ECOLOGICAL TANKS, INC.

Downsville, Louisiana

AQUA SAFE® and AQUA AIRE®

AEROBIC TREATMENT

DISTRIBUTOR/CONTRACTOR TRAINING & CERTIFICATION

Presented at NOWRA 2025
Mega-Conference, October 19-22, 2025.

Ecological Tanks Inc.

The following presentation is based on my opinions and experiences and are not representative of the NOWRA.

ECOLOGICAL TANKS, INC.

- Founded 1994 by ATU pre-caster, contractor, plumber
- Top quality line of products & support to professionals
- Product range versatile, adaptable, & reliable
- NSF 40-certified since 1994; exceeds Class I Wastewater

ECOLOGICAL TANKS, INC.

Active Markets

- Alabama
- Arkansas
- Georgia
- Florida
- Hawaii
- Illinois
- Iowa
- Kansas
- Louisiana
- Mississippi
- Missouri
- North Carolina
- New Mexico
- New York
- Ohio
- Oklahoma
- Oregon
- Pennsylvania
- South Carolina
- South Dakota
- Texas
- Trinidad
- Virginia
- West Virginia
- British West Indies
- (Turks and Caicos Islands)

ECOLOGICAL TANKS, INC.

MANUFACTURING PLANT

Downsville, Louisiana
Photo by Donald Wheeler

AQUA SAFE® & AQUA AIRE®

- Low-cost alternatives for advanced treatment of domestic sewage
- Certified to NSF Standard 40 for performance & treatment efficiency
- Produce high quality effluent to protect groundwater & the environment.
- Provide years of reliable treatment with simple, routine maintenance
- Perfect upgrade from a septic tank for communities & businesses

AQUA SAFE® Aerobic Treatment Plants

AQUA SAFE®

- Design maximizes owner's benefit and minimizes installer's labor & installation costs
- Design uses versatile top-of-the-line parts for simplicity and adaptability for the onsite installer
- Design includes all-in-one multi-tank configurations with one-box controls for pumps, aerators, and other accessories
- Diffusers never have to be cleaned

AQUA SAFE ®

Structural design and added fiberglass give you the strongest tank in the industry.

Size allows for two full days of retention time. This feature coupled with its process design achieves the cleanest effluent in the industry.

Tanks are promptly delivered and pickup of tanks are pre-assembled for easy installation

AQUA SAFE®

Access ports are strategically located to minimize maintenance time

Controls and alarms are specifically designed to be reliable and user friendly

AQUA SAFE® REMOVES 98+%

- ✓ **ANSI/NSF Standard 40 Class I**
- ✓ **CBOD—2.37 mg/l***
- ✓ **TSS—2.11 mg/l***
- ✓ **NO3—7.52 mg/l**
- ✓ **TN—14.90 mg/l**
- ✓ **TP—5.87 mg/l**

CLEAN EFFLUENT DISPOSAL REDUCES GROUNDWATER POLLUTION.

***30-day mean**

ECOLOGICAL TANKS, INC.

AQUA AIRE® Aerobic Treatment Plants

AQUA AIRE®

- Carries similar high quality tank & reliable performance; but lower cost
- Tanks are watertight with short profile for shallow rock installations
- Diffusers never have to be cleaned
- Tanks are pre-assembled with poly seals

AQUA AIRE®

- Tanks carry versatile packages of top-of-the-line components for simplicity and adaptability for professional installers

- All-in-one multi-tank configurations with one-box controls for pumps, aerators and other accessories

AQUA AIRE®

- Size allows for 26 hours of retention time in the aeration zone with 9 hours of retention time in the clarifier. NSF testing resulted < 3 CBOD and < 5 TSS (30 day effluent average)

- Tanks are pre-cast locally for prompt delivery – check for availability

ECOLOGICAL TANKS, INC.

AQUA AIRE® REMOVES 98+%

- ✓ **ANSI/NSF Standard 40 Class I**
- ✓ **CBOD – 2.89 mg/l***
- ✓ **TSS – 4.43 mg/l***
- ✓ **NO_3 – 6.13 mg/l**
- ✓ **TN – 19.17 mg/l**
- ✓ **TP – 6.69 mg/l**

CLEAN EFFLUENT DISPOSAL REDUCES GROUNDWATER POLLUTION AND ALLOWS FOR SMALLER DRAINFIELDS.

