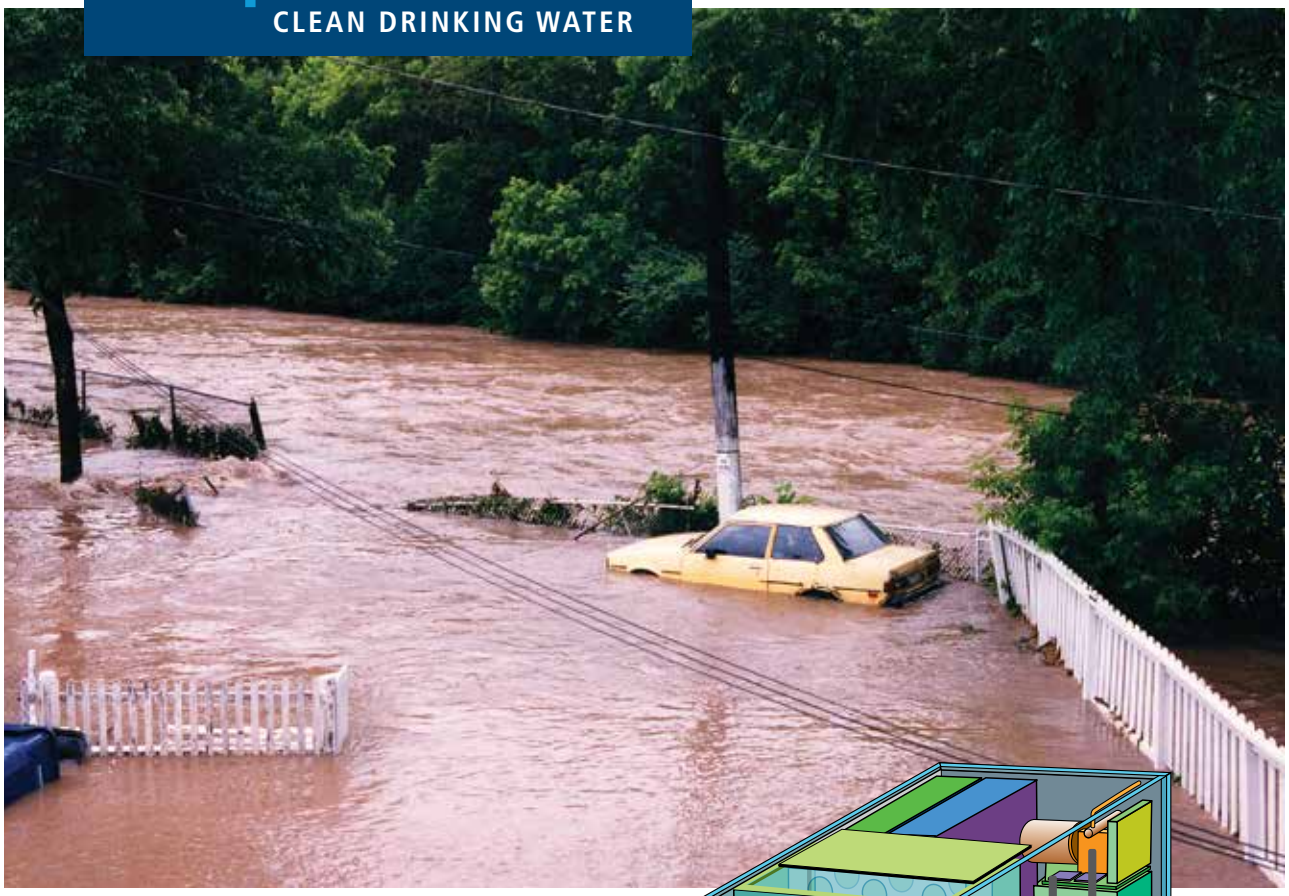
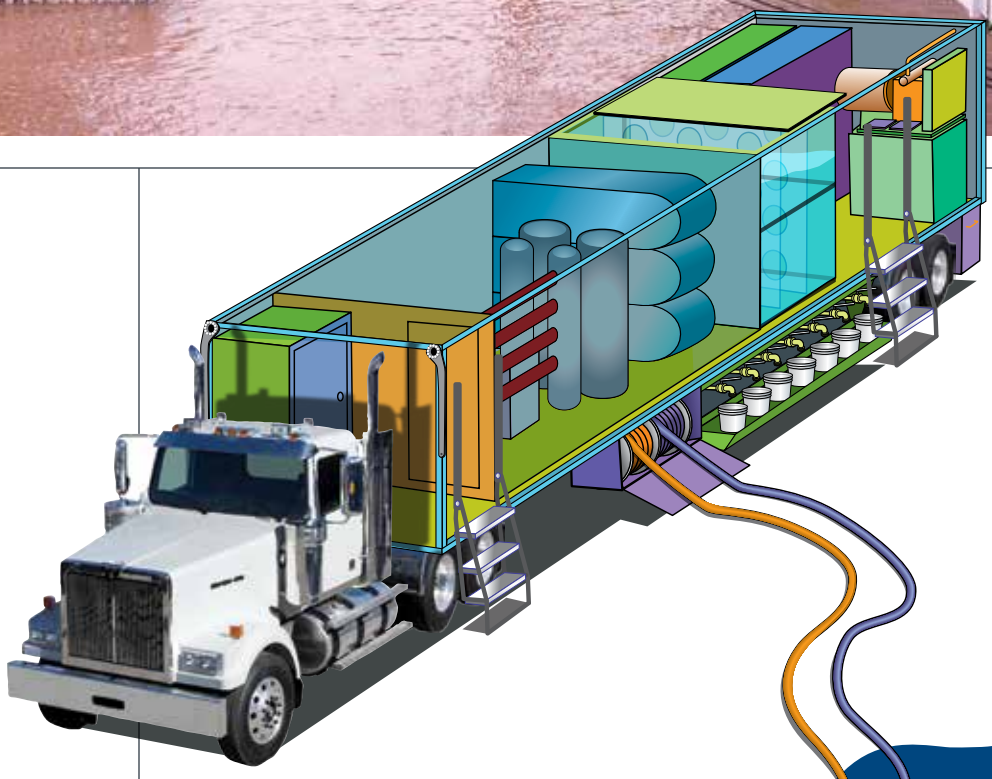
AquaMobile3000™

