solids heavier than water (sludge) settle to the bottom. Fats, grease, and components that are lighter than water (scum) float upward and are trapped between the baffles. The clarified liquid (effluent) flows out the other end of the tank.



Typical Septic Tank

The anaerobic bacteria that reside in the septic tank consume some of the waste, however, the bacteria are very inefficient and the sludge will usually accumulate in depth. With increased use, solids and/or grease often escape from the septic tank and clog the absorption area. **Suspended solids escaping from the septic tank is the #1 cause of sewage system failure in Pike County!** Grease escaping from the septic tank is the #2 reason. It is very important that you pump your septic tank on a periodic basis.

A septic tank is designed so that homeowners may test for excessive sludge. To test, take a 10 foot long dowel or furring strip. Wrap a cloth baby diaper or similar material to the dowel/furring strip so that it covers at least 3 feet. Duct tape the diaper securely in place. Remove the inspection port cap. Insert the dowel/furring strip until it hits the bottom of the tank. Remove the dowel/furring strip and look at the diaper to determine the depth of the sludge — just like checking your oil.

If the sludge is less than 2 feet deep, your system should be okay for now. Two to three feet of sludge indicates that you should pump the tank soon. Three feet or more, you may be damaging the sewage disposal system. The rate in which the solids accumulate varies by household use, so the system should be checked frequently until a usage to depth rate is determined.

Because checking the depth of the septic tank sludge is a dirty, smelly job, most homeowners opt to pump their septic tanks on a routine basis, usually annually or biannually.

You must hire a licensed sewage hauler to pump the septic tank. You will find numerous firms listed in the yellow pages under the heading "*Septic Tank - Cleaning and Repairing*". When the sewage hauler pumps the septic tank, make sure they pump from the manhole in the center of the tank. Because the manhole is usually buried, some unscrupulous sewage haulers may try to save time by pumping through the inspection port. **Do not allow this to happen!** Pumping through the inspection port may break the septic tank's baffle, flush solids or grease out of the tank, and will often result in a less than satisfactory cleaning.

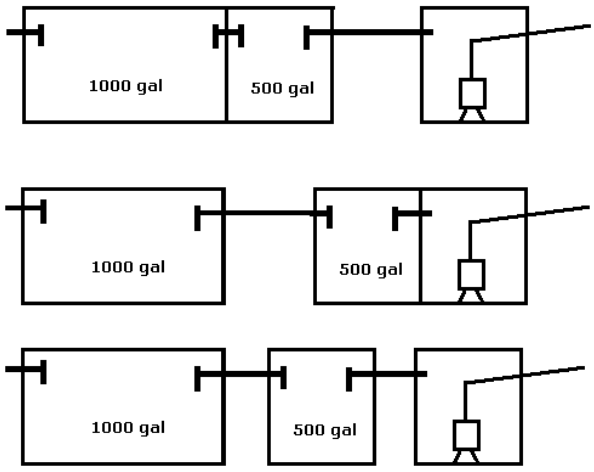
Warning:

Never enter a septic tank or pump tank! Sewage produces gases that can kill quickly and without warning. If work needs to be done in either tank, it is best to call a professional.

b. Multi-Chambered Septic Tanks

All septic tank based sewage disposal systems that were permitted after November 1997, and many permitted before, utilize either multiple septic tanks or multiple chambered tanks. The theory is that effluent leaving the first septic tank or septic tank chamber flows into a second septic tank or septic tank chamber for additional clarification of the effluent. In rare cases, the system may employ 3 or 4 tanks/chambers.

Multiple septic tank / multiple chamber septic tank systems require the same care and maintenance as a single septic tank sewage system. Homeowners should remember that each tank or chamber must be pumped periodically to ensure proper operation of the system.



3 Typical Septic Tank Configurations

c. Proper Care of Your Septic Tank

- **Pump your septic tank frequently!** Pumping too frequently will not hurt the system. Not pumping frequently enough will eventually result in problems.

- **Be wary of septic tank additives!** Studies performed at leading universities have concluded that most septic tank additives provide little, if any, benefit to the operation of the septic tank. In fact, some products have been proven to actually harm sewage disposal systems.

- **Use household chemicals in moderation!** Go ahead, use a little bleach, drain cleaner, or toilet cleaner. But use it in moderation. Remember, your sewage disposal system relies on bacteria to function. Chemicals that kill the bacteria will cause sewage disposal system problems.

- **Do not pour paints, oils, grease, or similar products down the drain!** Your septic tank also acts as a grease trap. But space is limited. Don't fill it unnecessarily. In addition, it is against State Law to introduce these products to a sewage disposal system.

- **Do not pour cooking grease, fats, or oils down the drain!** Pour cooking grease, fat, and oil into a steel can and refrigerate. Dispose of with your garbage.

- **Do not flush anything down the toilet, but human waste and toilet paper!** Do not flush cigarette butts, leftover food, contraceptive products, feminine hygiene products, disposable diapers, dental floss, paper towels, etc. down the toilet.

