BAYSAVER DRIP™

Earth friendly wastewater systems

System Overview

The Baysaver Drip™ wastewater treatment system converts sewage from your residence or business into a clear, odorless liquid. This high degree of treatment is accomplished at a remarkably low operating cost per month. The system has been simplified over the years to make it as inexpensive to operate and as low in long term maintenance as possible. Homeowners who have lived with the nuisance of a septic odor lingering in their neighborhood will truly appreciate the pleasure of owning a Baysaver Drip™ System. The heart of the system consist of the Clearstream Model NC3T aerobic treatment plant. Treated effluent then passes through a mechanical spin filter during pumping. A microprocessor based pump controller provides a soft start feature to the submersible pump which delivers a timed dose of treated effluent to a shallow placed drip dispersal field for further treatment and nutrient uptake.

Treatment Process Description

The Clearstream Treatment System operates in the extended aeration mode of the activated sludge process. Wastewater enters the trash tank compartment through a 4" Sch. 40 PVC inlet pipe, this anaerobic chamber allows larger solids to settle before the wastewater enters the aeration chamber. Wastewater is then mixed throughout the aeration chamber by releasing compressed air near the bottom of the chamber through a fine bubble diffuser. The rising air bubbles transfer oxygen to the wastewater which allows aerobic organisms to thrive and ultimately decompose the incoming waste matter. The turbulence caused by the rising air bubbles also creates a mixing pattern which keeps the sludge in suspension. As incoming wastewater enters the aeration chamber, existing "mixed liquor" from the aeration chamber is displaced into the bottom of the cone-shaped clarifier. The clarifier chamber allows the water to still, so suspended solids in the "mixed liquor" can settle back into the aeration chamber for further biological breakdown. The remaining clear water in the upper zone of the clarifier chamber is then discharged by gravity through the surge control weir and out the 4" Sch. 40 outlet pipe to the pump chamber. The final effluent is then discharged to the drip dispersal field. When properly loaded and maintained, this process allows the Baysaver Drip™ Wastewater System to provide years of satisfactory service for the consumer. Clearstream Models NC3T systems meet the performance requirements of NSF Standard 40 Class I. Actual NSF test results averaged 5 mg/l BOD and 6 mg/l TSS.

System Status Alarms

The earlier systems have two audible-visual alarm boxes while the post 2012 units have just one. The Clearstream panel alarm indicates a failed compressor or a high level of sludge in the clarifier. The domed red light will illuminate and the alarm will sound. Press the alarm silence switch on the side of the panel. The newer systems have just the Aquaworx controller which covers all alarm conditions. In addition to a pump high-level alarm indicator, the indicator light located on the panel displays current system status information by illuminating the indicator light in unique patterns. These patterns are repeated every 8 seconds. The lack of any visual indicators for more than 8 seconds signals a hardware problem in the pump controller. The indicator light communicates the following system conditions:

On solid = The system is experiencing a high-water alarm condition
1 short flash = The system is idle and powered on.
1 long flash = The system is pumping
2 short flashes = The system is waiting for the off time to expire

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Operation and service guidelines

Introduction

The Aerobic Drip Irrigation System disperses treated effluent through drip irrigation tubing incorporating emitters placed some six to twelve inches below the soil surface. A small trickle of treated wastewater is pumped through the system every two to four hours and discharged uniformly over a specified area to facilitate soil absorption of the water and allow maximum reuse of the water by lawn and landscape plants.

Operation, Inspection and Maintenance

Every homeowner who installs an wastewater treatment system on their property will receive this Operations Manual, which outlines the operation and maintenance requirements of the pretreatment system. This Manual in conjunction with the construction plans on file at the local health dept. provides the names, and phone numbers of local service persons that can provide parts & service for the system.

Drip Irrigation System Routine and Preventative Maintenance

The maintenance program, as a minimum, should consist of the following activities:

1) Clean or replace the inlet air filter on the aeration compressor pump.

2) Remove the spin filter and clean or install a new screen cartridge. The filter cartridge should be washed with a pressure hose from the outside toward the inside. If all bacterial scum is not removed by washing, then replace the cartridge.

3) Check the drip field area for leaks or wet areas. If a leak is evident, repair as soon as possible. Note the condition of the field and any repairs made.