***30-day mean**

AQUA SAFE® & AQUA AIRE®
AEROBIC TREATMENT SYSTEMS

Work With All Disposal Methods

- Conventional Drain Fields
- Leaching Chambers
- Shallow Trenches and Beds
- Mound Systems
- Drip Irrigation
- Spray Irrigation

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ESSENTIAL COMPONENTS OF ATU'S

1. Pre-treatment or trash tank to intercept grease, oils, large solids, & other debris
2. Aeration chamber where waste is mixed with supply of O_2
3. Properly sized air compressor, matched to the waste strength
4. Clarifier to separate solids & produce highly treated effluent
5. A control box with alarm to detect a problem or malfunction

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PRE-TREATMENT or TRASH TANK

- Usually a single compartment tank that is watertight
- Traps grease, oils, large solids, & other debris
- Need only short detention time, maintaining wastewater strength
- Septic tank effluent filter not needed - check manufacturer's requirements

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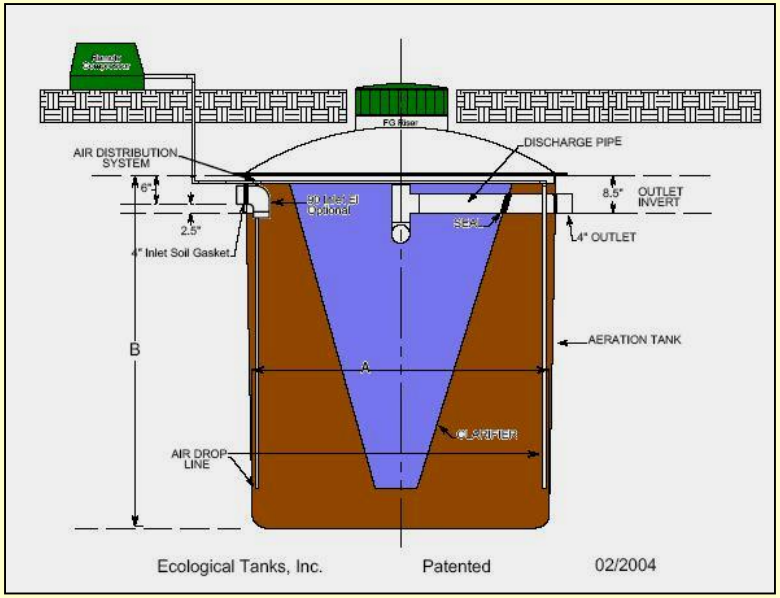
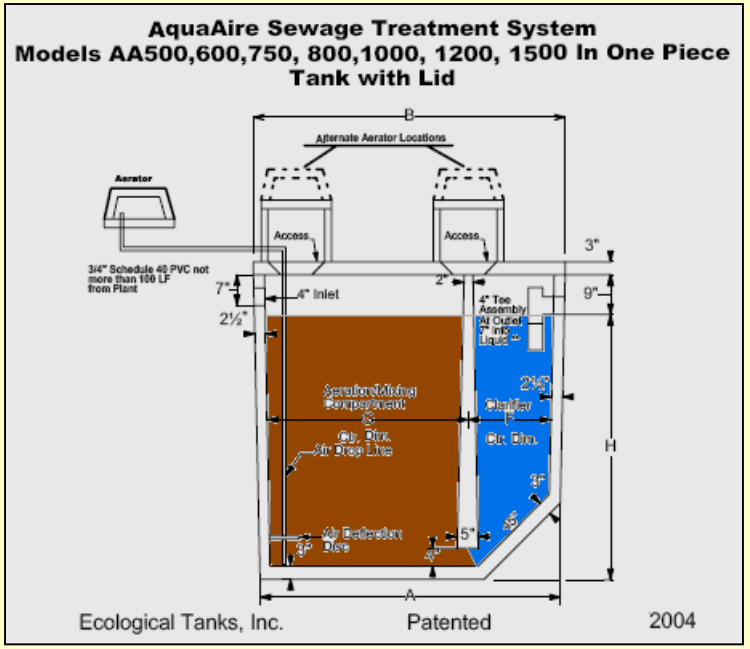
AERATION & CLARIFICATION CHAMBERS