- **Use low sudsing / no phosphate detergent whenever possible!** High sudsing detergents have high levels of surfactants. These chemicals can cause the sludge and/or scum in the tank to go into suspension and exit to the tank with the effluent. High levels of phosphates in the effluent may cause clogging of the absorption area.

- **Spread your week's laundry over several days!** Do not do all your laundry on one day. Excessive laundry washing may hydraulically over load the sewage disposal system and/or flush solids from the septic tank. Spacing wash loads over several days reduces the chance that problems may occur.

- **Conserve water!** Excessive water usage may flush solids from the septic tank or hydraulically overload your absorption area.

Remember

The 2 key rules of septic tank operation are…

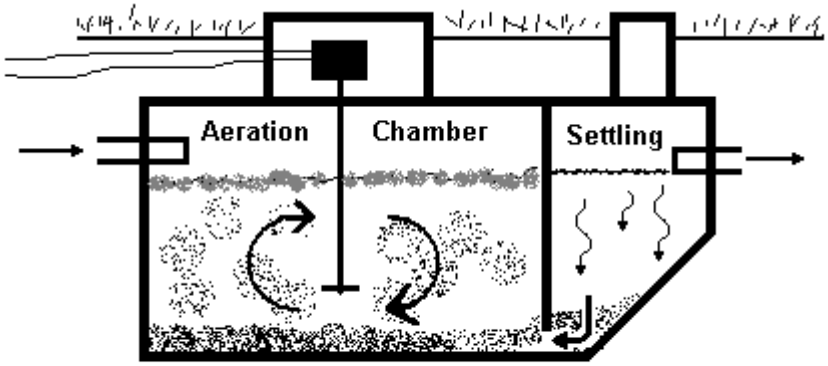
Pump your septic tank frequently

- - - and - - -

Put nothing in the septic tank but human waste,
toilet paper, sink, bath, & laundry water.

d. Aerobic Tanks

Aerobic treatment tanks are essentially miniature sewage treatment plants. There are many different treatment processes, but they all work on one basic principle — the introduction of air to grow aerobic bacteria. Aerobic bacteria are much more efficient than anaerobic bacteria in the processing of the sewage waste.



Typical Aerobic Tank

In a typical aerobic tank, the sewage flows from the house into the tank's aeration chamber. In this chamber, the sewage is agitated and air is introduced. After the sewage is aerated, it flows into a second chamber for settling. In this chamber, any suspended solids are settled out and reintroduced into the aeration chamber. The clarified effluent then flows out of the tank.

Aerobic treatment tanks have some advantages over septic tanks….

- Aerobically treated effluent is generally much cleaner than septic tank effluent.
- Aerobic tanks produce very little, if any, odor.
- In many cases, use of an aerobic tank will allow the use of a smaller absorption area.

However, aerobic tanks also have some disadvantages…

- Aerobic tanks require electricity, have mechanical parts that might break down, and may produce noise.
- Aerobic tanks generally are often not very effective in removing fat and grease.
- Excessive use of laundry detergent may result in suds flowing from the air intakes of the tank.

One popular misconception is that aerobic tanks never need to be pumped. This can not be further from the truth. Despite the claims of some manufacturers, sludge will often form in the tank (although at rates much slower than septic tanks). Add to this items that do not degrade readily in the aerobic tank such as corn, celery fibers, food that may fall down the sink, and other items that do not belong in the tank such as cigarette butts. The result can be a mess that may

clog critical parts. For this reason, the National Small Flows Clearing House recommends that homeowners have their aerobic tanks pumped on an annual basis.

DO NOT

Turn off the power to your aerobic tank.

It is a violation of State Law punishable by a fine of between
$ 500.00 and $5000.00 and/or 90 days in jail.

e. Proper Care of Aerobic Tanks

- **Conserve Water.** Aerobic Tanks are sized to perform based on the estimated water usage of the house. Excessive water use may prevent the system from operating correctly and might cause damage to the absorption area.

- **Pump your aerobic tank regularly** to remove built up sludge and materials that degrade too slowly.

- **Only factory authorized service representatives** should work on your aerobic tank. Repairs or modifications performed by others may appear to function correctly but may seriously affect the performance of the system.

- **Do not install a garbage disposal** unit on a sewage disposal system that uses an aerobic tank.

- **Do not use your aerobic tank as a garbage can.** Do not flush coffee grounds, dental floss, diapers, feminine hygiene products, cigarette butts, condoms, or anything but human waste and toilet paper down your toilet.

- **Do not pour chemicals down the drain.** Pouring paint, varnish, pesticides, herbicides, gasoline, and petrochemicals down the drain will not only hurt the sewage disposal system, but is also a violation of State and Federal Law.

- **Do not pour cooking oil or grease down the drain.** Many aerobic tanks are very inefficient in grease removal and may allow it to pass to the absorption area.

- **Spread laundry out over the week.** Do not wash all loads on the same day. Excessive laundry washing can disrupt the operation of the aerobic tank and cause "foaming" problems.