CLEAN DRINKING WATER





FRESH DRINKING WATER TREATMENT SYSTEMS FOR DISASTER RELIEF RESPONSE

QUICK TEMPORARY SUPPLY OF POTABLE WATER IN REMOTE AREAS

AQUALTRA™ TECHNOLOGIES

AquaMobile3000™

The AquaMobile 3000™ from Aqualtra Technologies, LLC. is a mobile, self-contained, patented system that includes pretreatment, ultrafiltration, disinfection, storage, and dispensing capability in a single trailer. This system is capable of providing a rapid-deployment and cost-effective solution to supply potable water to a population of 403 users for short-term operating conditions over a period of one to several weeks (up to 5,250 people per day under emergency conditions). The treatment system is used in remote areas where fresh drinking water is not readily available as a result of adverse environmental conditions such as flooding, earthquakes, contamination of traditional water sources, drought, etc. It may also be utilized in conditions where the lack of potable water infrastructure exists in both developed and developing regions of the world.

All dimensions given are approximate and are rounded.

Unique System Capabilities

- May be connected to an existing water distribution grid or dispensed as potable water at a location of immediate need
- Allows for the dispensing and transferring of potable water, in 5-gallon water collection containers, to 403 people at the rate of 13 gallons per person per day (6.5 gallons dispensed in the morning and 6.5 gallons dispensed in the evening)
- Under extreme conditions, the system has the capability of treating raw water, and delivering and dispensing potable water to 5,250 people at a rate of 1 gallon per person per day
- The AquaMobile 3000 system is capable of dispensing drinking water at the stated quantities for the number of users indicated above within approximately a 50-minute dispensing period per dispensing event (under normal operating conditions)
- The AquaMobile 3000 has the ability to transfer water from remote accessible surface water sources and deliver it in the form of treated potable water to distant communities or settlements where needed

* The AquaMobile 3000 system is equipped with 1,568 water collection containers, thus providing 868 additional containers for wear and tear replacement.

Reliable Mobile Systems for These Applications

- Rapid deployment by disaster relief organizatins in response to emergency situations where potable water is required
- To supply mobile equipment producing fresh drinking water for developing countries
- To provide emergency potable water supply to a population in disaster-stricken areas
- At remote exploration sites by companies and government agencies to meet the water needs of their employees and staff*
- At remote locations where seasonal camping activities or large gatherings necessitate the availability of potable water sources
- For large concert or sporting events that necessitate the availability of an independent, reliable supply of fresh drinking water
- To remove undesirable chemical elements from water such as humic acids, colloids, algae, bacteria and color
- To meet potable water needs in continuous, self-sustained field operation over a period of 14 days

*The AquaMobile 3000 treatment system can also be used to provide potable water supply and to have water pumped directly to facilities throughout the duration of a project.

