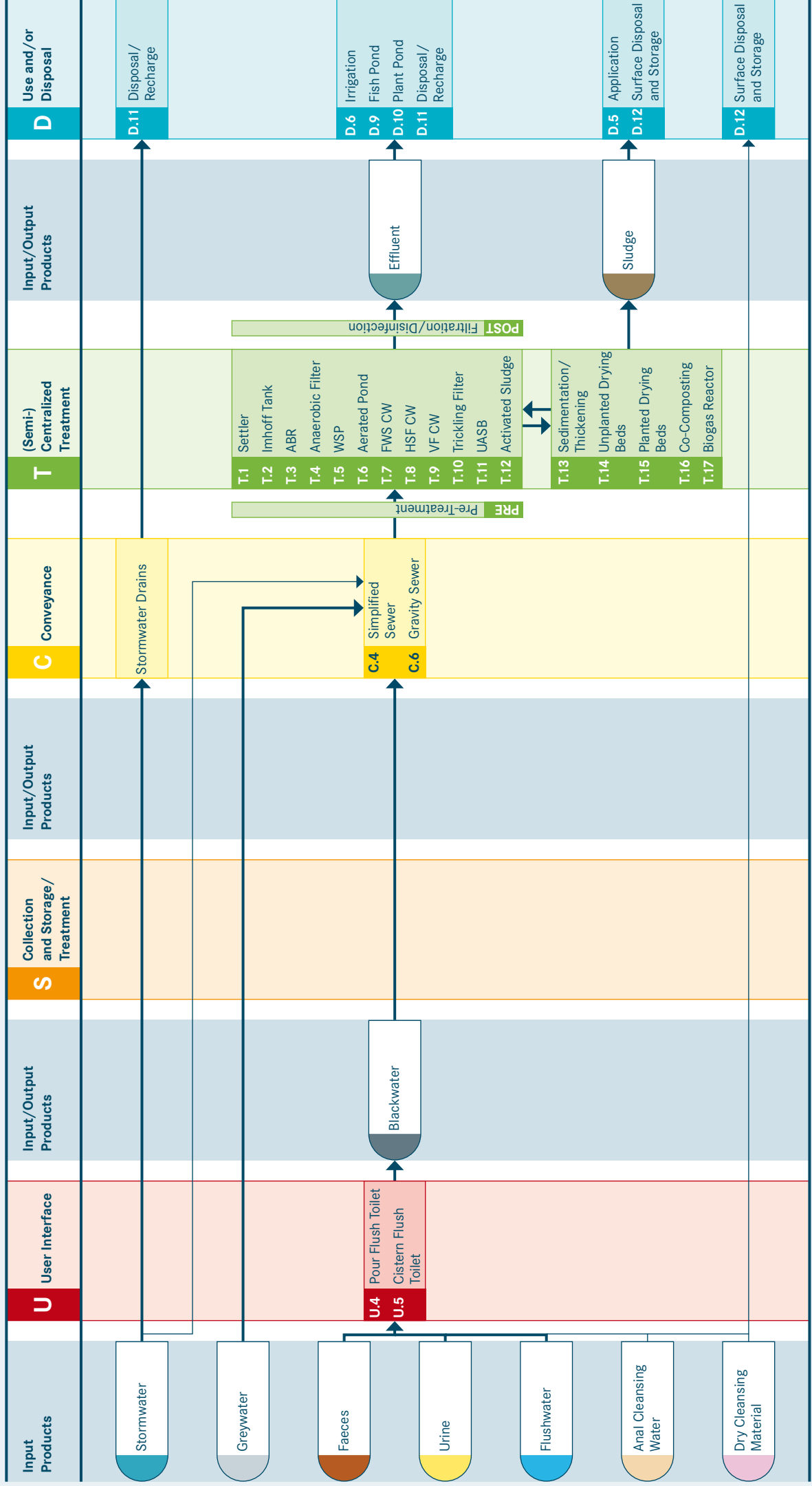
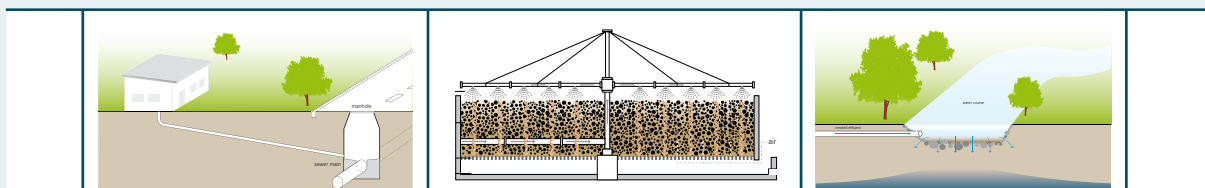