IV FILTERS

Many sewage disposal systems utilize filters to further remove suspended solids from the effluent. In Pennsylvania, four types of filters are commonly used: effluent filters, bio-filters, free access sandfilters, and recirculating sandfilters.

a. Effluent Filters

Effluent filters are a system of very fine screens that are designed to hold back suspended solids that are transported by the effluent when it exits the septic tank. There are various models of effluent filters on the market sold under names such as Ecco, Bio-Kinetic, Poly-loc and Zabel. Effluent filters are optional on most sewage disposal systems. However, some systems, (eg. those employing bio-filters) require their presence as a mandatory component.

Effluent filters are usually found in place of the outlet baffle of the septic tank or the outlet baffle of the last septic tank on multiple tank systems. Occasionally the effluent filter will be found in a separate tank after the septic tank.

Effluent filters are fairly efficient in filtering suspended solids. However, they are not a substitute for pumping the septic tank. Even the best filters have holes that are 1/64 of an inch in diameter and many have holes up to 3/16 of an inch. Effluent filters screen out the larger solids but allow finer particles to pass. Homeowners must maintain effluent filters according to the manufacturer's recommendations. Typical maintenance requires that the filter be removed and washed down with a garden hose on a periodic basis. As a rule of thumb, the filter should be cleaned at least as often as the septic tank is pumped. Failure to clean the filter on a timely basis could result in either the effluent backing up into the house, or the filter becoming so heavy it snaps off into the tank.

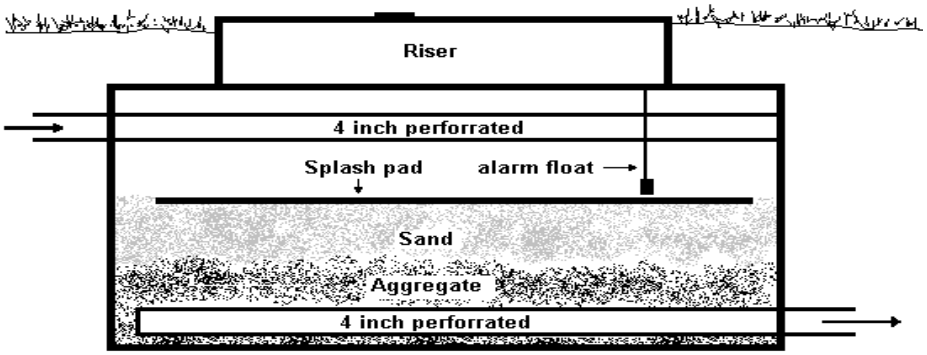
b. Bio-filters

Currently there are two bio-filters approved for use in Pennsylvania. The first, Ecoflo is a proprietary unit manufactured by Premier Tech Ltd. The second, Puraflo is manufactured by Anua Inc. Both are intermittent filters and have been used extensively throughout Canada and several American states. The bio-filter unit is placed after the primary treatment tank. The effluent enters the top of the unit and is allowed to trickle through sphagnum peat (the material known to gardeners as peat moss) or coco fiber. Studies have shown that these products are excellent filter media and can produce very high quality effluent.

Both filters require annual maintenance. The unit must be inspected by a qualified technician who will also scuff up the surface of the media to ensure it remains permeable. This service is usually included in the cost of the unit. Eventually the media must be replaced. A licensed sewage hauler must remove the old media and new media must be added by a qualified technician.

c. Free Access Sand Filters

Free access sand filters are intermittent filters commonly used in spray irrigation and drip irrigation systems and have been approved for discharge into absorption areas. The filters consist of a concrete tank, not unlike a septic tank. Effluent flows into the tank. It drips through a layer of sand and into a layer of gravel. A collection pipe then collects the effluent and allows it to exit the tank.



Typical Gravity Flow Free Access Sandfilter

The sand filters out suspended solids which degrade on the sand surface. If the suspended solids collect at a rate faster than they degrade, a build up will occur and the sand's permeability will be reduced. If the effluent ponds on the sand, an alarm is triggered which indicates that maintenance is required.

To maintain a free access sand filter, the homeowner needs only to open the manhole. Using a steel garden rake, the sand surface is raked of obvious organic material and the surface is roughed up. Over time, raking the sand may not alleviate the effluent ponding. Should that occur, the sand must be replaced. To extend the life of the sand, it is recommended that the homeowner rake the sand on a quarterly basis.

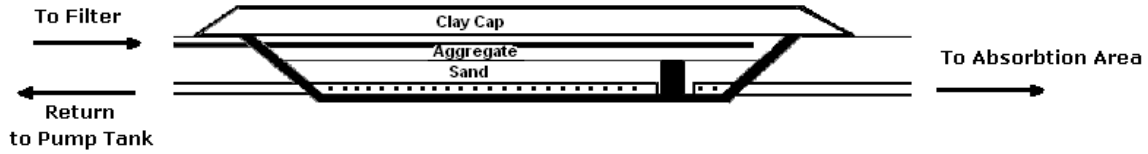
d. Buried Sand Filters

Buried san filters are similar to free access sand filters. Constructed on site with thick plastic sheeting, the filter is very large to reduce solids build up. Buried underground, the filter can not be maintained and can hydraulically overload or fill with grease or solids if abused.

e. Recirculating Sand Filters

Recirculating sand filters are a highly efficient means of cleaning the effluent. Septic tank effluent enters the filter and drips through a layer of sand. The effluent is collected by a pipe and conveyed to the pump tank. The treated effluent is then pumped back into the filter. The process is repeated numerous times. During these cycles, a certain amount of effluent is discharged into the absorption area for disposal in the soil. While the filtered effluent is being recirculated through the filter, new septic tank effluent is added. The newly added effluent provides a carbon source that allows the filter to denitrify the effluent.

