

**NORTH CAROLINA DEPARTMENT OF HEALTH AND HUMAN SERVICES
DIVISION OF PUBLIC HEALTH
ENVIRONMENTAL HEALTH SECTION
ON-SITE WATER PROTECTION BRANCH**

INNOVATIVE WASTEWATER SYSTEM APPROVAL
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Innovative Wastewater System Approval Number: IWWS 2015-03-R4

Issued To: E-Z Treat Company
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For: E-Z Treat Model 600 Pretreatment Systems

Approval Date:	April 24, 2015	
	June 15, 2015	Tank Size and Sampling Revisions
	January 6, 2017	Addition of Single Bulb UV Unit
	January 31, 2024	Modification to Tank Sizes and Addition of NSF/ANSI Standard 350 and Reduction to Property Line
	December 31, 2024	Renewed for 2025

In accordance with G.S. 130A-343 and 15A NCAC 18E Section .1700, an application by E-Z Treat Company for a renewal of the approval for their advanced pretreatment system has been reviewed and found to meet the standards of an Innovative system when the following conditions are met.

I. General

A. Scope of this Innovative Approval

1. Design, installation, use, and operation and maintenance guidelines for E-Z Treat Pretreatment systems to meet TS-I and TS-II effluent standards pursuant to Rule 15A NCAC 18E .1201(a), Table XXV.
2. Operation, maintenance, and monitoring requirements for E-Z Treat Pretreatment systems and associated dispersal fields to ensure the treatment performance standards are met.

B. This Innovative System Approval is applicable to wastewater systems treating domestic strength effluent, as defined in 15A NCAC 18E .0402(a), Table III, utilizing E-Z Treat Pretreatment systems that have a design daily flow not exceeding 3,000 gallons per day (gpd).

Use of E-Z Treat Pretreatment systems for facilities with high strength effluent, as defined in 15A NCAC 18E .0402(a), Table III or industrial process wastewater, shall be proposed by E-Z Treat Company and a North Carolina Professional Engineer (PE) to the Department for review and

approval on a case-by-case basis, prior to permitting by the local health department (LHD). The system design shall include the proposed raw wastewater strength (BOD₅, COD, TN, TSS, and fats, oils, and grease, the expected organic loading rate (in pounds of BOD), and hydraulic loading rate on the pretreatment system, and the calculations, references, and any other needed information to support the proposed design.

- C. Any site utilizing these systems shall have wastewater with sufficient alkalinity to facilitate biological treatment processes. The influent shall not have a pH or toxins that significantly inhibit microbial growth.
- D. Use of E-Z Treat Pretreatment systems that have a design daily flow exceeding 3,000 gpd may be permitted after approval by the Department on a case-by-case basis in accordance with 15A NCAC 18E .0302(e) or G.S. 130A-336.1.

II. System Description

The E-Z Treat Pretreatment system consists of the following components: a Department approved septic tank; a recirculation tank (or chamber); single or multiple E-Z Treat Pretreatment pods; and a final dosing tank (or chamber). Additional treatment may be used to ensure that treatment performance standards shall be met.

The E-Z Treat Pretreatment system can utilize either a two tank configuration or a three tank configuration. The two tank configuration has the following components: the first tank is a septic tank and the second separate tank has a recirculation chamber and final dosing chamber. The three tank configuration consists of three separate tanks: a septic tank, a recirculation tank, and a final dosing tank.

III. Siting Criteria

The E-Z Treat Pretreatment systems and associated dispersal fields shall be sited and sized in accordance with 15A NCAC 18E Section .1200 for TS-I and TS-II systems. Drip irrigation systems used with E-Z Treat Pretreatment systems shall be sited and sized in accordance with 15A NCAC 18E .1204 and the manufacturer specific drip approval. The E-Z Treat Pretreatment systems and associated dispersal fields shall meet all applicable horizontal setback requirements in accordance with 15A NCAC 18E Section .0600 and be located to prevent surface and subsurface water inflow and infiltration.

IV. Dispersal Field System Sizing

The dispersal field system sizing criteria shall be based upon the long-term acceptance rate specified in the appropriate portion of the rules or the Provisional, Innovative, or Accepted system approval for the type of dispersal system to be used.

V. Special Site Evaluation

A special site evaluation may be required based on the proposed dispersal system. Refer to 15A

NCAC 18E .0510(c) for when a special site evaluation is required.

