

# Basic Maintenance Provider Course Outline

## Aerobic Treatment Systems

(16 Hours Minimum)

*Note: This outline is a minimum. TCEQ-approved courses can require a longer time related to satisfactorily completing the training*

- I. Introduction and Overview (15 minutes)
  - A. Course expectations
  - B. Necessity for training/Legislative requirements
  - C. Explanation (and written statement) that successful completion of this training does **not** guarantee that the manufacturer will certify the maintenance provider on that manufacturer's product(s).
  - D. Other related topics
  
- II. Health and Safety (45 minutes)
  - A. Exposure to pathogens
  - B. Possible safety hazards
    - 1. Electrical
    - 2. Insects and animals
    - 3. Cuts and abrasions
    - 4. Confined space entry
    - 5. Excavations
    - 6. Lockout/Tagout
    - 7. Other
  - C. Personal protective equipment
    - 1. Gloves
    - 2. Clothing
    - 3. Footwear
    - 4. Eye protection
    - 5. Pest deterrents
    - 6. Snake bite kit
    - 7. First aid kit
    - 8. Disinfectant hand wash
    - 9. Hand washing equipment and supplies
    - 10. Additional equipment
  - D. Safety practices
    - 1. Sanitation
    - 2. Lifting
    - 3. Spill control and cleanup
    - 4. Confined spaces
  - E. Weather
  - F. Immunizations

### III. Treatment Principles and Processes (7 Hours)

#### A. Treatment and disposal requirements

##### 1. Wastewater loading

###### (a) Flow

- (1) Design flowrate
- (2) Peak flowrate
- (3) Typical flowrate

###### (b) Strength

- (1) Biological
- (2) Chemical
- (3) Physical

###### (c) Water softeners

#### B. Indicators of strength

##### 1. Secondary treatment standards (Including Aerobic Treatment)

###### (a) Applicability, aerobic systems allowed for unsuitable soil conditions per 30 TAC 285.31(b) and 30 TAC 285.91(13)

- (1) Surface application
- (2) Subsurface drainfields with unsuitable soil conditions require secondary treatment and disinfection, per 30 TAC 285.33(d)(5). Also, see 30 TAC 285.91(13) for listing of subsurface options.

###### (b) Standards

- (1) Treatment effluent standards for BOD, TSS and pH as listed in 30 TAC 285.32(e).

###### (c) More stringent requirements may be set by local Authorized Agents

##### 2. Disposal requirements

###### (a) Malfunction prohibited per 30 TAC 285.70

###### (b) Nuisance prohibited, See definition of *Malfunctioning OSSF*, 30 TAC 285.2(38) and *Nuisance*, 30 TAC 285.2(42).

###### (c) Secondary treatment

- (1) Surface application, per 30 TAC 285.91(13)

###### (d) Disinfection

- (1) Surface application, per 30 TAC 285.33(d)(2)(D)
- (2) Subsurface drainfields with unsuitable soil conditions require secondary treatment and disinfection, per 30 TAC 285.33(d)(5).

###### (e) More stringent requirements may be set by local Authorized Agents

- C. Pretreatment
  - 1. Purpose
  - 2. Trash traps
  - 3. Grease interceptors
  - 4. Septic tank
  - 5. Other
- D. Aerobic digestion
  - 1. Purpose
  - 2. Aeration chamber
  - 3. Compressors and blowers
  - 4. Aerator
  - 5. Diffuser
- E. Clarification
  - 1. Purpose
  - 2. Clarification vessel
  - 3. Sludge return
- F. Combined systems
- G. Disinfection
  - 1. Chlorine/Hypochlorite
  - 2. Ultraviolet lighting
  - 3. Ozone
- H. Discharge/Pump tank
  - 1. Discharge pump
- I. Control system
  - 1. Control panels
  - 2. Water level sensors
  - 3. Pressure sensors
  - 4. Timers
  - 5. Alarms
  - 6. Electronic monitoring and automatic notification
  - 7. Others
- J. Disposal
  - 1. Surface application
  - 2. Subsurface disposal
    - (a) Absorptive, leaching chamber, gravelless pipe drainfields
    - (b) Drip irrigation
    - (c) ET bed - Lined/Unlined
    - (d) Low pressure dosing/Pumped effluent drainfield
    - (e) Mound, soil substitution drainfields
    - (f) Others
  - 3. Graywater systems (review per 30 TAC 285.80 and 285.81)