Generally, permits issued for systems that utilize recirculating sandfilters have a requirement that the designer provide the homeowner with a detailed maintenance and operations manual for the system. The system users should familiarize themselves with the manual and maintain the system accordingly. If the filter allows access, filter maintenance involves periodically raking the surface of the sand to break up any surface crust that has developed. If the septic tanks are properly maintained, in most cases raking the surface on a quarterly basis should suffice. The pumps and pump tanks should be maintained the same as dosing pumps/tanks and lift pumps/tanks.



Typical Recirculating Sand Filter

f. Other Media Filters

From time to time, manufacturers develop filters utilizing a variety of media ranging from glass particles to spun fibers. If these products undergo a rigorous testing process, they may obtain approval for use in Pennsylvania. The use of such proprietary products carries a requirement that the product be used and maintained in a manner approved by both the Commonwealth and the manufacturer. The homeowner should discuss maintenance procedures with the Sewage Enforcement Officer prior to use.

V PUMPS AND PUMP TANKS

Pumps are a very common component in Pennsylvania sewage disposal systems. It is very important that homeowners are aware of the different types of pumps available and the different uses in which pumps should be employed. The three basic types of pumps are effluent pumps, grinder pumps, and submersible sump pumps.

There are also two basic uses for pumps. The first use is to lift the sewage to a component that is at a higher elevation. These are called lift pumps. The second use is to pressurize the effluent and to spread it evenly over an absorption area. These are called dosing pumps.

a. Effluent Pumps

These pumps are designed for the purpose of pumping sewage effluent. They are the preferred pumps for dosing absorption areas and for lift pumps when placed after a primary treatment tank.

b. Grinder Pumps

Grinder pumps are basically effluent pumps with one major difference - the impeller contains teeth designed to shred fecal matter and toilet paper. Grinder pumps are generally used as lift pumps when the pump is placed before the primary treatment tank. Grinder pumps may also be used as a substitute for effluent pumps provided that they meet the same pressure and flow specifications. However, due to the much higher cost of the grinder pumps, such substitution is not recommended.

c. Submersible Sump Pumps

Submersible sump pumps look like effluent pumps and are often sold as an inexpensive replacement for such. However, they are designed for the occasional pumping of clean water. They are not designed for sustained use in the highly corrosive environment created by sewage. They will often break down within weeks of installation. **Do not use submersible sump pumps in place of effluent pumps.**

d. Replacing Pumps

Most effluent and grinder pumps are warranted for 1 to 3 years but should last for at least 5 to 10 years. Lightning, electrical surges and sewage system abuse may substantially shorten the pump's life. Alarms are placed in pump tanks to alert the homeowner when the pump fails. The homeowner may find companies who service and replace sewage pumps in the yellow pages under the heading of "*Pumps"*.

Pumps should be replaced with the same brand and model. Do not be tempted to increase the horsepower. It will not increase the efficiency of the sewage disposal system and the increased back pressure may shorten the life of the new pump. If the same make and model is not available another brand may be substituted. The pump must be matched so that it has the proper pressure at the proper rate of flow. Do not rely on comparing the rated horsepower as the performance of pumps varies greatly between manufacturers despite similar horsepower ratings.

The rate of flow is measured in "gallons per minute". The homeowner can find the appropriate flow by looking at the sewage permit plans. The pressure is measured in "feet of head". In most cases, the head pressure required to operate the system will vary from that shown on the sewage permit. This may be due to the relocation of the house or tanks or the lowering of the primary treatment tank to account for such items as basement toilets. The head pressure may be approximated by measuring the elevation change (in feet) from the bottom of the pump tank to the top of the absorption area then adding 6.

Warning:

Never enter a septic tank or pump tank! Sewage produces gases that can kill quickly and without warning. If work needs to be done in either tank, it is best to call a professional.

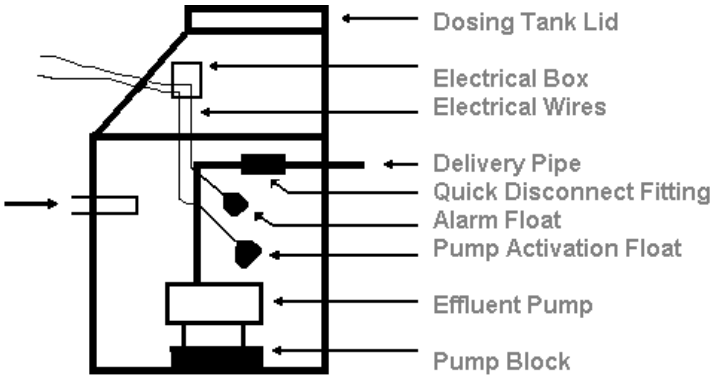
e. Dosing Tanks

Dosing Tanks are placed after the primary treatment tank. They house a pump intended to pump the effluent and distribute it evenly across the absorption area (pressure distribution). The pump is seated on a cement block, flat rock, or other platform. There are usually two floats in the tank. The lower float is the pump activation float. When it is in the down position, the pump is off. As the effluent level rises, it lifts the float and trips the mercury switch in the float activating the pump. When the float drops, the pump is shut off. Should the pump not activate, the rising effluent will lift the upper float. When the float rises, it triggers the warning alarm. The alarm is in the house and involves an audible alarm (usually a buzzer) and a visual alarm (usually a red light).

