

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

<b>INNOVATIVE WASTEWATER SYSTEM APPROVAL</b>
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INNOVATIVE WASTEWATER SYSTEM NO: IWWS 2015-03-R3

Issued To: E-Z Treat Company  
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Contact: Carl Perry, President  
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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

In accordance with General Statute 130A-343 and 15A NCAC 18E, Section .1700, a proposal by E-Z Treat Company for an updated approval of on-site wastewater systems utilizing the E-Z Treat Pretreatment system has been reviewed, and found to meet the standards of an innovative system when all of 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 (BOD<sub>5</sub>, 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).

## 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/subsurface water inflow/infiltration.

## IV. System Sizing

The 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

manufacturer specific drip approvals and 15A NCAC 18E .0510.

VI. Design Criteria

- A. The E-Z Treat Pretreatment system shall be designed in accordance with the following criteria.
  - 1. All tanks, septic, recirculation, and dosing, 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 7 ft 4 inches x 4 ft 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 4 to 6 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 across the media (short-circuiting).
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 in responsible charge (ORC) of the system authorized in writing by E-Z Treat Company 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 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 designer authorized in writing by E-Z Treat Company, engineer (if applicable), installer authorized in writing by E-Z Treat Company, and LHD prior to beginning construction 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. Additionally, all E-Z Treat Pretreatment systems and components used with, but not manufactured by E-Z Treat Company shall be installed in accordance with all applicable regulations and manufacturer instructions.
- C. All individuals/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/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 Test<sup>1</sup>
    - 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 distribution of flow to the E-Z Treat Pretreatment system and to the septic tank shall be measured during start-up and set to be in accordance with the system design with start-up settings recorded.
- 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.
- G. The installer authorized in writing by E-Z Treat Company, the engineer or designer authorized in writing by E-Z Treat Company, and the ORC authorized in writing by E-Z Treat Company shall conduct an inspection/start-up of the E-Z Treat Pretreatment system and all associated system components. The LHD personnel will attend and observe the inspection/start-up. During the inspection/start-up to include:
1. System watertightness testing.
  2. Control panel operation and alarm settings.
  3. Pump model numbers and time clock settings.
  4. Pressure head on the E-Z Treat pod wastewater distribution system.
  5. Return flow to the septic tank set per design and recorded, when applicable.
  6. Riser hatches have tamperproof bolts, and/or riser lock ring.

## VIII. Operation, Maintenance, Monitoring, and Reporting

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

- 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 operator authorized in writing by E-Z Treat Company in accordance with 15A NCAC 18E .1302(c). The system shall be inspected at the frequency specified in 15A NCAC 18E .1301(b), Table XXXII by a certified subsurface operator authorized in writing by E-Z Treat Company according. The ORC shall be either an employee of E-Z Treat Company or authorized in writing by E-Z Treat Company to operate and maintain the system. The operator authorized in writing by E-Z Treat Company must have proper equipment and training to access and program the control panels on site.
- 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 ORC authorized in writing by E-Z Treat Company shall, 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 ORC authorized in writing by E-Z Treat Company shall also conduct other additional observations, measurements, monitoring, and maintenances activities as specified in the Operation Permit (OP) and as 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. Systems with a design daily flow of 1,501 gpd to 3,000 gpd shall be sampled twice a year.