AERATION

- Provides constant flow of air with O_2
- Fine bubbles for good O_2 transfer
- Bubble size & air line placement designed to roll & churn liquid waste & aerobic bacteria
- Microbes eat, grow, & multiply on waste matter producing a high concentration of cells for the activated sludge
- Cell growth limited by waste strength, flow, & O_2 supply
- Aerobic bacteria inactivated by toxic chemicals, grease, low air supply
- Leave some sludge in tank when pumping for quick restart of aerobic digestion process
- Duration ~ 36 hours – Aqua Safe
- Duration ~ 26 hours – Aqua Aire

Clarification

- Quiet zone removes solids
- Bacterial cells clump together to form ‘floc’
- Floc settles to bottom of clarifier by gravity and returns to activated sludge to reenter aeration process
- Clarifier shape & size maximizes solids separation, for clear, odorless effluent with low BOD & TSS
- Discharge ‘T’ assembly must be level to prevent floc particles from leaving ATU
- Longer retention = more settling
- Duration ~ 12 hours – Aqua Safe
- Duration ~ 9 hours – Aqua Aire

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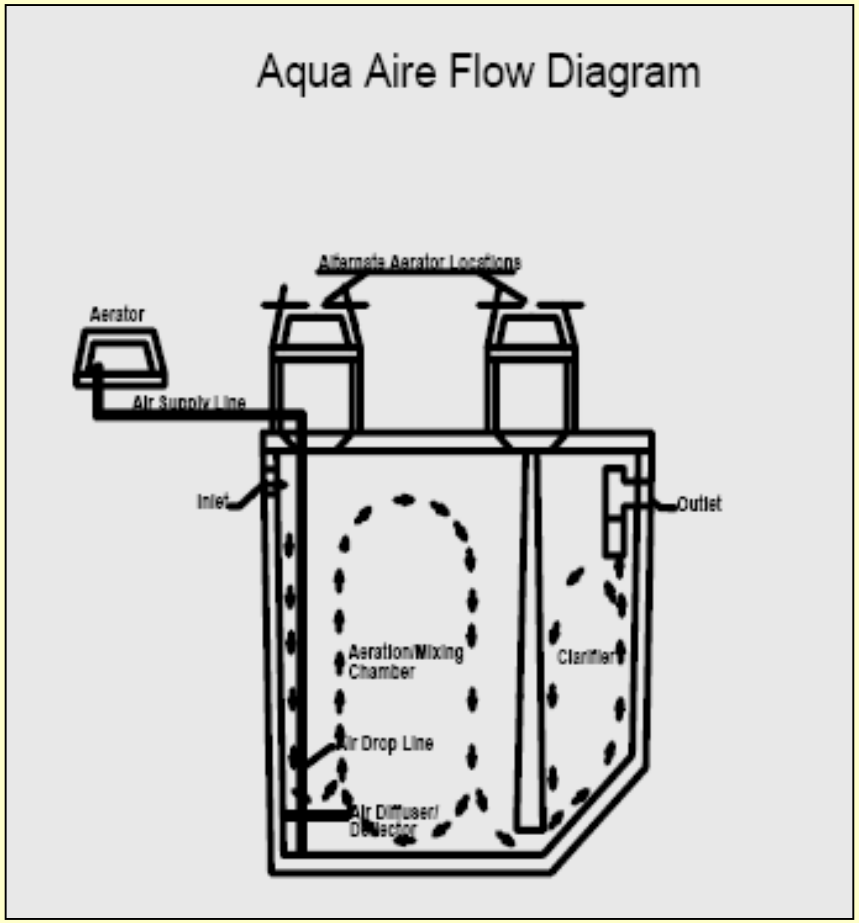
AIR DISTRIBUTION SYSTEM

AQUA SAFE AS500EZ
Ecological Tanks, Inc.



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AIR COMPRESSORS

Linear compressors connects to air drop lines for fine bubble diffusion

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LINEAR COMPRESSORS

Covers removed.

