Water Trucking

Response Phase	Application Level	Management Level	Objectives / Key Features
** Acute Response * Stabilisation Recovery	Household ** Neighbourhood * City	Household * Shared ** Public	Short-term, bulk transport of water using vehicles
Local Availability	**Technical Complexity**	**Maturity Level**	
*** High	** Medium	*** High	

Water Trucking (or water tankering) refers to the bulk transport of water from the source to a storage facility near a distribution point. During the acute and stabilisation phases of an emergency, these trucks may be used to provide short-term transport of water to communal water points.

Water Trucking is done using a tanker vehicle. This service may already exist in non-emergency conditions in the form of a distributing Water Vendor **(D.2)**. In emergencies, these trucks may be diverted as a short-term (and costly) transport option for moving large quantities of water.

Design Considerations: Where Water Trucking is considered for an emergency, it is important to keep in mind that a portion of the population may already rely on this as a water source and diverting these trucks for emergency supplies could have unintended negative consequences for existing users. In some cities or semi-arid areas, this can be a significant proportion of the population, with both household resellers and Water Kiosks **(D.4)** relying on Water Trucking for their supply.

The purpose of emergency Water Trucking is to provide an immediate water supply. If possible, Water Trucking should be avoided or used for as short a period as possible, as it has a high ongoing cost and can be difficult to organise. It should only be done if there are no alternatives (e.g. pumps and pipelines or treating a source closer to population), and in this case, it should be a short-term measure while other water supplies are developed (note that these other supplies should already be planned for during the acute phase). If there are no alternative water sources that can be developed to supply a community relying on Water Trucking, it may be preferable to relocate people where this is an option. Where neither is possible for political or security reasons (as is the case in some emergency scenarios), Water Trucking might be the only option that has to be continued, but it comes at a great expense.

Water tankers vary in size (5–20 m^3) and form (e.g. vehicle with integrated tank or tank pulled by a tractor). Tankers that previously carried non-food grade liquids (e.g. fuel) should never be used. A tanker should be easily cleanable, have a lockable cover and an air vent that is screened to keep out animals and insects. The number of tankers required must be calculated based on the time needed to fill and offload water, the return journey time and the number of working hours in a day (working at night might not be possible), while factoring in 30 % extra for contingencies. An extra tanker should be used to cover repair/maintenance and allow for driver rest days. Where there are not

enough available tankers, improvised Trucking can also be done using flatbed trucks with rigid or flexible tanks attached. Care should be taken in driving these, as they can be unstable due to water movement in the tanks during transport.

Water Trucking can be managed in-house or contracted out. Either way, it needs to be well organised, so having reliable supervisors is essential. Contracts should be based on the volume delivered, not time spent. A monitoring system to record deliveries needs to be agreed upon, which could also include real-time technical solutions for remote monitoring of tanks. It should also be clear who supplies and pays for various consumables (e.g. fuel and oil, maintenance, insurance). Where fuel supply is not reliable, consider a fuel store. The route needs to be surveyed from the source to delivery point to identify any potential difficulties (e.g. river crossings and bridge weight restrictions, road surface issues, effect of weather). Also, the use of a water source may need prior clearance from relevant authorities before it can be used. Water Trucking will only work efficiently where there is enough storage to offload into, although in some acute emergencies, people might need to collect directly from the tanker until storage tanks are installed. In such a situation, it is important to properly organise how people queue by creating a walking circuit. Offloading can be done by gravity (where the height of the receiving tank is restricted) or pumping (preferable, since offloading can then be quicker).

Materials: Materials needed include the tankers, preferably with offloading pumps. Improvised water tankers will require a separate tank with an attachment mechanism to the truck or trailer and a filling and emptying facility (see Water Storage Tanks, **D.5 and D.6**). Likewise, proper vehicle maintenance and cleaning facilities are essential to effectively operate Water Trucking services.

Applicability: As Water Trucking is an expensive method of providing potable water, it is most suitable for the acute response and possibly for the stabilisation phase. By the time of the recovery phase, another water source should ideally have been developed to replace Water Trucking.

Operation and Maintenance: Water supplied by tankers must be safe. This is ensured through an initial cleaning and disinfection procedure, as well as through ongoing chlorination. Cleaning and disinfection can be done using a brush, detergent and hot water, followed by shock chlorination for 24 hours **(see T.6)**, and hoses can be disinfected by recirculating water to the tank using the pump. After this, drinking water will be chlorinated at a lower dose (according to jar test, **see T.6**). For this, chlorine is normally added during filling, which usually gives adequate contact time before delivery and ensures good mixing. It should be clear who is responsible for chlorination, and the details must be recorded in a logbook. Trucks themselves (and offloading pumps) will also require maintenance, so it should be clear in the contract who is responsible for this and whether there are locally available spares. The quality and quantity of delivered water must be monitored. For this, the community must be involved as they have a vested interest in ensuring that safe and sufficient water is delivered.

Health and Safety: Cleaning water tankers can be dangerous due to slippery surfaces and hazardous gases given off from previous liquids held in the tank. The health risks to workers cleaning the tanker can be reduced by blowing compressed air into the tanker outlet while the inlet cover is open. Cleaners should have protective clothing, gloves, boots, hat, mask and goggles and, if available, a safety harness and rope. Ensure a monitor remains outside the tank in case the cleaner has an accident. Care should be taken about how and where detergent and strong chlorine is disposed of during cleaning (preferably a sewer, but never in a river or on cultivated land). Improvised tankers using portable storage tanks can also be dangerous if the tanks are not properly attached. The biggest safety issue is the vehicle and how it is driven, as driving a full tanker truck can be hazardous in the event of emergency braking or sharp curves. Around water points, there is major potential for accidents with children and other users waiting for water. Properly trained drivers are essential, but may be difficult to find in emergencies.

Costs: The median mark-up of vendor water from many studies shows that it is about eight to ten times that of water from piped connections, but varies greatly by region (variation from around 1.5–18 USD per m^3 in different countries). In emergencies, however, it is likely to be free due to government or donor subsidies.

Social and Environmental Considerations: Water Trucking tends to be well accepted by people, but this may not be the case where trucks are diverted from existing work for an emergency, causing some people to lose their water supply. Water trucks should be properly maintained to assure that pollution from exhaust gases and associated health risks are limited as much as possible.

Strengths and Weaknesses:

⊕ Can provide an immediate supply
⊕ Can transport large quantities of water

⊖ Has high cost, making it suitable only in the short term
⊖ The high cost is not reflected in an investment in the local water source
⊖ Needs good supervision and monitoring to ensure water is delivered
⊖ Might divert trucks from existing work, meaning some people may lose water supply

→ **References and further reading material for this technology can be found on page 219**