2. Effluent for all systems shall be tested for effluent CBOD<sub>5</sub> and NH<sub>4</sub>-N. Systems specified to meet the TS-II standard shall also have the effluent analyzed for TN (TKN and NO<sub>3</sub>-N). Systems designed to meet the TS-II standard with design daily flows of 1,501 gpd to 3,000 gpd shall have the effluent analyzed for fecal coliforms.
  3. Systems installed five feet from a property line shall be sampled for all the constituents in Section VI.22.
  4. Additional sampling of effluent or influent may be determined to be necessary by the ORC authorized in writing by E-Z Treat Company during a system inspection to assist with troubleshooting or to verify system performance.
  5. Effluent samples shall be taken from the final dosing tank/chamber or a sampling port located downstream from the final treatment process.
  6. Influent samples, if needed, shall be taken from a sampling port located between the septic tank and recirculation tank/chamber.
  7. Adjustments in the monitoring schedule and number of parameters sampled may be proposed by E-Z Treat Company and approved by the Department pursuant to 15A NCAC 18E .1709.
- G. Notification and Performance of Maintenance and Repairs
1. The ORC authorized in writing by E-Z Treat Company 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. System troubleshooting and needed maintenance shall be provided to maintain the pump delivery rate and average pump run time within 25% of initial measurements conducted during system startup. The ORC authorized in writing by E-Z Treat Company 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% of initial measurements conducted prior to system start-up.
  3. The septic tank will be pumped as needed upon recommendation of the ORC authorized in writing by E-Z Treat Company and in accordance with the E-Z Treat Pretreatment system operation and maintenance instructions. However, at a minimum, the septic tank will be pumped whenever the solids level exceeds 25% of the tank's total liquid working capacity or the scum layer is more than four inches thick.
  4. The tanks shall be pumped by a properly permitted septage management firm, and the septage handled in accordance with 15A NCAC 13B .0800.
  5. The ORC authorized in writing by E-Z Treat Company shall notify the LHD, E-Z Treat Company, and the system owner in writing whenever repairs are indicated. All maintenance activities shall be recorded in the ORC reports provided to the system owner, LHD, and E-Z Treat Company.
- H. Reporting
1. The ORC authorized in writing by E-Z Treat Company shall provide a completed 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:
    - a. The date and time of inspection,
    - b. System operating conditions according to Section VII.D, VII.E, and VII.F.



- c. Results from any laboratory analysis of any influent and effluent samples,
- d. Maintenance activities performed since the last inspection report,
- e. An assessment of overall system performance,
- f. A list of any improvements or maintenance needed,
- g. A determination of whether the system is malfunctioning, and the specific nature of the malfunction,
- h. Any changes made in system settings, based on recommendations of the manufacturer, and
- i. 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 or owner's agent shall file an application at the LHD for the proposed use of this system. After the LHD conducts a soil and site evaluation, the LHD may issue an Improvement Permit (IP) or Construction Authorization (CA) or amend a previously issued CA allowing for the use of a E-Z Treat Pretreatment system.
- B. The IP and CA shall contain all 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 the CA .
- C. When a special site evaluation is required pursuant to 15A NCAC 18E .0510, an evaluation and written, sealed report from a Licensed Soil Scientist regarding the site shall be provided to the LHD. The report shall contain the information as 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 one of the following: a designer authorized in writing by E-Z Treat Company or a PE. Systems over 1,000 gpd, or as otherwise required for drip irrigation systems, shall be designed by a PE.
- E. Prior to issuance of a CA for an E-Z Treat Pretreatment system, a design submittal prepared by a designer authorized in writing by E-Z Treat Company or a PE shall be submitted for review and approval by the LHD. 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/authorized representative prior to permitting the system. Also, at the request of the LHD, a Regional Engineer will review the design.
- G. The designer authorized in writing by E-Z Treat Company shall certify in writing that the E-Z Treat Pretreatment system was installed in accordance with the approved design prior to OP issuance.

- H. A PE shall certify in writing that a system designed by an engineer was installed in accordance with the approved plans and specifications prior to OP issuance.
- I. For sites required to be evaluated by a Licensed Soil Scientist or Licensed Geologist (see Section V and IX.C), the health department may specify as a condition on the IP and CA that a Licensed Soil Scientist or Licensed Geologist oversee critical phases of the dispersal field installation and certify in writing that the installation was in accordance with their specified site/installation requirements prior to the OP issuance.
- J. The ORC authorized in writing by E-Z Treat Company shall be present during the final inspection of the system prior to the issuance of the OP. The ORC shall be certified as a NC Subsurface Operator and authorized in writing by E-Z Treat Company.
- K. The LHD issues the OP after the following:
  - 1. Field verification of installation completion;
  - 2. Receipt of written documentation from the designer authorized in writing by E-Z Treat Company or the engineer, as applicable, 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 ORC authorized in writing by E-Z Treat Company.

K.

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: \_\_\_\_\_