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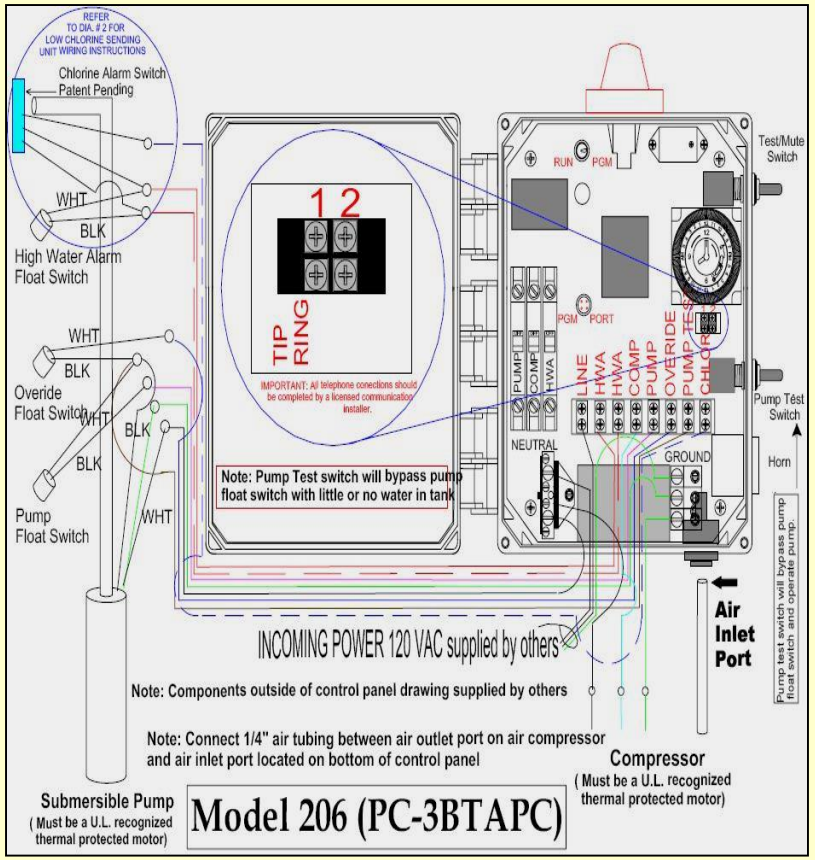
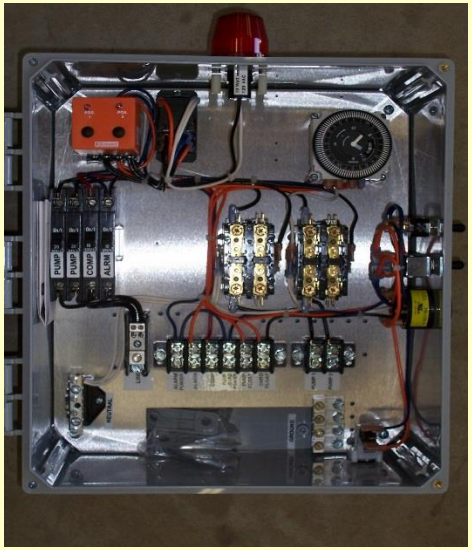
CONTROLS & ALARMS

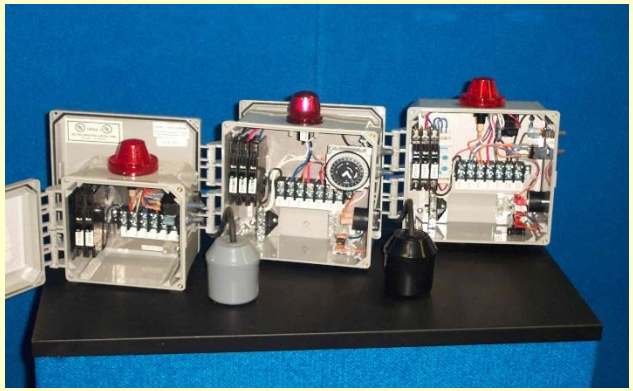
- Controls manufactured in-house with expert technical assistance available



CONTROLS & ALARMS

- One-box controls for air compressors, pumps, headworks units, floats, etc…
- Treatment plant operation monitored by single/dual air switch
- Alarm wired separately
- Simplex/duplex models with/out remote sensing available





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GOOD AEROBIC TREATMENT DEPENDS ON:

- Ample Air supply-DO
- Waste strength - BOD
- Waste volume
- Temperature
- Low Toxicity
- pH 6-8
- Regular maintenance

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NSF STANDARD 40 CERTIFICATION

- All ATU's approved for use are certified to Standard 40 for Class I Effluent through the National Sanitation Foundation (NSF), or its equivalent
- Consensus Standard 40 established 1970 by industry, regulators, & users and is revised periodically with the latest revision in 2000
- Minimum standards for installation, owner, operation, repair manuals
- Addresses structural integrity, electrical components, access ports, failure-sensing devices, flow design, data & service plates etc…
- 2-year maintenance contract; manufacturer to train & certify installers & maintenance providers