When the alarm sounds, the homeowner must act immediately. The first action the homeowner should take is to put the alarm into the silent mode. Next, the homeowner should check the electric circuit breaker box to see if the sewage pump's breaker may have tripped.

Then the dosing tank should be inspected. Look for any problem that may have accidentally prevented the pump float from activating such as the float getting hung up on the wires. Look to see if the alarm float has fallen to a position lower than the pump float. If either of these has occurred, they may be remedied by a qualified technician. The homeowner should also check to see if the pump is running, but not pumping the effluent. This may indicate a clog in the piping or the absorption area.

After checking the circuit breaker and pump tank, the homeowner should call a professional to replace the pump. Such firms may be found in the yellow pages under the heading "*Pumps".*



Typical Dosing Tank

Finally, to help protect the pump and the absorption area, the dosing tank should be pumped by the septage hauler whenever the primary treatment tank is pumped to remove any solids or grease that may have escaped the primary treatment tank.

f. Lift Tanks

Lift tanks contain pumps intended to lift sewage to a higher elevation. They involve two basic types: effluent lift pump tanks and grinder lift pump tanks.

Effluent lift pump tanks lift clarified effluent. They are found after primary treatment tanks and are used to lift effluent to non-pressurized absorption areas, dosing tanks (or other lift tanks) located uphill of the house, and to deliver effluent to free access sand filters. Effluent lift tanks are set up in the same manner as dosing tanks and maintenance should also be handled the same.

Grinder lift pump tanks may be found either outside the house and set up similar to a dosing tank or as a manufactured unit designed to be placed inside the house. Outside grinder pump tanks should be maintained like dosing tanks. Those designed for inside use should be maintained as per the manufacturer's recommendation.

g. What to Check in a Pump Tank

- **Look for corrosion around the electrical boxes.** Excessive corrosion may cause an electrical disruption to the pump. Have an electrician correct the problem immediately.

- **Look for grease floating on the surface of the effluent.** The presence of grease in the tank indicates that there is a problem with the primary treatment tanks, or that the primary treatment is not being maintained properly.

- **In the pumped down tank, look for sludge coating top of the pump and other components.** The presence of sludge in the tank indicates that there is a problem with the primary treatment tank, or that the primary treatment tank is not being maintained properly.

- **Observe the tank for any sign of groundwater infiltration.** Look for wet areas where the pipes and wires enter the tank, around the seams and joints in the tank, and near top of tank. Look for mud in the tank. If seepage or mud is found in the tank, call a qualified professional to seal the tank.

- **When the house's water is not in use, look for effluent flowing from the delivery pipe into the tank.** Such water flow is indicative of ground water seeping into the primary treatment tank. Call a qualified professional to seal the tank.

VI Absorption Areas

An absorption area is the component of a sewage disposal system in which the effluent exits the piping and seeps into the soil. In some cases the absorption area may be constructed on top of a pile of sand (elevated sandmound). In other cases it will be constructed directly in, or upon the ground. For purposes of this pamphlet, the term absorption area will include the spray zone of spray irrigation system and drip zone of drip irrigation systems.

a. Seepage Beds

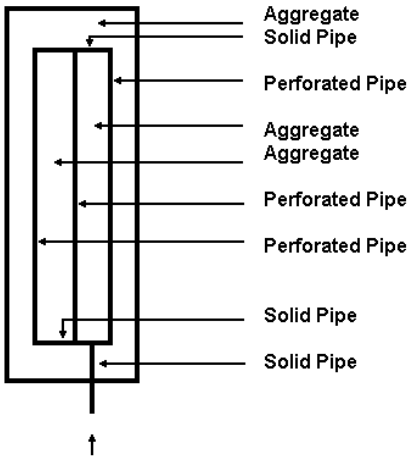
Seepage beds and shallow placement seepage beds are commonly known as in-ground, standard, or conventional sewage disposal systems. (The latter is particularly incorrect as most sandmounds are also classified as conventional systems and some seepage beds may not be.) Seepage beds usually involve the use gravity to deliver the effluent to 3” or 4” diameter perforated pipes from which the effluent flows to the soil. The effluent may also be delivered by means of a lift pump designed to raise the effluent to the perforated pipe or the seepage bed may utilize 1 1/2 or 2 inch pipe and be pressure dosed.

The most common problems that occur in seepage beds are the organic clogging of the soil/aggregate interface, hydraulic overload, tree root penetration, soil barrier failure, and the erosion or compaction of the cover soil.