VI. Design Criteria

- A. The E-Z Treat Pretreatment system shall be designed in accordance with the following criteria.
1. All septic, recirculation, and dosing tanks must be approved by the Department and E-Z Treat Company specifically for use with the E-Z Treat Pretreatment system.
 2. The E-Z Treat Pretreatment system can utilize either a two tank configuration or a three tank configuration. The two tank configuration has the following components: the first tank is a septic tank and the second separate tank has a recirculation chamber and final dosing chamber. The three tank configuration consists of three separate tanks: a septic tank, a recirculation tank, and a final dosing tank.
 3. The E-Z Treat Pretreatment system consists of a septic tank, a recirculation tank/chamber, a final dosing tank/chamber, and E-Z Treat media pod(s) as specified in Table 1 below.

Table 1 – Model 600 and Tank Volumes			
Design Daily Flow (gpd)	Minimum Septic Tank Volume (gallons)	Minimum Recirculation/Pump Tank Volume (gallons)**	Number of Media Pods
< 480	1,000	1,250	1 Model 600 pod
4 Bedrooms	1,000	1,500	1 Model 600 pod
5 Bedrooms	1,250	1,850	1 Model 600 pod
6 Bedrooms	1,500	2,200	2 Model 600 pods
601 – 1,500	$V = 1.17Q^* + 500$	$V = 1.17Q + 500$	1 Model 600 pod per 600 gallons
1,501 – 3,000	$V = 0.75Q + 1,125$	$V = 0.75Q + 1,125$	1 Model 600 pod per 600 gallons

*Q – design daily flow

**Recirculation/pump tank minimum size based on total internal tank volume.

4. Septic tanks will have an inlet sanitary tee and a Department approved, appropriately sized effluent filter on the outlet end approved by the E-Z Treat Company for use with the E-Z Treat Pretreatment system.
5. The minimum required volume in the recirculation chamber/tank prior to discharge to the dosing tank/chamber shall be the design daily flow.
6. The recirculation tank/chamber will contain the recirculating splitter valve or an external splitter box may be used. The recirculation tank/chamber shall have an inlet sanitary tee. The sanitary tee shall be visible and reachable from the riser opening to serve as the influent sampling point.
7. When the recirculation tank and dosing tank are combined, the baffle wall between chambers shall extend to the top of the tank and shall be constructed so that the liquid levels in either compartment are independent. Liquids will not by-pass between compartments except as designated by the system’s treatment flow path.
8. The final dosing tank must meet the minimum size requirements of 15A NCAC 18E .0802. For drip irrigation systems, the pump tank shall be sized in accordance with 15A NCAC 18E

.1602(b).

9. A drainback configuration without a pump check valve is required for the force main supplying the media pod.
10. The recirculation pump shall be either Sta-Rite Model number STEP 20 or manufacturer approved equal.
11. The E-Z Treat media pod is constructed of a polymer suitable for use in contact with wastewater. The Model 600 pod is approximately seven feet four inches by four feet with a surface area approximately 30 square feet and is 42 inches in depth. The pod is fitted with a weatherproof cover properly secured. The pod is designed and constructed to create channels down the sidewalls to facilitate air flow. The sidewall channels provide airspace to the bottom of the pod. The bottom of the vessel is designed to provide total drainage of the treated effluent back to the recirculation tank/chamber.
12. As the effluent enters the recirculation tank/chamber, this tank/chamber acts to further separate the septic tank effluent. The effluent entering the recirculation tank/chamber is charged by the recirculation pump to the media pod(s). The effluent is sprayed over the media mattress(es) using a spray manifold of evenly spaced wide-angle spray nozzles. The nozzles are manufactured with a free passage of 0.0625 inches in diameter. The system is set to recirculate effluent through the media pod on an average of four to six times prior to discharge.
13. The effluent is sprayed on mattress(es) measuring a total area of 30 square feet. The mattress(es) are fabricated from a non-biodegradable, chemically resistant, loose weave polypropylene material. The openings in the weave allow for effluent and air flow while containing the media. The media inside the mattress(es) are made of a styrene material. The specific gravity of this material meets the following criteria: light enough to prevent compaction which results in a loss of effective surface area and provides a reduction in channeling or short circuiting across the media.
14. Effluent passes through the media and enters a Schedule 40 pipe located at the bottom of the pod. The effluent than gravity feeds back to the recirculation tank/chamber and the process is repeated.
15. The effluent bypass valve or splitter box is piped to intercept filtered wastewater and deliver it to the recirculation tank/chamber or the dosing tank/chamber, based on liquid volumes.
16. The Control Panel for the E-Z Treat System will consist of recirculation pump on/off timer, discharge pump alarm, and high/low water alarm. Control panels shall meet the requirements of 15A NCAC 18E .1103 and shall be approved in writing by E-Z Treat Company for use in their systems.
17. Separate control and alarm circuits will be provided. The E-Z Treat systems will utilize a device for the automatic measurement and recording of daily flow to the dispersal field in accordance with 15A NCAC 18E .1702(a)(2)(I). This information will be stored in the data logger for drip irrigation systems (provided by the manufacturer of the drip irrigation control panel). For pressure manifold and LPP systems, the manufacturer shall approve the control panel in writing. The operator authorized in writing by E-Z Treat Company (authorized operator) must be able to access the panel directly on site and shall be available to the LHD with 24-hour notice in the event a direct connection is necessary.
18. The UV disinfection system shall be rated for the appropriate discharge rate from the E-Z Treat pod. The UV disinfection system will be one of the following:
 - a. E-Z Set UV-101 (single bulb);