Sanitation System 8: Blackwater Transport to (Semi-) Centralized Treatment System



System 8: Blackwater Transport to (Semi-) Centralized Treatment System



This is a water-based sewer system in which Blackwater is transported to a Centralized or Semi-Centralized Treatment facility. The important characteristic of this system is that there is no Collection and Storage/Treatment. Inputs to the system include Faeces, Urine, Flushwater, Anal Cleansing Water, Dry Cleansing Materials, Greywater and possibly Stormwater.

There are two User Interface technologies that can be used for this system: a Pour Flush Toilet (U.4) or a Cistern Flush Toilet (U.5). A Urinal (U.3) could additionally be used. The Blackwater that is generated at the User Interface together with Greywater is directly conveyed to a (Semi-) Centralized Treatment facility through a Simplified (C.4) or a Conventional Gravity Sewer network (C.6).

Stormwater could also be put into the Gravity Sewer network, although this would dilute the wastewater and require Stormwater overflows. Therefore, local retention and infiltration of Stormwater or a separate drainage system for rainwater are the recommended approaches.

As there is no Collection and Storage/Treatment, all of the Blackwater is transported to a (Semi-) Centralized Treatment facility. The inclusion of Greywater in the Conveyance technology helps to prevent solids from accumulating in the sewers.

A combination of the technologies T.1-T.12 is required for the treatment of the transported Blackwater. The Sludge generated from these technologies must be further treated in a dedicated Sludge treatment facility (technologies T.13-T.17) prior to Use and/or Disposal.

Options for the Use and/or Disposal of the treated Effluent include Irrigation (D.6), Fish Ponds (D.9), Floating Plant Ponds (D.10) or discharge to a water body (Water Disposal/Groundwater Recharge, D.11). After adequate treatment, Sludge can either be used in agriculture (D.5) or brought to a Storage/Disposal site (D.12).

Considerations This system is especially appropriate for dense, urban and peri-urban settlements where there is little or no space for onsite storage technologies or emptying. The system is not well-suited to rural areas with low housing densities. Since the sewer network is (ideally) watertight, it is also applicable for areas with high groundwater tables. There must be a constant supply of water to ensure that the sewers do not become blocked.

Dry Cleansing Materials can be handled by the system or they can be collected and separately disposed of (e.g., Surface Disposal, D.12).

The capital investment for this system can be very high. Conventional Gravity Sewers require extensive excavation and installation that is expensive, whereas Simplified Sewers are generally less expensive if the site conditions permit a condominal design. Users may be required to pay user fees for the system and its maintenance. Depending on the sewer type and management structure (Simplified vs. Conventional, city-run vs. community-operated) there will be varying degrees of operation or maintenance responsibilities for the homeowner.

This system is most appropriate when there is a high willingness and ability to pay for the capital investment and maintenance costs and where there is a pre-existing treatment facility that has the capacity to accept additional flow.

Guidelines for the safe use of Effluent and Sludge have been published by the World Health Organization (WHO) and are referenced on the relevant technology information sheets.