4) Inspect and maintain the pretreatment system as specified in the Owner's Manual.

5) Replace the back-up battery, download the pump counter, override counter, high-level alarm and power failure events. This information can be downloaded from the IPC pump controller onto a SD memory card.

• **If your highwater alarm should sound, press the silence button, the alarm light will remain illuminated as long as the alarm condition occurs. Find the source of the inflowing water (running toilet, too many wash loads in a row). If the light remains on longer than 2 hours call your service company. You have approximately one day of storage in the pump tank after the high water alarm sounds, so you should minimize water usage in the home or business (i.e., laundry) until the system has been checked.**

• If the air supply pump serving the aerobic treatment unit is out of service for any extended period of time (one or more days) solids may build up in the unit and pass into the pump tank and clog the fine screen filter. If this occurs, call your service company.

• If you notice any areas of excess wetness in the field, contact your service company. Such problems are usually minor in nature and easily repaired. Some initial wetness over the drip lines when the system is first installed is normal and should clear up once the soil has settled and a grass cover established over the field.

SERVICE

In order for the Clearstream System to function at optimum performance levels, the system will require periodic service. The recommended service schedule includes:

SERVICE TYPE	FREQUENCY
Repair or replace aerator	**2 to 10 years**
Clean air filters on aerator	**6 months to 2 years**
Clean spin filter on eff pump	**6 months**
Break up scum in clarifier	**6 months to 2 years**
Pump sludge from aeration tank	**2 to 5 years**
Pump sludge from trash trap	**2 to 5 years**
Check aeration diffuser	**annually**
Check Surge Control Weir	**6 months**
Replace back-up battery	**annually**

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For the first two years from the date of purchase, your local installer, from whom you purchased your Clearstream System, will provide warranty service for operational problems. Service on Clearstream electrical and mechanical components will be performed under warranty with only a charge for labor, if such components are found to be defective.

TO PREVENT MALFUNCTIONS OF YOUR SEWAGE SYSTEM, THE FOLLOWING GUIDELINES SHOULD BE FOLLOWED:

• Do not drive any heavy equipment, including cars or trucks, over the drip irrigation field. Light equipment, such as lawn mowers and garden tractors can be safely driven over the field.
• Do not drive stakes or any sharp objects into the ground greater than 5 inch depth anywhere in the drip field.
• Do not discharge any roof drains, sump pumps or other sources of extraneous water into the system. Fix all plumbing leaks to prevent excess water form entering the system.
• Try to equalize water usage in the house by spreading out laundry loads throughout the week instead of concentrating them in one or two days. Wash one warm water load for every cold water load in order to kept the micro-organisms at their peak health and population.

1. Any sewage treatment system, whether aerobic or septic, should not have inorganic materials (plastics, cigarette butts, condoms, throwaway diapers, etc.), which the bacteria cannot consume, discharged into the system.
2. Large amounts of harsh chemicals, oil, grease, high sudsing detergents, discharge from water softeners, disinfectants or any other chemical or substance that kills bacteria should not be discharged into the system. When shock chlorinating drinking wells the purge water should be directed through a outside faucet and not through the system. Garbage disposals are not recommended.
3. Excessive use of water, over the design flow of the system, will cause system not to perform to its fullest capabilities.
4. The proper operation of this or any other home sewage system depends upon proper organic loading and the life of the micro-organisms inside the system. Clearstream and ESVA is not responsible for the in-field operation of a system, other than the mechanical and structural workings of the plant itself. We cannot control the amount of harsh chemicals or other harmful substances that may be discharged into the system by the occupants of a household.

SERVICE POLICY DOES NOT INCLUDE LABORATORY ANALYSIS COST OR COST ASSOCIATED WITH PUMPING SLUDGE FROM THE UNIT IF NECESSARY.

Laboratory sampling requirements per 12VAC5-613-100.