System Summary

The AquaMobile 3000 unit comprises a water intake pumping system, a water treatment system, water storage tank, water dispensing modules, water collection containers compartment and a fuel-powered generation system, all self-contained within a semi-tractor trailer. The AquaMobile 3000 unit is coupled to a tractor fitted with a powerful 425 HP Volvo engine capable of reaching a maximum speed of 87 miles per hour. The AquaMobile 3000 system is equipped to reach remote locations and is capable of sustainably operating for a period of one to two weeks.

Treatment Technology

Water transferred to the AquaMobile 3000 treatment unit is subjected to the following processes prior to dispensing for usage:

- Pumping station output @ 790 gallons/hr. (3.0 m^3/hr.)
- Primary oxidation—chlorination
- Mechanical filtration
- Sand filtration
- Ultrafiltration
- Rechlorination
- Activated carbon treatment
- UV disinfection
- Final chlorination
- Water storage (3,500-gallon capacity tanks)
- Drinking water dispensing system (16 timed and solenoid-activated taps)

Water parameters removed by the AquaMobile 3000 System

- Color
- Turbidity
- Algae
- Humic acids
- Odor
- Colloids
- Bacteria
- Chemical oxygen demand (COD)

NOTE The AquaMobile 3000 treatment system has been proven to disinfect water by eliminating a variety of bacterial and protozoal microorganisms.

Power Requirements for System Operation

The AquaMobile 3000 has been designed to function as an autonomous system by utilizing power produced by fuel-powered generators. A fuel storage tank, installed near the fuel power generators, contains enough fuel to operate the generators sustainably over a duration of 14 days.

Monitoring and Operation of the AquaMobile 3000 System

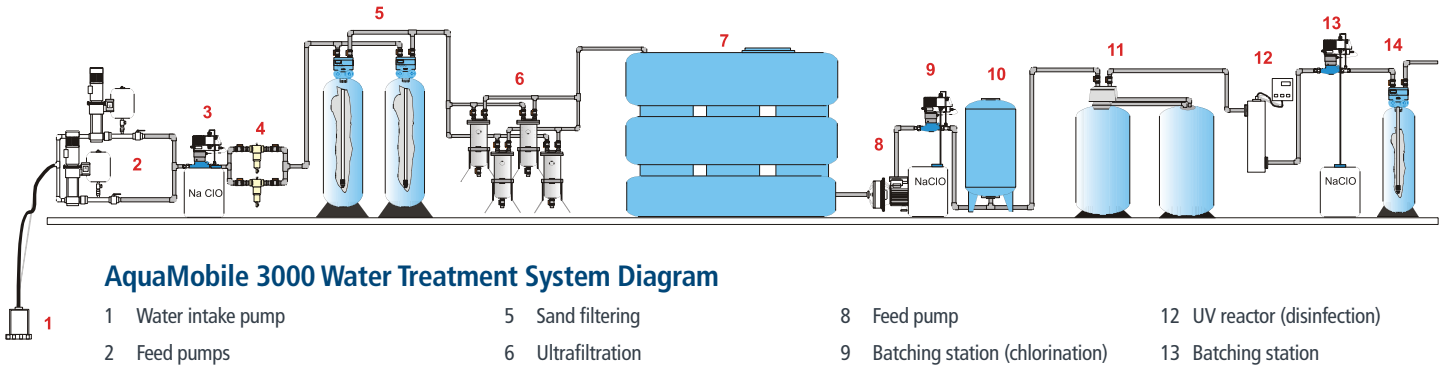
This activity requires the presence of an attendant for five and a half hours that includes morning and afternoon shifts (with 25 minutes of dispensing time per shift).

Operator Responsibilities

- Carries out the backwash operations of the treatment system on a periodic basis
- Monitors the AquaMobile 3000 treatment system to ensure that all unit operations are functioning properly
- Monitors the quality of the water produced to ensure it meets the health quality requirements for public consumption
- Organizes the water dispensing process and its timing
- Drives the semi-trailer truck

Location and Space Requirements

The AquaMobile 3000 treatment system is an integrated mobile system that can be placed in an open space area (parking lot, plaza, park area, etc.). The AquaMobile 3000 treatment system should be placed at a distance of no more than 30 m (100 feet) from the water intake source with a vertical lift of water from the intake of no more than 12 m (40 feet).