- b. E-Z Set UV-202 (dual alternating bulbs); or
 - c. Other UV systems specifically approved by the Department and E-Z Treat Company.
19. All access riser hatches shall be secured by approved tamper-resistant hardware approved by the manufacturer or by other means approved by the manufacturer as equal. Riser construction, attachment to tanks and security systems shall be pre-approved by the Department and E-Z Treat Company in accordance with the E-Z Treat specific approvals for the septic tanks and pump tanks, as applicable.
20. Buoyancy calculations shall be completed by a PE if any parts of the tanks, pods, or other system components are installed in a seasonal high-water table. Additional ballast may be required.
21. Influent samples shall be taken from the inlet sanitary tee into the recirculation tank. Effluent samples shall be taken from the final pump dosing tank or a spigot or sampling port that is placed on the force main from the final dosing tank.
22. The property line setback in Group I soils may be reduced to five feet for the wastewater system when the proposed design configuration meets all of the following requirements:
- a. is designed by a PE;
 - b. has been certified by NSF International to meet NSF/ANSI Standard 350;
 - c. meets TS-II in accordance with 15A NCAC 18E .1201(a), Table XXV; and
 - d. meets a standard of Nitrate (as N) of 10 mg/L and Nitrite (as N) of 1 mg/L.
- The system shall be sampled for the above constituents in accordance with 15A NCAC 18E .1302 and .1709.
- B. E-Z Treat Pretreatment systems shall be designed by a designer authorized in writing by E-Z Treat Company (authorized designer) or a PE. Systems over 1,000 gpd shall be designed by a PE.

VII. Installation and Testing

- A. A preconstruction conference shall be required to be attended by the following, as applicable: authorized designer, Authorized On-Site Wastewater Evaluator (AOWE), PE, installer authorized in writing by E-Z Treat Company (authorized installer), E-Z Treat Company licensed distributor, and LHD prior to beginning installation of the E-Z Treat Pretreatment system.
- B. All E-Z Treat Pretreatment systems shall be installed according to directions provided by E-Z Treat Company.
- C. All individuals or companies installing E-Z Treat Pretreatment systems shall be in possession of all necessary permits and licenses before attempting any portion of a new or repair installation. The company or individual must be a Level IV installer and authorized in writing by E-Z Treat Company.
- D. Watertightness of the tanks shall be tested by either of the following protocols: 24-hour hydrostatic test or a vacuum test.

1. Hydrostatic Test
 - a. Temporarily seal the inlet and outlet pipes.
 - b. Fill tank with clean water to a point at least two inches above the outlet pipe connection.
 - c. Measure the water level.
 - d. Allow the tank to sit for 24 hours.
 - e. Re-measure the water level.
 - f. If the water level change is ½-inch or less or one percent of the liquid tank capacity, the tank passes the leak test.
 - g. If the water level change is greater than ½-inch, any visible leaks can be repaired and the tank may be topped off with water and allowed to sit for a minimum of one hour.
 - h. The tank passes the leak test if there are no visible leaks (flowing water or dripping in a steady stream) and no measureable drop in water level after one hour. Otherwise, the tank fails the leak test.
2. Vacuum Test¹
 - a. Temporarily seal the inlet and outlet pipes.
 - b. A vacuum of four inches of mercury should be pulled on the tank and held for five minutes.
 - c. During the testing, the tank manufacturer or their representative can seal the tank if it is found to be leaking.
 - d. If the tank is repaired, the vacuum must be brought back up to four inches and held for five minutes.