Time in service	BOD_5 mg/L	Dissolved O_2 mg/L	Fecal Coliform Cfu/100mg
First 180 days	Yes	No	If unit has UV disinfection
Every 5 Years	Yes	Yes	If unit has UV disinfection

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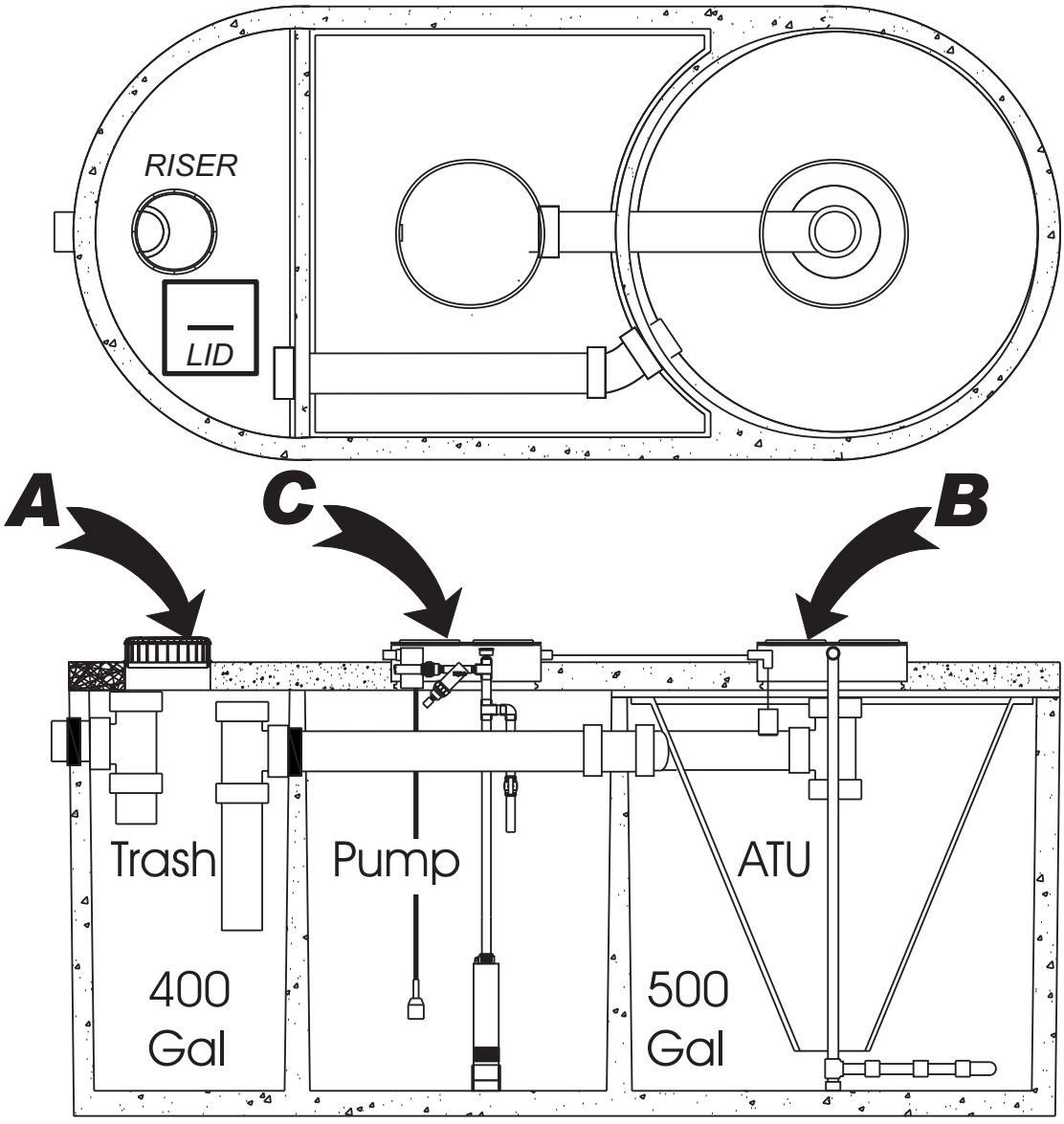
NC3T PUMP-OUT INSTRUCTIONS:



Pump tank "A" completely to remove all solids and FOG ~400 gal. Lid may be a riser or buried hatch lid as shown.
Pump tank "B" enough to remove the sludge layer from the bottom of the tank. Do not remove more than half the liquid. Insert hose into and below the clarifier cone.
Tank "C" will not normally need pumping unless there is sediment or carry-over sludge from the ATU.
Note: Some ATU's will contain loose ring media (3.5" dia.). Use a 3 " hose to avoid removing media.

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