AquaMobile 3000 Water Treatment System Diagram

1 Water intake pump
2 Feed pumps
3 Batching station (chlorination)
4 Mechanical filter with backwash function
5 Sand filtering
6 Ultrafiltration
7 Treated water accumulation tank
8 Feed pump
9 Batching station (chlorination)
10 Pressure station
11 Charcoal filtering
12 UV reactor (disinfection)
13 Batching station (final chlorination)
14 Mixing tank

Overall Operation of the AquaMobile 3000 System

The AquaMobile 3000 water treatment system is used to treat water from a surface body source (pond, lake, or river) in order to provide a product suitable for drinking and for domestic use.

Raw water is pumped from the surface water body source into the treatment unit, and following treatment, the water produced is stored in tanks totaling 3,500 gallons in volume and located in the semi-trailer compartment. The treated water meets or exceeds EPA and other governmental quality and health standards.*

Water is then dispensed to the users via a manifold pipe fitted with 16 timer-controlled dispensing taps (8 taps on each of the semi trailer). The dispensing system allows water to be distributed to 403 users on a daily basis (with daily operation of the AquaMobile 3000 treatment system for a total of 7.2 hours per day).

Each user will receive 50 liters (13 gallons) of potable water per day. The volume of 25 liters (6.5 gallons) is dispensed in the morning and 25 liters (6.5 gallons) is dispensed later in the afternoon. A 5-gallon (19-liter) water collection container is distributed to each user and is carried by the user for daily use.

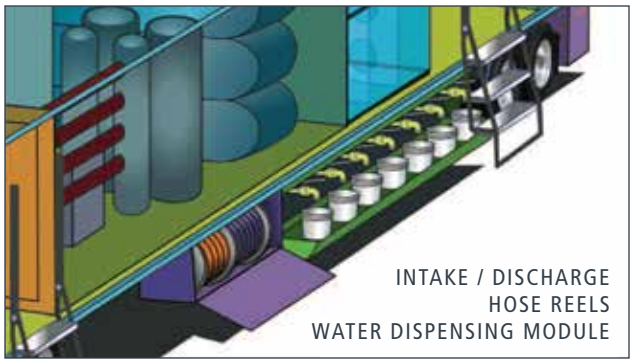
The AquaMobile 3000 dispensing unit has the capability of dispensing stored treated water to 16 users simultaneously. The objective is to allow all 403 users to fill their water collection containers during a 25-minute period in the morning and during a 25-minute period in the late afternoon.

This system is fully scalable to meet the needs and specific requirements of the customer and has the capability of treating, storing, and dispensing potable water to 807 users per day at 6.5 gallons per day per person, or can dispense potable water for up to 403 users per day (with a two-trip operation, each including pumping, treatment and dispensing operations).

The water collection containers distributed to the users are stored in a specially designed compartment.

AquaMobile 3000 Has the Following Unique Features

- It has the ability to collect, store, treat, deliver, and dispense water to areas remote from the water source
- It has built-in timer-controlled water dispensing and conveyance systems
- It is ready for immediate start-up upon arrival to the site
- It is a low-maintenance and simple-to-operate system
- The units inside the trailer compartment are installed for ease of maintenance and repair
- It has an efficient, space-saving design
- It has an integrated, autonomous, power generation system
- It has a clean, quiet and efficient water treatment operation (65-72 decibels for generators with sound shields)
- It includes both tractor and trailer systems
- It includes a separate clean and low-noise operating generator (3°dB) to provide the necessary power for lighting and water dispensing
- It includes retractable trailer sides that can serve as a protective awning during inclement weather conditions
- It is affordably priced
- It is adaptable to various geographical conditions



* AquaMobile 3000 has been designed in conformance with the American Water Works Association (AWWA) and American Society for Testing and Materials (ASTM) standards.

NOTE AquaMobile 3000 is designed for long term applications where potable water will need to be supplied autonomously for a time period of two weeks.

AquaMobile 3000 Technical Features

The AquaMobile 3000 treatment system uses space-saving, energy-efficient components to deliver a maximum capacity output of fresh water from a compact system design. This is achieved in an efficient manner under emergency conditions where time is of the essence. AquaMobile 3000 comprises several modules engineered to fit into a semi-tractor trailer.