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NSF STANDARD 40 continued

- Must have standby parts available & emergency service within 48 hours
- NSF Testing: 6 months (CBOD & TSS) 5 days per week at rated capacity
  - Manufacturer cannot touch after initial setup
  - Loading Regimes: 35% 6-9 am; 25% 11-2 pm; 40% 5-8 pm
  - Stress Tests: 48- hour power out; 7-day vacation; wash day stress; working parent stress
- Performance: 30-day average CBOD < 25 mg/l; TSS < 30 mg/l; pH 6-9
- Minimum maintenance: every 6 months; record conditions; retain records

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INSTALLATION PROCEDURES

- Contractor must be licensed and certified
- After receiving permit or approved design, select site that will not receive vehicular traffic and have proper setbacks
- Excavate hole 1’ wider than tank and deep enough so that access ports & air vent are at or above grade (≥10’ from foundation)

Please read the installation manual for more details & precise instructions

INSTALLATION PROCEDURES

- Apply sand or clean fill over level undisturbed earth for a firm, solid base to prevent shifting or damage (remove rocks or sharp objects)
- Install tank level in hole – shoot end to end, side to side
- Connect 4” PVC from building stub out to tank inlet ensuring slight fall (usually 1/8” per foot)

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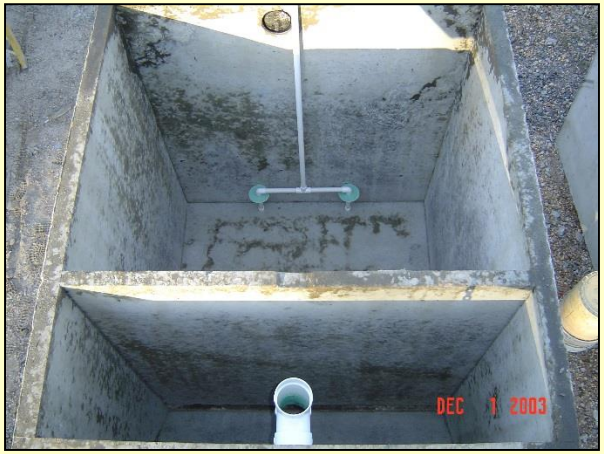
INSTALLATION PROCEDURES

- **Run ¾” Sch. 40 PVC air line from aerator to ATU < 100 feet, free of dirt or debris, with 12” of cover**
- **Ensure diffuser on Aqua Aire is securely positioned against inlet wall of aerobic tank (level and centered)**



Please read the installation manual for more details & precise instructions

INSTALLATION PROCEDURES

- Inspect baffles, risers and discharge T's to ensure structurablity and levelness
- Fill tank(s) to discharge outlet with potable water
- Backfill evenly around tank with clean fill, excluding rocks or large items, after making all connections watertight

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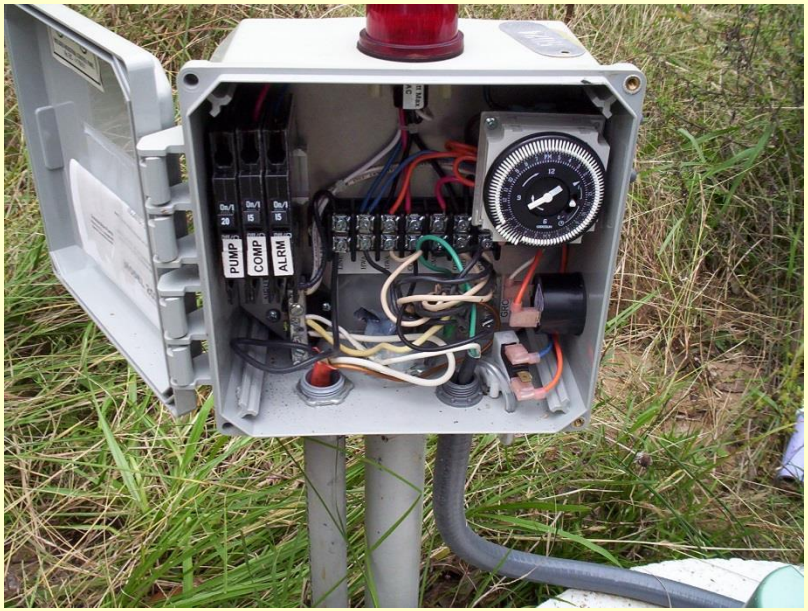
INSTALLATION continued

