



Aerobic Treatment Unit Installation and Maintenance Training

500-1500 gpd

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5.5 hrs.

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Process Description (.25 hrs)

The NUWATER Wastewater Treatment System is designed for treating domestic wastewater generated by normal household activities. The system consists of a single tank utilizing the extended aeration activated sludge process . The system is capable of producing an effluent which meets or exceeds applicable state discharge standards. This system has been successfully tested in accordance with National Sanitation Foundation (NSF) Standard 245.

Wastewater from the home flows into the pretreatment zone of the system. Here, the organisms begin to breakdown and convert the waste into gases and additional microbes. This is also where nitrate is converted to nitrogen gas. The partially broken down waste then enters the treatment area, or aeration chamber. In the treatment area waste is continually exposed to microbes for the remainder of the treatment process. The action of the aerobic microbes results in a lower concentration of pathogenic bacteria. After sufficient time in the aeration zone, the mixture enters the clarifier where calm conditions enable separation of microbes, solids, and treated wastewater. The microbes that settle out of the water are returned to the aeration chambers where they are again beneficial in wastewater treatment.

The result of aeration and quiescent separation is an effluent that is clear, odorless, and low in nutrients which may be discharged according to local health regulations. The NUWATER Wastewater treatment system is available in concrete, asphalt coated steel, and polyethylene. Materials are subject to state approval.

Definitions (.15 hrs.)

The following words and terms, when used in this text, shall have the following meanings.

Aerobic digestion- bacterial decomposition and stabilization of sewage in the presence of free oxygen.

Alter- The use of components from any other system or configuration not authorized by NSF International or Enviro-Flo, Inc..

Anaerobic digestion-bacterial decomposition and stabilization of sewage in the absence of free oxygen.

Discharge-To deposit, conduct, drain, emit, throw, run, allow to seep, or otherwise release or dispose of.

Holding Tank-A water tight container used to receive and store sewage pending its delivery to an approved treatment process.

Installer-An individual who is compensated by another to construct an OSSF.

Maintenance-Required or routine performance checks, and upkeep of components without alterations to an OSSF.

On-Site Sewage Facility (OSSF)-A system that is used only for sewage produced on a site where any part of the system is located.

Pretreatment Tank-A tank placed ahead of a treatment unit that functions as an interceptor for foreign materials that are potentially harmful to the treatment unit components.

Sewage-Waste that is primarily organic and biodegradable or decomposable; and originates as human, animal, or plant waste from certain activities, including use of the toilet facilities.

Sludge- A semi liquid mass of partially decomposed organic and inorganic matter which settles at or near the bottom of a receptacle containing sewage.

Soil- The upper layer of the surface of the earth that serves as a natural medium for the growth of plants, and microbes.

Installation of Components (.25hrs) see figure 1.1

Before any component of the system is installed inside of the unit; they should be carefully inspected for damage or defects. Never install damaged components inside of the treatment system. All air connections should be made with 1" PVC schedule 40 pipe. Only 4" schedule 40 pipes should enter and exit the unit until undisturbed soil is reached. All components should be connected using approved PVC cleaner and cement. The system consists of precut air diffusers, an air distribution manifold/ high water float, and a wastewater clarifier tee assembly. The air diffusers are designed to be installed in the air chamber. The diffuser is to be connected in the treatment chamber. The diffuser should be extended to the bottom of the treatment unit. The diffuser connects, via PVC, to the air distribution manifold/ high water float. 1" PVC is extended from the air distribution manifold to the location of the aerator. The effluent/ discharge pipe is extended inside the treatment unit 4" maximum. The wastewater clarifier tee assembly is connected inside of the unit to the discharge pipe. The clarifier tee assembly should be vertical and level for correct operation. The Aerator and alarm control panel should be installed in areas where their function will not be hindered.

Replacement of Components (.25 hrs.)

Components should be carefully inspected before replacement. Never install damaged components. Replace components only with factory provided replacements. Make sure power is disconnected before service begins. Aerators, diffusers, and high water floats require no tools for replacement. Clarifier tee assemblies and PVC pipe shall be connected using approved cleaner and cement. Components shall be replaced in the same manner as the original installation.

Installation of the System (.50 hrs.)