These modules include:

The water intake system includes an influent submersible pump that delivers water to the AquaMobile 3000 from an existing surface water source such as a lake, pond, or river. The pump is capable of delivering water from the source up to the treatment system with a total lift of 12 m (40 feet). The intake pipe is estimated to be 30 m (100 ft) long and is usually stored along with the submersible pump cable in a reel assembly when the system is not in operation. A discharge pipe, also rolled into a reel, allows for the discharge of reject water from the treatment system to a distance of approximately 30 m (100 ft). Booster pumps would need to be added to the intake lines under conditions where the intake pipe is longer than 30 m (100 ft) or when lifts greater than 12 m (40 ft) are necessitated due to challenging topographic conditions.

The water treatment module comprises a combination of treatment technologies that include oxidation, filtration, ultrafiltration and sorption. These technologies are used in tandem to achieve superior results. The pumped incoming water is processed in the treatment module and is disinfected prior to its transfer into the water storage module's accumulation tank. (AquaMobile 3000 water treatment systems are not intended for use in treating water that contains low molecular weight organic pollutants, nitrates or dissolved inorganic salts).

The water storage module consists of two accumulation tanks equipped with a water level scale and a total storage capacity of 3,500 gallons (13.2 m^3) of potable water. The water storage tanks are designed for safe water transportation from the source to the dispensing location. It is equipped with a water overflow feature that allows the excess water to be released from the tank during fill-up operations. The water storage tanks also conform to applicable Environmental Protection Agency (EPA) and American Water Works Association (AWWA) standards for access operation and maintenance. They also conform to the American Society of Mechanical Engineers (ASME) Specifications for the Construction of Food Grade Vessels.

The water collection containers, totalling 1,568 empty 5-gallon (19-liter) water collection containers, are stacked in a compact fashion when the treatment system is not in operation. The containers are easily accessible for distribution to the potable water users during water dispensing operations.

The water dispensing module in the AquaMobile 3000 system comprises two water dispensing units, one on each side of the trailer. Each dispensing unit includes a manifold that connects to the water storage tank on one side and to water dispensing taps on the other (8 taps are located on each side of the trailer). In order to reduce water spillage, each of the dispensing valves is programmed to release the required volume of water using a centrally located control. The water dispensing module is securely stowed in a separate compartment under the semi-tractor trailer when the AquaMobile 3000 treatment system is not in operation. The entire compartment of the permanently installed water dispensing module swings open to allow for the tapping of drinking water by the users. This is done by placing a water collection container on a platform under the tap and by allowing a time controlled solenoid valve to dispense a specific amount of water within a specific time interval.

The fuel power generator module provides power for the AquaMobile 3000 system operation. This module has a fuel storage tank associated with it that allows for continuous system operation over the duration of two weeks. The electric generators also have a self-fueling capability. The power generation module is designed for ease of maintenance by providing ample space around the unit. A second power generator provides power for the lighting fixture and power-requiring accessories that are not a component of the water treatment system.

The chemical and material storage modules are designed with enough space to allow adequate storage of chemicals used daily for a two week operation period. Furthermore, the storage modules are designed to ensure the proper storage and containment of chemicals, thus preventing spillage and contamination of adjacent areas (the containment area meets chemical storage requirements according to the U.S. Code of FederaL Regulations (40 CFR 264.175)).