- E. The authorized installer, PE, AOWE, or authorized designer, and the authorized operator shall conduct a final inspection and start-up of the E-Z Treat Pretreatment system and all associated system components. The LHD will attend and observe the final inspection and start-up.
- F. Specified site preparation steps and construction specifications for the dispersal system shall be strictly adhered to, including specified depth of trenches in relation to site limiting conditions, cover material specifications (if needed), trench installation method, etc.

VIII. Operation, Maintenance, Monitoring, and Reporting

- A. E-Z Treat Pretreatment systems shall be classified, at a minimum, as a Type Va system in accordance with 15A NCAC 18E .1301(b), Table XXXII. Management and inspection shall be in accordance with 15A NCAC 18E, Section .1300.
- B. All E-Z Treat Pretreatment systems require an operation and maintenance agreement between the system owner and E-Z Treat Company, Inc., its authorized representative, or with an authorized operator in accordance with 15A NCAC 18E .1302(c). The authorized operator must have proper equipment and training to access and program the control panels on site. The authorized operator shall be:
 1. a North Carolina certified subsurface operator (Operator in Responsible Charge); and
 2. either an employee of E-Z Treat Company, Inc., or authorized in writing by E-Z Treat Company, Inc.

¹ National Precast Concrete Association, *Best Practices Manual Precast Concrete On-Site Wastewater Tanks*, Second Edition, October 2005, 24.

- C. All E-Z Treat Pretreatment systems shall be operated and maintained according to the latest version of E-Z Treat Company's O&M manual.

- D. At each E-Z Treat Pretreatment system inspection the authorized operator shall follow service procedure steps identified in the E-Z Treat Company, Inc., O&M Manual and, at a minimum, observe, monitor, and record the following:
 - 1. Wastewater level in all the tanks.
 - 2. Sludge, scum, and grease levels in all the tanks.
 - 3. Clogging of effluent filter.
 - 4. Watertightness of tanks, risers, and pipe penetrations at the tanks.
 - 5. Operation of pumps, floats, valves, electrical controls, and alarms.
 - 6. Dispersal field pump delivery rate (drawdown test), determination of the average pump run time, and dispersal field dosing volume.
 - 7. Any structural damage, accessibility issues, adequate ventilation, excess odors, ponding of effluent, insect infestations, vegetative growth over the dispersal field, or surfacing of effluent on the dispersal field.
 - 8. Sample of E-Z Treat Pretreatment system effluent collected from the sampling point to check for effluent clarity and odor and a sample of influent, as required.
 - 9. Readings from pump cycle counters and run time meters and any water meter readings, as applicable.
 - 10. Current operational set up for TS-II nitrogen removal enhancement (percent returned to septic tank), and recommendation for modifications (if needed).
 - 11. System operating conditions, from the review of stored data for flow variances or other abnormal conditions.

- E. The authorized operator shall conduct any other measurements, monitoring, maintenance activities, and observations as specified in the Operation Permit (OP) and recommended by the manufacturer.

- F. Sampling and Testing
 - 1. All sampling shall be done in accordance with 15A NCAC 18E .1302 and .1709. E-Z Treat systems shall be sampled annually when the design daily flow is less than or equal to 1,500 gpd. Systems with design daily flows greater than 1,500 gpd and less than or equal to 3,000 gpd shall be sampled twice a year.
 - 2. Effluent for all systems shall be tested for effluent CBOD₅ and NH₄-N. Systems designed to meet the TS-II standard shall also have the effluent analyzed for TN (TKN and NO₃-N). Sampling is not required for fecal coliforms when the site is found to be compliant with all other constituents in Table XXV of 15A NCAC 18E .1201(a).
 - 3. Systems installed five feet from a property line shall be sampled for all the constituents in Section VI.22.
 - 4. Effluent samples shall be taken from the final dosing tank/chamber or a sampling port located downstream from the final treatment process.
 - 5. Influent samples, if needed, shall be taken from a sampling port located between the septic tank and recirculation tank/chamber.