- **Ensure proper venting of gases.**
- **Install aerator in well ventilated & flood-free area < 100 feet from ATU**

Please read the installation manual for more details & precise instructions

INSTALLATION continued

- Install control box with 12-14 gauge wire in electrical conduit (12” of cover) sealed against moisture
- Wire alarm, pump, floats, etc. to panel following wiring diagrams provided.
- Electrical connections should be made by licensed electrician in accordance with local requirements



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INSTALLATION continued

- Turn on power to aerator wired to box
- Test controls and all components for proper operation per manufacturer's instructions
- Check for air leaks along air line
- All downspouts, roof run-off, surface run-off, ditches, or French drains must be diverted away from the tanks and effluent disposal field.
- Complete warranty form in owner's manual & return bottom portion to factory within 30 days

Please read the installation manual for more details & precise instructions

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ROUTINE MAINTENANCE

The following should be performed as routine maintenance every 6 months, by a licensed & certified service provider:

- **1. 30-minute Sludge Test (once a year)**
- **2. Check control panel**
- **3. Check & service air compressor**
- **4. Check air flow**
- **5. Inspect aerobic treatment plant**
- **6. Check pump & pump tank, if applicable**
- **7. Complete 30-minute Sludge Test**
- **8. Record service visit**

Note: Service provider must know and comply with all state, local, & NSF requirements.

Please read the installation manual for more details & precise instructions

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ROUTINE MAINTENANCE continued

- **1. Perform 30 minute Sludge Test to measure sludge buildup once a year**
  - **Pull a sample from the aeration chamber and let stand for 30 mins**
- **2. Check control panel for power, alarm, or abnormal condition.**
- **3. Check aerator for quiet hum and**
  - **Observe signs of flooding or standing water**
  - **Remove filter, clean, & replace dry**
  - **Use new filter each year, or if filter cannot be cleaned**
  - **Clear away soil, ants, other debris from aerator**
  - **If diaphragm or other parts are damaged, see manual for repair or replacement options**
  - **Replacing diaphragm block every 3 years (low cost) & filter every year to extend life of aerator.**

Please read the installation manual for more details & precise instructions

Keep a record of each service visit and copy the owner, and, if required, the health department.

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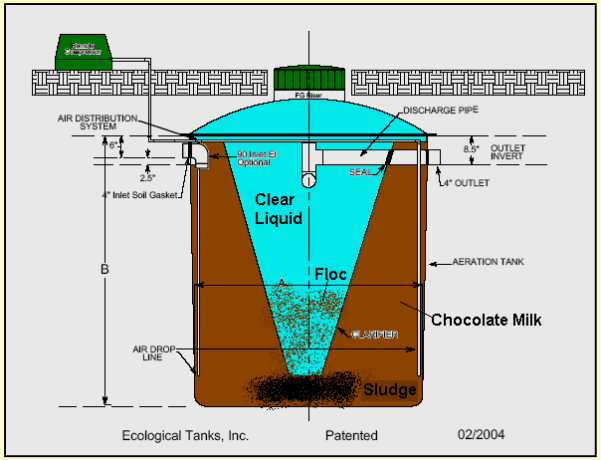
ROUTINE MAINTENANCE continued

- 4. Check air flow from aerator to ATU for leaks, breaks, or blockage
  - A pressure gauge can be used to measure air flow annually, or if air flow is not normal
  - Normal air pressure range – 1.83 - 2.85 p.s.i.
- 5. Inspect aerobic treatment plant for:
  - Color/rolling action in aeration tank – l. brown
  - Scum overflow – should not exit from tank
  - Turbidity - Clear liquid in clarifier
  - Odors – a musky or earthy smell
  - Discharge – clear path & clear liquid
- 6. Check pump tank, if present
  - Remove pump & clean away any debris from screen
  - Check all floats for proper function
  - Turn pump on manually & observe
  - Check for silt, solids, or abnormal conditions



Please read the installation manual for more details & precise instructions

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ROUTINE MAINTENANCE continued