#### IV. Testing and Evaluation (3 Hours)

- A. Owner's treatment system assessment
- B. Visual
  - 1. Observing airflow and distribution
  - 2. Color, texture and clarity
    - (a) Influent
    - (b) Activated sludge
    - (c) Wastewater in clarifier
    - (d) Effluent
    - (e) Oil and grease
    - (f) Trash and nondigestible material
- C. Odors
  - (a) Influent
  - (b) Activated sludge
  - (c) Wastewater in clarifier
  - (d) Effluent
- D. Sludge volume and characteristics
  - 1. 30 minute sludge volume test
- E. Airflow
  - 1. Blower/Compressor functioning
  - 2. Pressure testing
  - 3. Distribution
- F. On-site wastewater tests
  - 1. Chlorine residual
  - 2. Sludge volume test
  - 3. Other tests; fecal coliform, pH and DO
  - 4. Sample locations
- G. Laboratory analysis
  - 1. Biological Oxygen Demand (BOD<sub>5</sub>)
  - 2. Total suspended solids
  - 3. Fecal coliform
  - 4. Other diagnostic tests
  - 5. Sample locations
- H. Influent vs effluent tests
  - 1. Influent and internal system tests are diagnostic
  - 2. Effluent tests may be diagnostic or compliance tests
- I. Evaluating system performance
  - 1. Use testing and data gathered to evaluate system performance and locate problems.

#### V. Compliance Tests and Periodic Reports (2 Hours)

- A. BOD<sub>5</sub>/TSS

- B. Chlorine residual or fecal coliform analysis
- C. Required reporting and options
  - 1. Reporting required for any secondary treatment Unit, per 30 TAC 285.7(d) and 30 TAC 285.91(12).
  - 2. Recommended report format shown in 30 TAC 285. Includes Items Inspected, Repaired, Replaced, Complaints and Test Results Where Applicable.
- D. Testing and report frequency
  - 1. Test frequency set by 30 TAC 285.7(d)(1) and 285.91(12)
    - (a) Surface application, test and report a minimum of once every four months.
    - (b) Subsurface disposal, test and report a minimum of once every four months
    - (c) Reports must be submitted within 14 days of each compliance test per 30 TAC 285.7(d)(1).
    - (d) The required number of tests per year will be reduced from three to two per year if electronic monitoring and notification is used on the system. See 30 TAC 285.7(d)(3).
- E. Consequences of not completing tests and reports
  - 1. Maintenance company subject to administrative penalties including fines and revocation of license or registration based on frequency and recurrence of violations, per the Texas Health and Safety Code Chapter 366.0515, Sections (k), (l) and (m).
- F. Consequences of noncompliance
  - 1. Owner required to achieve compliance by repairing malfunctions on a schedule determined by number and frequency of malfunctions per 30 TAC 285.70. Malfunctions include:
    - (a) Failing an effluent standard is an indication of a malfunctioning system.
    - (b) Inspection reports showing uncorrected physical conditions, complaints or nonfunctioning equipment indicates a malfunction.
    - (c) A system creating a nuisance is considered a malfunction. See 30 TAC 285.2(38) and (42).
- G. More stringent requirements may be set by local Authorized Agents
- H. Record keeping

## VI. General Operation and Maintenance of Aerobic Treatment System

(1 Hour)

- A. Airflow
- B. Feeding the system
  - 1. Aerobic treatment systems are designed to digest domestic wastewater.
  - 2. Items and substances that will cause an aerobic treatment system to malfunction.
- C. Alarms
- D. Extended absences
- E. Observations
- F. Parts replacement
  - 1. Certified parts required to maintain system certification
- G. Emergency maintenance
  - 1. Regulatory considerations

## VII Overview of Tools, Parts and Supplies (1 Hour)

- A. Tools
  - 1. Testing and diagnosis
    - (a) Chlorine DPD field test kit (Not a swimming pool kit, get a kit which can measure down to 0.1 mg/L total chlorine).
    - (b) Multimeter with adequate voltage ranges
    - (c) Air pressure and airflow gauges
    - (d) Graduated container for solids sampling tests
    - (e) pH and DO test kits
    - (f) Sample containers, labels and cooler
    - (g) Sludge judge
  - 2. Manufacturer required specialty tools
  - 3. Common hand tools including screwdrivers, pliers, cutters, wrenches, hacksaw, portable drill and wire brush.
  - 4. Cleanup equipment including portable pumps, broom, putty spatula, buckets, water hose and skimmer net for floating solids.
- B. Parts
  - 1. Manufacturer specified parts for field service
  - 2. Miscellaneous electrical fittings
  - 3. Plastic pipe fittings and supplies
- C. Supplies
  - 1. Appropriate containers for disposal of contaminated material
  - 2. General site cleanup items including plastic trash bags, plastic bristle paint brushes.

3. General electrical and mechanical supplies:  
electrical tape, PVC cement, nuts, bolts, washers

#### VIII. Final Examination (1 Hour)

#### Appendices:

- A. Glossary of Terms
- B. Regulatory References