G. Notification and Performance of Maintenance and Repairs

1. The authorized operator shall alert E-Z Treat Company, the LHD, and the system owner within 48 hours of needed maintenance or repair activities including but not limited to landscaping, tank sealing, tank pumping, pipe or control system repairs, media replacement, and/or adjustments to any other system component.
2. The authorized operator shall notify the system owner, E-Z Treat Company, and the LHD whenever the pump delivery rate efficiency or average pump run times are not within 25 percent of the initial measurements conducted prior to system start-up.
3. System troubleshooting and needed maintenance shall be provided to maintain the pump delivery rate and average pump run time within 25 percent of initial measurements conducted during system start-up.
4. Tanks will be pumped as needed upon the recommendation of the authorized operator and in accordance with the E-Z Treat Pretreatment system Operation and Maintenance instructions. At a minimum, the entire contents of all septic tank compartments shall be removed whenever the depth of both the scum and sludge is found to be more than one-third of the liquid depth in any compartment.
5. The tanks shall be pumped by a properly permitted septage management firm, and the septage handled in accordance with 15A NCAC 13B .0800.
6. All maintenance activities shall be recorded in the authorized operator reports provided to the system owner, the LHD, and E-Z Treat Company.

H. Reporting

The authorized operator shall provide a written report to the system owner, E-Z Treat Company, and the LHD within 30 days of each inspection. At a minimum this report shall specify:

1. The date and time of inspection;
2. Results from any laboratory analysis of any influent and effluent samples;
3. Maintenance activities performed since the last inspection report;
4. An assessment of overall system performance;
5. A list of any improvements or maintenance needed;
6. A determination of whether the system is malfunctioning, and the specific nature of the malfunction;
7. Any changes made in system settings, based on recommendations of the manufacturer; and
8. A summary report of data retrieved from the control panel including flow variances and other operating conditions.

IX. Responsibilities and Permitting Procedures

- A. Prior to the installation of an E-Z Treat Pretreatment system at a site, the owner shall submit an application or Notice of Intent (NOI) to the LHD for the proposed use of this system. Improvement Permits (IP) or Construction Authorizations (CA) issued by the LHD shall have a soil and site evaluation conducted either by the LHD, LSS, or Authorized On-Site Wastewater Evaluator (AOWE). The NOI shall include a soil and site evaluation conducted by an LSS.
- B. The IP, CA, and NOI shall contain all the conditions the site approval is based upon, including the proposed use of the Innovative system. The OP will include all conditions specified in the IP and CA. The Authorization to Operate (ATO) should include all the conditions specified in the

NOI.

- C. When a special site evaluation is required pursuant to 15A NCA 18E .0510, an evaluation and written, sealed report from a Licensed Soil Scientist (LSS) regarding the site shall be provided to the LHD. The report shall contain the information specified in 15A NCAC 18E .0510(d). The LHD may request the assistance of their Regional Soil Scientist in evaluating this report prior to permit issuance.
- D. The E-Z Treat Pretreatment system shall be designed by either an authorized designer, AOWE, or a PE. Systems over 1,000 gpd, or as required in accordance with 15A NCAC 18E .0303(a) shall be designed by a PE.
- E. Prior to the LHD issuing a CA for an E-Z Treat Pretreatment system, a design submittal prepared by an authorized designer, AOWE, or PE shall be submitted. The design submittal shall include the information required in 15A NCAC 18E .0305.
- F. It is recommended that local authorized environmental health specialists attend a design training session offered by the manufacturer or the authorized representative prior to permitting the system. Also, at the request of the LHD, a Regional Engineer will review the design.
- G. For sites required to be evaluated by an LSS or Licensed Geologist (LG), see Section V and IX.C, the LHD, AOWE, or PE may specify as a condition of the IP and CA that an LSS or LG oversee critical phases of the dispersal field installation and certify in writing that the installation was in accordance with their specified site and installation requirements prior to the OP or ATO issuance.
- H. The authorized operator shall be present during the final inspection of the system prior to the issuance of the OP or ATO.
- I. The LHD shall issue the OP after the following:
 - 1. Field verification of installation completion;
 - 2. Receipt of written documentation from the authorized designer, AOWE, or PE that the system has been designed, installed, and is operating in accordance with the approved plans; and
 - 3. All necessary legal documents have been completed, including the contract between the system owner and the authorized operator.

The LHD shall issue the OP for an (a2) and (a5) application after all necessary legal documents have been completed, including the contract between the system owner and the authorized operator.

The ATO shall be submitted to the LHD in accordance with G.S. 130A-336.1 and G.S. 130A-336.2.

X. Repair of Systems

The provisions of 15A NCAC 18E .1306 shall govern the use of the E-Z Treat Pretreatment system for repairs to existing malfunctioning wastewater systems.

Approved By: _____ Date: _____