Read the equipment parts list provided in the owner's manual and verify that all required parts are on site. Decide on an appropriate location for the plant which is accessible to the home sewer outlet. Excavate a site which is approximately 1' larger than the treatment plant that will allow proper coverage of the system. The building sewer outlet will determine the depth of the plant. Make sure you have a smooth level surface for the base of the unit. The tank must be placed on sand, sandy loam, clay loam or pea gravel, free of rock larger than 1/2 " diameter. The dual port linear blower should be no more than 50' away from the plant and in a well ventilated area. Place the unit into the excavated site. Carefully backfill around the unit, compacting the soil as well as possible, leaving the inlet and outlet holes open for connections. Connect the influent end to the building sewer outlet. Connect the appropriate discharge to the effluent end of the plant. Inlet and outlet pipes should extend at least 3" into the system. Connect the clarifier tee to the effluent pipe inside the unit making sure it is in the level vertical position. Place the diffuser approximately 3" from the front edge of the treatment chamber. Diffusers should relax on the base of the unit, without stress to the fittings. Install the blower in a dry location no more than 50' away from the treatment unit. Connect 1/2" PVC from the blower to the air distribution manifold and the recirculation pump. Make sure the pipe is stable and resting on the excavated surface as opposed to hanging. Install electrical components in accordance with local electrical codes, in a dry place. Fill the unit to the level of the effluent discharge. Turn on all electrical components and verify that there are no leaks, air or water, throughout the system. If a leak is detected, repair and retest. After determining all connections are correct, carefully backfill the excavated site. The first 4" of backfill around and on top of the tank is to be the same as the backfill under the tank. Visually inspect all above ground connections.

Wiring (.10 hrs.)

All electrical wiring shall conform to the requirements of the National Electric Code (1999) or under any other standards approved by the executive director. All external wiring must be installed in approved, rigid, non-metallic gray code electrical conduit.

Start up (.10 hrs.)

Initially the NUWATER system is filled with clean water, usually from the homeowner's water supply. As stated in the installation instructions, once all the proper connections have been completed and it is filled with water, the aerator is turned on. The system is now in operation. For the treatment plant to become biologically stable, it will take four to sixteen weeks after first using the system to establish a population growth of microbes. It is microbes which make the system operate properly.

Discontinued Service (.10 hrs.)

If the unit is to be removed from service; it is suggested to leave the effluent in the system. This will prevent unusual stress to the unit due to outside pressures. A cap should be placed on the inlet pipe to prevent water from entering the system. If the system is to be completely abandoned it is recommended that the unit be pumped out and removed or filled with appropriate materials less than 3" in diameter.

System Restart (.25 hrs.)

If the system has been removed from service for less than 120 days; restart is accomplished by the addition of enzymes and bacteria provided by the manufacturer. For systems that have been discontinued for greater lengths of time it is suggested to have the system pumped and the air stones cleaned before restart.

Surface Application (Where Applicable) (.50 hrs.)

Surface application systems include those systems that spray treated effluent onto the ground. Land that is used for growing food, gardens, orchards, or crops that may be used

for human consumption, as well as unseeded bare ground, shall not be used for surface application. Treated effluent must be disinfected before surface application. Approved disinfection methods shall include chlorination, ozonation, ultraviolet radiation, or other methods approved by the executive director. The minimum required application area required shall be determined by utilizing 30 TAC 285.33(d)(2)(E) or as approved by the permitting authority. All new distribution piping, fittings, valve box covers, and sprinkler tops shall be permanently colored purple to identify the system as a reclaimed water system. Distribution pipes, sprinklers, and other application methods or devices must provide uniform distribution of treated effluent. The application rate must be adjusted so that there is no runoff. The maximum inlet pressure for sprinklers shall be 40 psi. Low angle nozzles shall be used in the sprinklers to keep the spray stream low and reduce aerosols. A single pump may be used for flows equal to or less than 1000 gallons per day. Dual pumps are required for all applications exceeding 1000 gallons per day. All pumps shall be rated by the manufacturer for pumping sewage or sewage effluent. All electrical wiring shall conform to the requirements the National Electric Code (1999).

Pump Tanks (.25 hrs.)

When effluent must be pumped to a disposal area, an appropriate pump shall be placed in a separate watertight tank or chamber. The pump tank shall be equipped to prevent siphoning. Pump tanks controlled by a commercial irrigation timer and required to spray between midnight and 5:00 a.m., there shall be at least one day of storage between the alarm-on level and the pump-on level, and a storage volume of one third the daily flow between the alarm-on level and the inlet to the pump tank. For systems not controlled by a commercial irrigation timer, the minimum dosing volume shall be at least one-half the daily flow, and a storage volume of one-third the daily flow between the alarm-on level and the inlet to the pump tank.