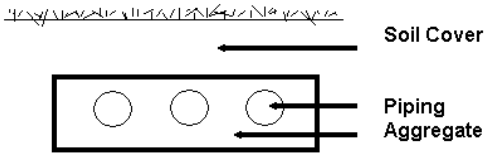
Organic clogging is usually the result of problems with the primary treatment tank. Suspended solids that escape the primary treatment tank remain in the aggregate and decompose. When the amount of suspended solids that enter the aggregate is greater than the rate in which they can decompose, clogging will occur. It is of the utmost importance that the homeowner maintains the primary tank correctly.

Hydraulic overloading is the introduction of more effluent (or groundwater) than the system can handle. Homeowners must make sure that the house's water usage is within the parameters for which the system was designed. Rainwater should be diverted away from the system by crowning the soil over the seepage bed area. The bed and tanks should be protected from stormwater runoff and the discharge of roof drains. Tanks should be checked for groundwater leakage.

Soil erosion and compaction must also be avoided. Do not place sandboxes, swing sets, play areas, or other objects on top of the seepage bed that would encourage walking or playing on the seepage bed. The cover soil may settle after construction and form a concave area. The homeowner should fill the settled area until it is slightly crowned. The homeowner should also be sure to get a dense cover of grass growing over the absorption area to keep the soil from settling into the aggregate.



Typical Seepage Bed - Top View



Seepage bed - cross section

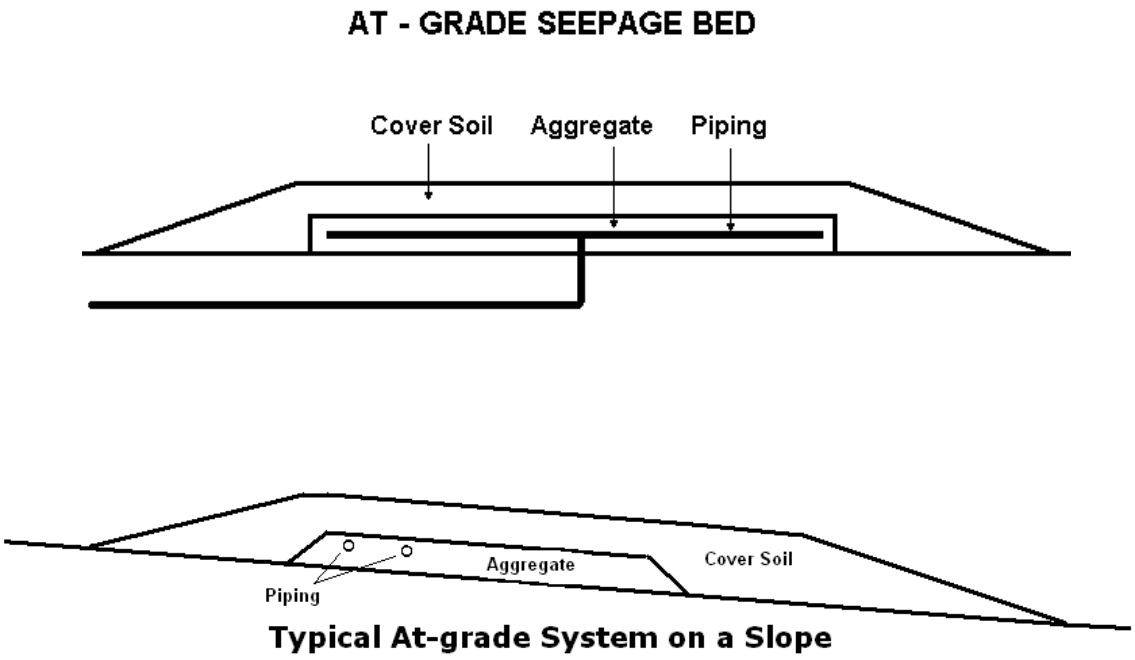
In most cases, improper maintenance of the absorption area will result in the effluent puddling on the surface. The puddling may occur all the time or it may occur only when the sewage disposal system experiences a particular level of use. In some cases, the effluent will discharge to the surface in response to certain climatic conditions such as after a heavy rain or when the water table is high. Should the cover soil be compacted and not very permeable, the effluent will often back up into the house causing sluggish drains and eventually discharge from the drain that is located at the lowest elevation.

Another common problem involves homeowners planting trees, shrubs, or other plants, or allowing wild vegetation to grow on, or too close to the absorption area. Roots of such plants, looking for free water and nutrients will often clog the absorption area. For this reason, it is best if grass is the only plant allowed to grow on an absorption area. The grass over the absorption area should be mowed regularly so that it grows thick and not sparse.

Finally, most soil barriers will fail over time. A soil barrier is a layer of hay, straw, or geo-textile fabric placed on top of the aggregate to keep the cover soil from dropping into the aggregate. Over time, the hay or straw will rot. If the grass roots are not sufficient to hold the soil in place, the soil will drop into and clog the aggregate and result in the system's failure. This is not a problem when geo-textile fabric is used as a soil barrier.

