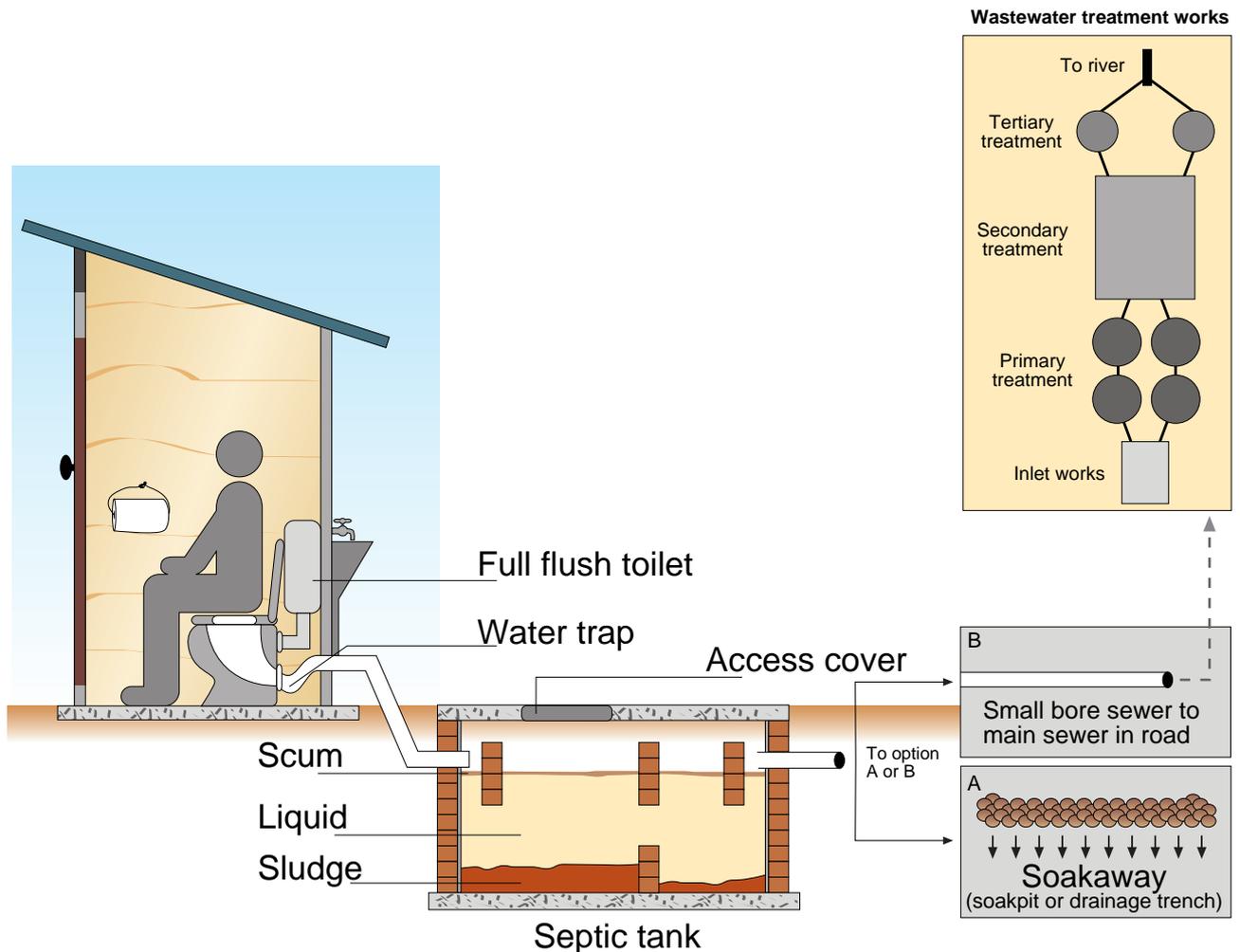


Septic tank and soakaway or small bore solid-free sewer



Septic tank and soakaway: An in-house full flush-toilet connected via pipe and plumbing fixtures to an underground watertight settling chamber (the 'digester') with a liquids outlet to a subsoil drainage/soakaway system.

Small bore solid-free sewer: An in-house toilet discharging to a septic tank (or on-site digester) with liquids disposal via a small diameter sewer to a central collection sump or existing sewer system.

Principles of operation	Operational and institutional requirements	Costs	Experience and comment
<p><i>Septic tank and soakaway</i> Waste from the toilet, and generally domestic wastewater, is flushed into the settling chamber where it is retained for at least 24hrs to allow settlement and biological digestion. Partially treated liquids then pass out of the tank and into the subsoil drainage/soakaway system. Digested sludge gradually builds up in the tank and requires eventual removal by tanker.</p>	<p>Requires a reliable household water connection. Specific design criteria must be applied to the settlement tank and soakaway system. This option is applicable only in areas of low settlement density and where soils have a high ability to drain effluent away. Ensure access for emptying of tanks by vacuum tanker, as well as availability of sludge treatment and disposal.</p>	<p>Capital: R7 000-R8 500. Operating: R200-R450 per emptying, depending on emptying frequency.</p>	<p>Widely used by formal rural households and farming areas, where reliable water supply is available. Provides a high level of service and user convenience. Failures due to poor design and construction, and use of inappropriate anal cleansing material. Soakaway system is particularly prone to failure in the long-term if detailed soil testing is not carried out.</p>
<p><i>Small bore solid-free sewer</i> As for the septic tank and soakaway except that the liquid effluent is conveyed by a system of small-diameter pipes to a communal treatment point (which may be off-site treatment works reached either via existing sewerage or by tanker).</p>	<p>Although its water requirements may be less than those of a septic tank and soakaway, a household connection is needed. Ensure access for emptying of septic tank, as well as availability of sludge treatment and disposal. Routine maintenance of pipe network essential.</p>	<p>Within the septic tank and soakaway range detailed above if septic tank systems already in place, otherwise capital cost much higher.</p>	<p>Not widely used in South Africa, except where existing septic tank and soakaway systems have been converted for convenience and/or environmental reasons. Failures as for septic tanks above, and due to lack of maintenance of the pipe network.</p>