Trouble Shooting (.50 hrs)

System has offensive odor.

Check list and assure that no chemicals listed have been permitted to enter the system.

Check for proper operation of the aerator including a restricted filter (see system not

aerating.) Check for standing effluent that fails to run off or evaporate; it is possible for standing effluent to become stagnant. Check to see if the system has been pumped within the required time. Check water level to ensure it is not above the level of the baffle allowing solids to enter the clarifier chamber.

Aerator is not working.

Check for proper wiring connections. Check circuit breakers for failure. If the prior remedies are not sufficient replacement might be necessary.

System is not aerating.

Check aerator for operation. Check aerator filter element for restrictions. Visually check air line and diffusers for broken connections or restrictions. Check aerator pressure output using a standard low pressure gauge and compare to manufacturer's specifications. (see figure 2.)

Audible/visual alarm sounds.

Check water level. Verify that the aerator is working. Check for dislocated air lines. Make sure tank is at least half full of water to create back pressure. If all appears normal alarm may need replacing.

Aerator is loud.

Linear compressors are made to function quietly. If the following remedies do not correct the problem the aerator may need replacing. Check for vibrations against solid structures. Check filter cover for proper torque.

Responsibilities of Installers (.25 hrs)

An installer shall possess a current Installer license before beginning construction of an OSSF. The installer shall record his/her license number on all bids, proposals, contracts, invoices, or other correspondence with owners, the executive director, or authorized

agents. The installer must provide true and accurate information on any application or any other documentation. It is the installer's responsibility to notify the permitting authority of the date on which he plans to begin the construction of an OSSF, unless a permit is not required. Installers must construct an OSSF to meet the minimum criteria as required by TCEQ. Installers shall only install that which has been authorized by the permitting authority for the specific location in question. The installer is responsible for requesting the initial, final, and any other inspections from the permitting department. The installer must be present at the job site during construction of the OSSF or be represented by an apprentice. The installer or maintenance company must perform maintenance, keep a maintenance record, and submit maintenance reports to the permitting authority and the owner of an OSSF for which the installer/ maintenance company has contracted to provide maintenance. It is the installer's responsibility to record owner's name, address, inspection dates, and serial number as required by NSF International.

Maintenance Contract Requirements (.25 hrs)

The installer of an OSSF shall provide the owner of the system with information regarding maintenance of the system at the time the system is installed. The maintenance contract shall specify the following:

- List items that are covered by the contract;
- Specify a time frame in which the maintenance company will visit the property in response to a complaint by the property owner regarding the operation of the system;
- Specify the name of the individual employed by the maintenance company who is certified by the manufacturer of the system;
- Identify the frequency of routine maintenance and the frequency of the required testing and reporting; and
- Identify who is responsible for maintaining the disinfection unit.

Local permitting authorities may implement additional requirements or restrictions on home owner maintenance.

Amending or terminating maintenance contract. (.10 hrs.)

If the owner of the on-site sewage disposal system enters into a new maintenance contract or revises the original maintenance contract, the owner must submit a copy of the new or revised maintenance contract to the permitting authority not later than the 30th day after the date on which the original contract terminates or is modified. If a maintenance contract is terminated the owner shall contract with another maintenance company and provide the permitting authority with a copy of the new-signed maintenance contract no later than 30 days after termination. If the maintenance company wishes to terminate to maintenance contract they shall provide at least 30 days written notice to the homeowner and appropriate authorities. If the cancellation occurs within 2 years of the installation, the system manufacturer shall be notified.

State Requirements while conducting maintenance (.10 hrs.)

Individuals shall be certified by the manufacturer, or by a certified representative of the manufacturer, for any OSSF being maintained. The maintenance company or the individual certified by the manufacturer will be responsible for fulfilling the requirements of the maintenance contract. The initial written maintenance contract shall be effective for at least two years from the date the OSSF is first used. For a new single family dwelling, this date is the date of sale by the builder. For an existing single family dwelling this date is the date the notice of approval is issued by the permitting authority. After the expiration of the two-year initial maintenance contract, the owner shall have on-going maintenance performed by either themselves or a certified maintenance company qualified to provide the owner with a record of the maintenance check. The maintenance company shall install a weather resistant tag, or some other form of weather resistant identification, on the system at the beginning of each maintenance contract. This identification shall:

- (A) identify the maintenance provider
- (B) list the telephone number of the maintenance provider
- (C) specify the start date of the contract; and
- (D) be either punched or indelibly marked with the date the system was checked at the time of each maintenance check, including any maintenance check in response to owner

complaints. The number of required tests may be reduced to two per year for all systems having electronic monitoring and automatic telephone or radio access that will notify the maintenance company of system or components failure and will monitor the amount of disinfection in the system. The maintenance company shall be responsible for ensuring that the electronic monitoring and automatic telephone or radio access systems are working properly.

