Wastewater Treatment & Re-use

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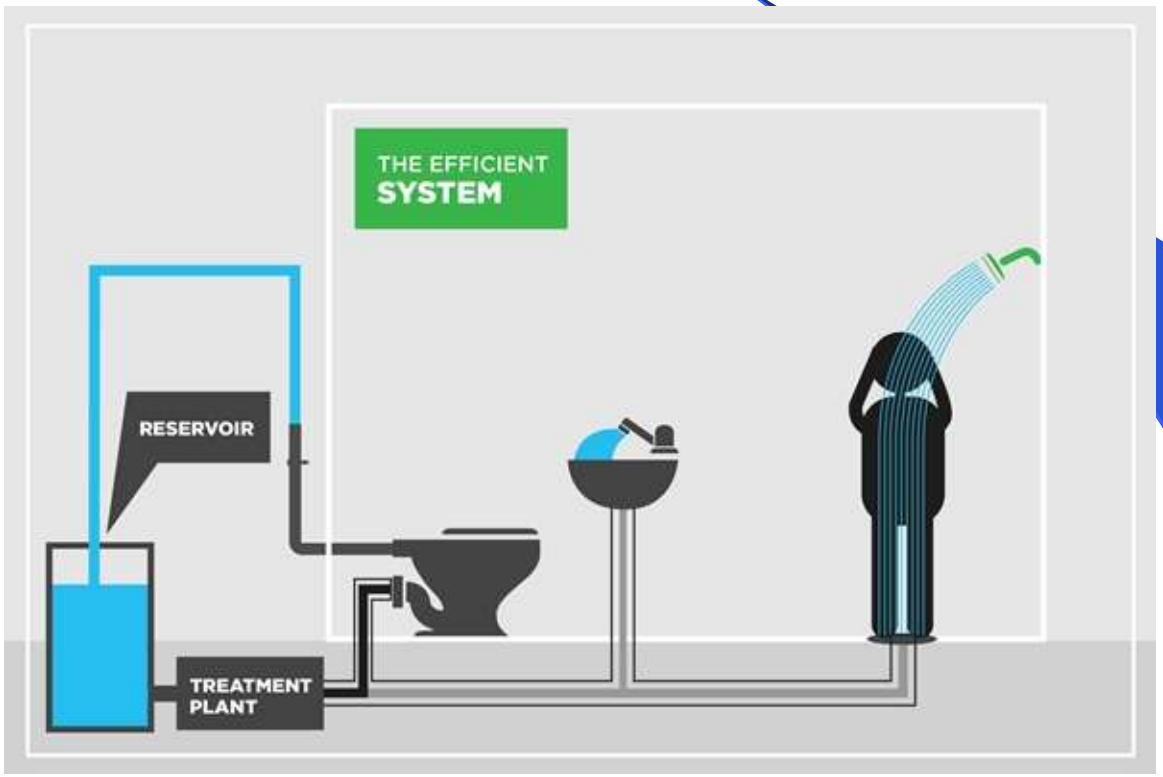
Wastewater Treatment & Re-Use

- Wastewater (sewage) treatment is the process by which organics generally present in domestic sewage are removed, and the end result is a water product (effluent), carbon dioxide and a sludge. Sewage is 99.9% water.

- Wastewater can be treated to produce a 2nd class water that may be used for the flushing of toilets/urinals and for landscaping (though some technologies can provide water for laundries, and swimming pools).



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Wastewater Treatment & Re-Use

There are various sewage treatment systems on the market but all have the following factors in common:

- Temporary storage of sewage (buffer tanks)
- Screening
- Biological Treatment
- Tertiary treatment (filtration and disinfection)
- Temporary storage of treated effluent
- Distribution to 2nd class water users through a dedicated water distribution system

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- There are no universal standards on the quality of 2nd water but water to be used for toilets/urinals is to be free from solids, and have no colour and no smell.
- 2nd class water used for landscaping should be free from chlorine and organics.

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Requirements:

- An adequate supply of wastewater (minimum 100 cubic metres per day)
- An adequate demand of 2nd class water
- Separate distribution systems/pipework for 2nd class water and 1st class water
- A space of 150 m^2 (and 4m high) can be found within the premises, ideally outside and downwind of the occupied premises (for a 100 cubic metre/day system)

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Pros:

- Sustainable, inexpensive source of adequate-quality water that can be used as 2nd class water (estimated cost of treated wastewater, including depreciation - €0.60/cubic metre)
- Reduces vulnerability to water tariffs; cost of production depends on electricity and chemical costs – but electricity costs generally lower than for seawater RO
- Demand generally matches supply (except for cases where landscaping water demand is high, as this is seasonal)
- Offsets any wastewater tariffs

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Cons:

- Requires significant capital investment, depending on the choice of technology
- Requires considerable space
- May require the installation of a 2nd class water supply system
- May result in poor quality water (and complete system shutdown in extreme cases) if the system is not adequately designed, operated and maintained
- Technical expertise is generally required for maintenance
- Sludge has to be carted away at regular intervals

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Most suitable:

- For situations where 2nd class water demand is very high
- For situations where a separate distribution system for 2nd class water already exists (e.g. a hotel currently using seawater for the flushing of toilets)
- For situations where the consumer is paying a high price of water (and a sewage tariff exists), or is using an illegal source of water (seawater, or borehole water) for the flushing of toilets

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Most suitable where:

- Rainwater harvesting is not an option, or does not provide sufficient amounts of 2nd class water
- Bowser water imports are difficult/inconvenient
- Water consumers that are not close to the coast and therefore cannot make use of desalination (RO) as a source of 2nd class water

Use of Municipal Wastewater Effluent