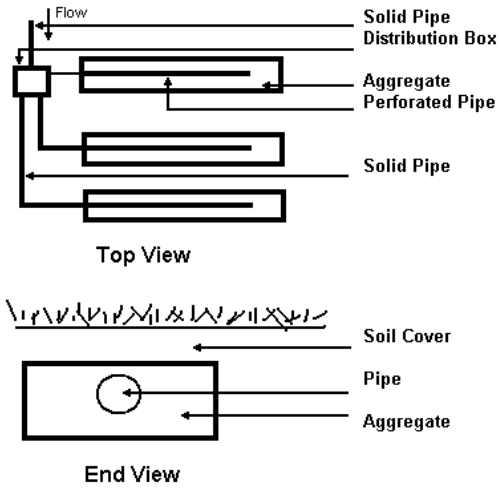
b. At-Grade Seepage Beds

At-Grade seepage beds are essentially the same as seepage beds except that the absorption area is built upon the surface of the ground. Maintenance would be the same as previously described for seepage beds that employ dosing pumps with one additional requirement. The property owner should periodically inspect the area around the base of the soil cover for any leakage that might occur.



c. Seepage Trenches

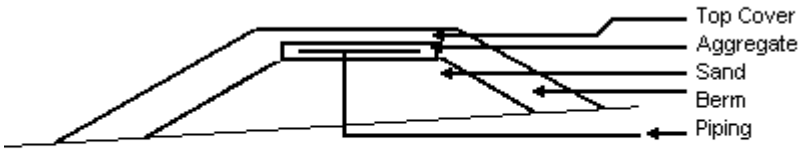
Seepage trenches are a series of one pipe seepage beds. They are generally used on steeper slopes where beds are not permitted. Maintenance should be the same as for seepage beds. Seepage trench systems may involve several trenches and may cover a large area. Furthermore, the trenches need not be parallel. It is important that the homeowner know the full size and extent of the trench system so that adequate protection may be maintained.



Typical Seepage Trench System

d. Elevated Sandmounds

The most commonly permitted sewage disposal system in Dingman Township is the pressure dosed elevated sandmound. The system consists of a pile of specially graded sand on which the absorption area is constructed. Both the absorption area and the sand are encased in soil which is referred to as berm. In most cases, problems with the mound can be attributed to problems with the primary treatment. Sludge being pumped into the absorption area is the #1 cause of mound malfunction. Grease being pumped to the mound is #2. In both cases the waste that should have been held in the primary treatment tank is pumped into the mound and forms a semi-permeable layer at the aggregate/sand interface. As the permeability is reduced, the pressurized effluent is forced through the weakest point in the berm. Similar blowouts will occur if



Typical Elevated Sandmound - End View

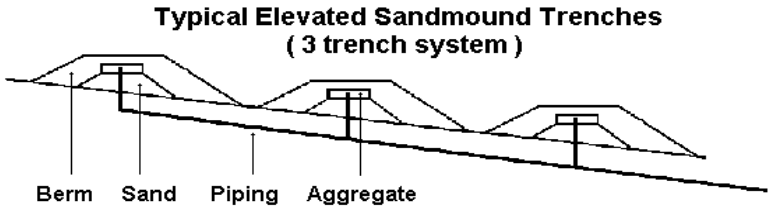
excessive effluent is pumped into the mound. This may be the result of excessive household usage or groundwater seepage into the system's tanks.

Mounds also suffer from invasion by tree roots and soil barrier failure (see Seepage Beds).

Quarterly, the homeowner should walk around the mound. Look for any effluent leakage. Areas of dark green grass, especially during droughts, should be checked frequently as effluent may be starting to leak through.

e. Elevated Sandmound Trenches

When the ground is too steep to site a conventional elevated sandmound, the property owner may often be able to site elevated sandmound trenches or a steep slope elevated sandmound. Elevated sandmound trenches are simply a series of single pipe elevated sandmounds. Maintenance is essentially the same as that of an elevated sandmound. (See elevated sandmounds.) However, there are two concerns that require further discussion.



First, it is important to remember that each lateral is at a different elevation. Sometimes the elevation difference is a matter of inches, other times it may be twenty feet, or more. The pump that was installed during the construction of the system was tested to ensure adequate pressure in all laterals. However, a replacement pump of only slightly less head pressure may not provide sufficient pressure to the upper laterals. While the system could appear to function correctly, only the lower laterals would be working and a malfunction might eventually occur. Therefore, it is very important that the homeowner replace the dosing pump with the exact make and model pump as was previously installed.

Second, with the steeper ground underneath the system, there is a greater chance of downslope leakage. The homeowner should periodically check the downslope side of the trenches for leakage.

f. Steep Slope Elevated Sandmounds

The second sandmound option for sites with steeper slopes is the steep slope elevated sandmound. Essentially, the system is the same as an elevated sandmound and maintenance should be performed the same. (See elevated sandmound.) Because of the steeper slope of the ground, the property owner should periodically examine the downslope side of the system for possible leakage.

g. Spray Irrigation

Spray irrigation is a sewage disposal system where the home owner treats the sewage waste, then discharges the effluent on to the surface of the ground. Through primary treatment, filtration, and chlorination, the effluent becomes very clean with most of the nutrient and pathogens removed by the system. The vegetation in the spray zone provides the final renovation and nutrient removal.