The maintenance provider shall state an estimated cost in the written notification of a problem observed during a maintenance check.

Failing to comply (.25 hrs.)

Failure to comply with the responsibilities will result in suspension or revocation of license or registration. The executive director may suspend a license for the following reasons. The installer or maintenance personnel failing to perform required maintenance on an on-site sewage facility (OSSF), for at least eight consecutive months. Failing to maintain records is evidence of failure to perform maintenance on the OSSF; failing to properly submit maintenance reports for an individual OSSF in a 12-month period; or failing to properly submit four or more required OSSF maintenance reports over any two-year period.

Testing and reporting requirements (.25 hrs.)

The maintenance company or the owner, if the owner decides to maintain the OSSF personally as allowed, shall test and report for each system as required. The report shall include any responses to owner complaints, the results of the maintenance company's findings, or the owner's findings, and the test results. The report shall be submitted to the permitting authority and the owner within 14 days after the date the test is performed. For required testing requirements please refer to 30 TAC 285.7(e)

Homeowner training (.25 hrs.)

If the owner elects to maintain a system directly, the owner shall, before performing any maintenance, obtain training for the system from an installer, or certified representative, who has been certified by the manufacturer. At least 30 days before the expiration of the maintenance contract, the owner must provide the permitting authority a written statement, signed by the installer, stating that the owner has been trained to maintain the system. In the absence of a maintenance contract, the owner is responsible for maintenance, testing, and reporting results to the permitting authority.

Home owner responsibilities (.25 hrs.)

It is the owner's responsibility to operate the NuWater system to the best of their ability. To ensure proper operation the following precautions should be noted.

Do not allow nest buildup around aerator or other components. Maintain grass and shrubs around the system. Restrict automotive travel over treatment unit. Never allow unapproved items to enter the system such as:

- (a) Products high in phosphates; (ex. Some detergents and dishwashing liquids.)
- (b) Non- biodegradable items; (ex. Diapers, condoms, tampons, cigarette butts etc.)
- (c) Concentrated cleaning agents; (ex. Carpet shampoo waste)
- (d) Highly toxic chemicals; (ex. Acids, hair treatment chemicals, insecticides, etc.)
- (e) Large quantities of grease or lard.
- (f) Large amounts of hair.
- (g) Concentrated chlorine or disinfectants; ex (toilet bowl tablets etc.)
- (h) Discharge from a water softener (see below)

Effective April 28, 2004, discharge from a water softener installed on or after September 1, 2003 may be discharged into an on-site sewage facility as provided

- (a) The water softener must regenerate using a demand – initiated regeneration (DIR) control device. The water softener must be clearly labeled as being equipped with a DIR control device.
- (b) The water softener should bypass the treatment system; and connect directly to the pump tank is available. If no pump tank is available the softener should connect to the pipe between the treatment system and the disposal system

System parts and manuals (.10 hrs.)

System parts and manuals should only be ordered from the manufacturer or authorized state representative. Never purchase or install aftermarket of equivalent parts. Only factory authorized parts are covered under NuWater's certification and warranty.

Contacts (.5hrs.)

For concerns about system performance or operation contact the NuWater Headquarters at the following location

Enviro-Flo, Inc.
PO Box 321161
Flowood Ms. 39232
1-877-836-8476

Post In A Service/Utility Area

NUWATER TREATMENT SYSTEMS

NOTICE

An Individual Wastewater Treatment System serves this home. This system will serve you well only if it is properly maintained. Your system is comprised of

Your system is located _____.

You should not build or fill over this area, or allow heavy traffic. Do not allow water to stand over this area, avoid using strong chemicals, cleaning fluids, etc., which will kill helpful bacteria in the system. You should also avoid flushing grease, food scraps, cigarette butts, sanitary napkins, and other inorganic waste down the drain.

You should have your system serviced (pumped out) every 3 to 5 years. Your service technician can advise you if you need more frequent or additional service.