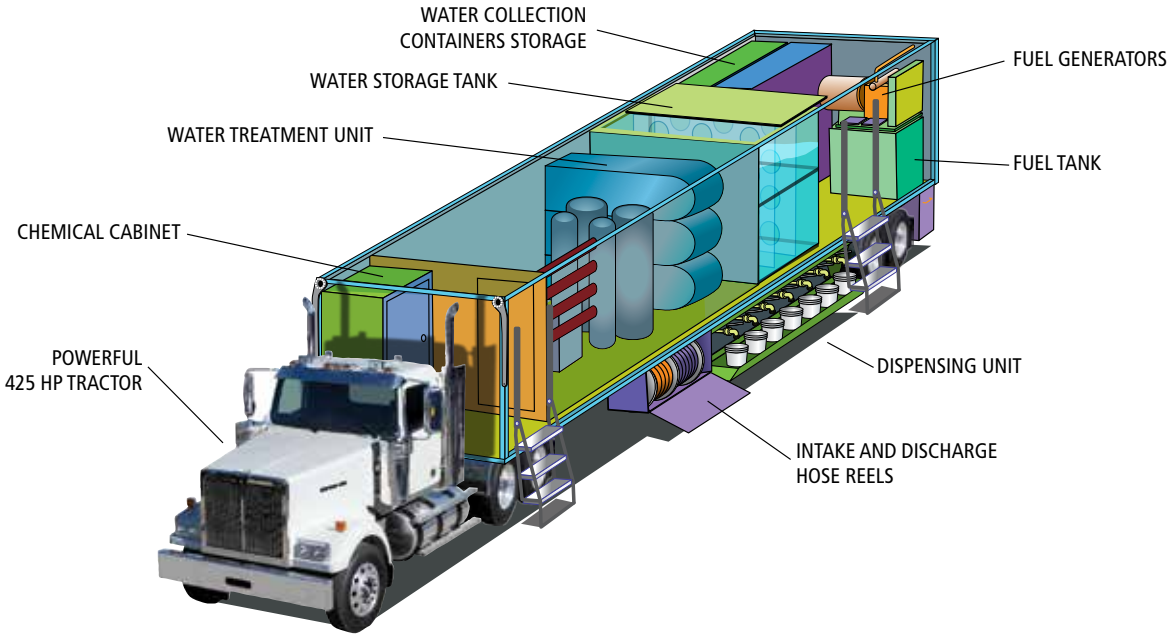
Specifications

TREATMENT MODULE

Dimensions (L x W x H)	41 ft x 8.4 ft x 9 ft clear height (12.5 m x 2.5 m x 2.8 m clear height)
Shipping load	13,200 lb (6 metric tons)
Operating load	17,600 lb (8 metric tons)

COMBINED TRUCK/TREATMENT MODULES

Dimensions (L x W x H)	69.8 ft x 8.5 ft x 13.5 ft clear height (18.5 m x 3.6 m x 4.1 m clear height)
Shipping load	52,500 lb (23.8 metric tons)
Operating load	82,600 lb (37.5 metric tons)
Feed water	13.2 gpm (3 m^3/hr) intake capacity
Product water	16 taps for output @ 3.6 gpm/tap (16 taps for output @ 0.8 m^3/tap/hr)
Drain	Backwash water – quantity = function of frequency of backwash
Electrical requirements	Self-contained fuel power generator
Certification	ISO 9001



AquaMobile 3000 Semi-Tractor Trailer Features

The AquaMobile 3000 treatment system is contained within a 41-foot trailer unit, which is pulled by a semi-tractor manufactured by Volvo Trucks and fitted with a powerful 425 HP Volvo engine. The following considerations were made in selecting the semi-tractor trailer system:

- Volvo Trucks is a reliable manufacturer that offers a large number of service centers worldwide.
- Meets standards and certification requirements for EPA / Carbon Emissions.
- The semi-tractor is equipped with a comfortable sleeper for the driver/ operator.
- The semi-tractor trailer is capable of reaching a maximum speed of 87 MPH.
- The trailer is of a special design to accommodate hydraulically operated retractable side walls that fold up to 180 degrees, and can be positioned to serve as awnings to protect users from the elements during water dispensing operations.
- This unique trailer was designed for ultra-efficient operation which allows each of the two sided walls to slide open within 20 seconds via remote control command.
- Accessibility of components through the open trailer sides allows for easy serviceability and/or replacement and fastening of equipment modules.
- Retractable trailer side walls offer easy access to carry out various types of maintenance, as well as restocking of consumables, such as chemicals, power generator fuel, water containers, etc.
- A total of 1,568 water collection containers (5 gallon/19 liter capacity) are stored inside the trailer and are ready for distribution.
- Stowable ladders allow easy access to the trailer compartment. One foldable ladder is located at the front of the trailer to allow access to the chemical storage compartment, the second ladder is located at the back of the trailer and is used for filling the fuel storage tank and for servicing the electric power generator.
- Trailer support legs are located at approximately 12 feet from the front of the trailer and allow for the semi-tractor disengagement.
- Optional heating and insulated pipes are offered in regions where treatment, storage, and distribution are to be conducted under freezing conditions.
- A trailer design is available that meets the State of California (Caltrans) regulations.

AQUALTRA™ TECHNOLOGIES

info@aqualtra.com | www.aqualtra.com
3838 OAK LAWN AVENUE | SUITE 1000 | DALLAS TEXAS 75219 | 972.971.9755 PHONE | 469.317.6301 FAX