Spray irrigation has been around for a long time, but is relatively new in Pike County. Prior to 1994, the state considered it an experimental system when used for single family residences. The regulations required large tanks to store the effluent when it could not be pumped due to inclement weather. In 1994, all that changed. The system was revised, new regulations written, and a version known as Individual Residential Spray Irrigation System (IRSIS) was created.

When the IRSIS regulations were written, the State allowed for many options. The system designer could choose either septic or aerobic as the primary treatment. The filters could be free access sand filters, buried sand filters, or bio-filters. Chlorination may be through erosion chlorinators or injected liquid chlorine. As such, it would take many pages to address all the maintenance requirements for every possible component. However, unlike the other systems permitted in Pennsylvania, the IRSIS regulations provide protection to the homeowner.

In order to obtain a permit to install an IRSIS system, the homeowner must hire a qualified person to design the system. As part of the application process, the designer must prepare a maintenance manual that is custom designed for the individual system. The homeowner must maintain the IRSIS system in accordance with their system's maintenance manual. When the property is sold, the maintenance manual must be transferred to the new owner. If the manual is not transferred, then the new owner should immediately contact the Township Sewage Office to request a copy.

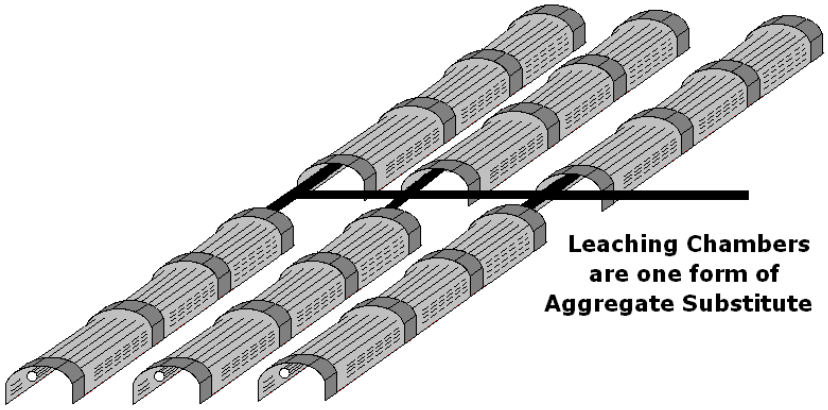
h. Drip Irrigation

Drip irrigation has been used for many years in several southern states and was approved for use in Pennsylvania starting 1999. The system may be built in several different configurations using various components. Primary treatment may be either septic or aerobic. In some, but not all cases, filtration is required which may be in the form of a free access sand filter, bio-filter, or buried sand filter. The effluent is further filtered by special ceramic disk filters before being pumped to the hydraulic unit. From the hydraulic unit, the effluent is switched to the distribution system which consists of special tubing that is buried in the ground. The drip tubing has built-in weirs and emitters that regulate the water flow from the tubing into the soil.

Drip irrigation is a relatively easy system to maintain as the system has many self-cleaning features. However, a certain degree of maintenance is still required. The homeowner should review the components of their system to determine what form of primary treatment and filtration their system employs. Then review this manual for the proper care of the individual components. Components in the pump tank and hydraulic unit should be maintained in accordance with the manufacturer's recommendations.

i. Proprietary Aggregate Substitute

Numerous products are found nationwide, and Pennsylvania allows several types of proprietary aggregate replacements. Ranging from quonset hut-like structures to pleated filtration material, these products are designed to replace stone aggregate in a variety of sewage disposal systems. Aggregate substitutes generally function better than stone and may extend system life. Usually there are no maintenance requirements other than those generally prescribed for the system type.



j. Proper Care of Your Absorption Area

- Do not allow children to play, or other activities to take place on, the absorption area. Do not place gazebos, playhouses, tennis courts, sheds, above ground pools, etc. on top of absorption area. **It is very important to prevent soil compaction.**

- Crown the absorption area to keep rain and run off water out of the absorption area.

- Pump your primary treatment tank regularly. Keep suspended soils out of the absorption area.

- Fix erosion promptly.

- Keep a good cover of grass growing on the absorption area. Grass holds cover soil in place, deters erosion, and aids in the renovation of the effluent.

- Do not allow trees or brush to grow on, or close to, absorption areas. Roots will clog aggregate and piping.

- Do not plant anything but grass on absorption area. Vegetables are ***especially prohibited*** as consumption could result in a health hazard.

VII MAINTENANCE LOG

Primary Treatment Tank

Date Pumped	Name of Sewage Hauler	Comments
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Attention Property Owners!

Pennsylvania Act 287 of 1974

requires that any person who intends to dig into the ground

must call the

PA ONE CALL SYSTEM

at least three days prior the start of digging!

Failure to call and secure a ONE CALL number may result in the penalties that are provided for by law.

811

Know what's below.
Call before you dig.

It's easy. Just dial 8 – 1 - 1 !