To have your system serviced, or for additional information, call _____ at _____.

All of the details regarding system operation can be found in your homeowner's manual which you should have received at installation. If you did not receive a copy call 1-877-836-8476 and we will send you one at no charge.

Keep A Record Of Service Below:

DATE	SERVICE PERFORMED	SERVICE TECHNICIAN

Enviro-Flo Inc. Wastewater Treatment Technologies. P.O. Box 321161 Flowood Ms. 39232

THE FOLLOWING SHOULD NOT BE DISPOSED INTO THE SYSTEM

- Greases, Fats and Oils – Pesticides, Herbicides, or any other toxins.
- Garbage disposal should be used sparingly. Dispose of food waste, grease, etc., in the solid waste bin. Food waste represents additional loading the Aerobic Treatment Plant would have to digest, increasing pump out intervals.
- Paints, household chemicals – automobile fluids – do not discard mop water into the system.
- Non-Biodegradable items such as cigarette butts, disposable diapers, feminine hygiene products, condoms, hair, coffee grounds, rags, paper towels, bandages, etc.

- Wash loads must be spread out over the week. Once a week multiple loads or half loads are not recommended.
- Citrus products, oranges, lemons, grapefruit, etc.
- Additives for septic systems – they do no more harm than good.
- Hydraulic overload due to excessive water from other sources.
- Home Brewery Waste – Strong Medicines, Antibiotics. Anti-Bacteria Soaps should be avoided.
- Strong disinfectants or bleaches. Laundry products such as: Lysol, Pine-Sol, Tidy Bowl, or discharge from water softeners, Drano.
- Recommended detergents are: powdered, low-sudsing, low phosphates and biodegradable, washing soda ingredients such as Gain, Arm & Hammer, Fresh Start, and Dash Bright. Fabric softener dryer sheets are recommended.
- Recommended cleaning products are: Non-chlorine, biodegradable and non-toxic such as Ivory & Sunlight dish washing liquids, Cascade & Sunlight powdered dishwasher detergents, Comet & Biz powdered cleaners, baking soda.

Systems requiring pump outs due to the above violations are not covered by the warranty.

Maintenance Contract

With installation you have 2 years free warranty/service checks on your aerobic plant occurring on 6 month intervals. We are offering extended maintenance checks/service beginning after installation extending to an agreed specified time. All owners of aerobic systems should maintain a factory authorized service provider for the lifetime of the system. Although aerobic systems require continuing maintenance, they are and will continue to be the most efficient method of sewage disposal.

All maintenance requirements shall be addressed within 24 hours of complaint. The system shall be inspected on 6-month intervals unless shorter durations are required due to excessive loading. Maintenance shall consist of a complete system inspection including: filters, warning devices, electrical controls, aeration, disinfection, and effluent clarity. Disinfection units are to be charged by the homeowner unless otherwise arranged with the maintenance provider. Only wastewater grade chlorine or UV radiation should be used to disinfect system effluent.

The following testing requirements and frequencies are to be followed as stated in TAC Chapter 285 Table IV.

Type and Size of Treatment Unit	Testing Frequency	Required Tests	Minimum Acceptable Test Results
Any Treatment Method in Conjunction with Surface Application	At least once every four months	One BOD ₅ and TSS Grab Sample Per Year (non-single family residences only) Total Chlorine Residual or Fecal Coliform at Each Required Test	BOD ₅ and TSS Grab Samples Not To Exceed 65 mg/l 0.1 mg/l Residual in Pump Tank or Fecal Coliform Not To Exceed 200 MPN/100 ml (CFU/100 ml)
Any Secondary Treatment System	At least once every four months	None	None
Non Standard	Permit Specific	Permit Specific	Permit Specific

If maintenance is to be discontinued, we are required, in writing, to notify the permitting authority, manufacturer, and you, (homeowner) at least 30 days before the date service will cease.

If this maintenance contract is discontinued or terminated, you (homeowner), shall contract with another maintenance company and provide the permitting authority with a copy of the new signed maintenance contract no later than 30 days after termination.

This service agreement will be _____ prepaid yearly. If any additional labor or extra parts are used on your aerobic plant, there will be an additional charge to you (the homeowner).

Homeowner _____ Model # _____ Id# _____

Address _____ City _____ Zip _____ Phone _____

Installation Date _____ Installer _____

Maintenance Provider License # _____

Signature

Date

Maintenance Provider

Contract Expiration