- 7. Complete 30-minute Sludge Test
  - Pump tank if 60% or more settable solids are in jar.
  - Pump out pump tank, trash tank, & then ATU
  - Leave small amount of sludge in ATU as starter to reactivate treatment process
  - Always refill tanks after pump out
- 8. Record the following at each service visit:
  - observations,
  - model & serial #,
  - conditions,
  - problems,
  - repairs,
  - parts replaced,
  - next service date
  - If corrective action can not be made at the time of inspection, estimated time when correction can be made
- 9. Retain copy of records, & give a copy to the owner, and, if required, the health department

Please read the installation manual for more details & precise instructions

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TROUBLE SHOOTING

- **Normal operation of Aqua Safe & Aqua Aire treatment plants should show rolling chocolate brown liquor in aeration chamber with slight earthy smell, pH between 6.5 & 8.5, & DO of 1-5.5 mg/l. Effluent from clarifier should be clear & odorless.**

Abnormal Condition	Possible Cause	Remedy
Offensive odors from plant & effluent	Aerator or air flow interrupted, clogged, leaking, or off	Check for power to aerator; air flow within pressure range; & correct
Murky/grey liquor with sour odor from effluent	Plant starved from low flow or BOD due to oversized trash trap	Evaluate owner usage/loading habits; remove filter if used; adjust as needed
Black liquor with septic odor & pH between 6.5-8	Plant getting little or no air over long periods; air flow reduced or off	Check for power to aerator; air flow within pressure range; & correct
Black liquor & blackish effluent with foul odor and acidic pH	Growth or aerobic bacteria inhibited by sewage containing toxic matter	Evaluate owner usage/loading habits (bleach, cleaning agents, antibiotics); use approved bacterial additives or pump tank for fresh start
Black liquor viscous, brown, foamy, foul odor; effluent high in TSS	Filamentous bacteria due to low food:microbe ratio, low pH, toxics	Evaluate owner usage/loading habits; adjust pH; pump tank for new start

Please read the installation manual for more details & precise instructions

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INITIAL SERVICE CONTRACT, WARRANTY, & ETC.

- A 2-year service contract including 4-8 service visits must be included in the purchase price to the owner
- A continuing service contract with similar terms must be made available before the end of the initial contract
- A 5-year prorated warranty is provided as follows:
  - 100% first 2 years
  - 75% replacement cost of aerator in year 3
  - 50% replacement cost of aerator in year 4
  - 25% replacement cost of aerator in year 5
  - A service contract must be in effect in years 3, 4, & 5
- The service contract does not cover pumping of sludge from ATU
- Warranty excludes damage by ants, flooding; improper installation; owner abuse; or act of nature

Please read the installation manual for more details & precise instructions

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OWNER'S MAINTENANCE & RESPONSIBILITIES

- **Read owner's manual for the Do's and Don'ts for proper care & operation; the design treatment capacity; provisions of maintenance agreement and warranty; & the need for regular maintenance for years of trouble-free operation**
- **Prevent damage to mechanical or electrical components by ants, rodents, flooding, etc. which are not covered by warranty**
- **Check for the following on a routine basis:**
  - **Audible or visual alarm on control box indicating a malfunction**
  - **Offensive odors in the event an interruption of air flow or other cause**
  - **Operation of air compressor with low hum & vibrations**
  - **Dry conditions around air compressor with no ant hills, flooding, etc…**
- **Continue service contract for service visits every 6 months by factory certified contractor (check local or state rules for time intervals)**
- **Maintain records of permit documents & all service visits to aid in trouble-shooting, if needed, and to pass on to future owner**

Please read owner's manual for more details & precise instructions

ECOLOGICAL TANKS, INC.

DISTRIBUTOR RESPONSIBILITIES

- **Market & promote Aqua Safe or Aqua Aire aerobic treatment systems in assigned territory**
- **Comply with distributor agreement with ETI; standards & policies of ETI regarding use and application of its products**
- **Maintain back-up parts in designated territory for prompt service and repair of Aqua Safe or Aqua Aire installations within 48 hrs.**
- **Train and certify Aqua Safe or Aqua Aire installers & service providers in line with product manuals; NSF Standard 40 requirements; & responsibilities**
- **Instruct installers/maintainers to provide owner's manual; complete warranty registration; perform required maintenance; and keep records**
- **Report installation/maintenance updates to state/local regulators**

Please read the product installation manual and distributor agreement for more precise details

ECOLOGICAL TANKS, INC.

FOR MORE INFORMATION

CALL Home Office @ (318) 644-0397