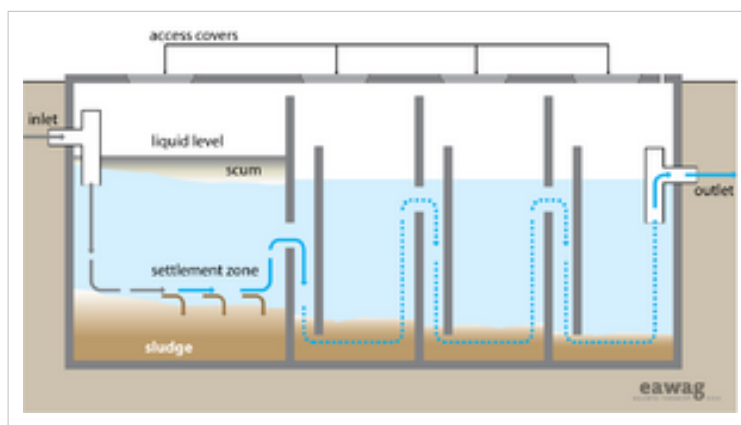


Anaerobic_Baffled_Reactor

Application level		Management level	
Household	XX	Household	XX
Neighbourhood	XX	Shared	XX
City		Public	XX



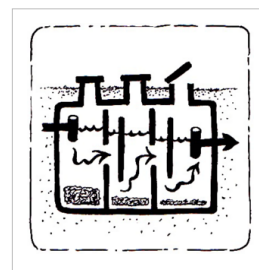
Applicable to systems:	Languages / langues / idiomas		
5, 6			

Inputs: Blackwater , Greywater

Outputs: Faecal Sludge , Effluent

An Anaerobic Baffled Reactor (ABR) is an improved septic tank because of the series of baffles under which the wastewater is forced to flow. The increased contact time with the active biomass (sludge) results in improved treatment.

The majority of settleable solids are removed in the sedimentation chamber at the beginning of the ABR, which typically represents 50 % of the total volume. The upflow chambers provide additional removal and digestion of organic matter: BOD may be reduced by up to 90 %, which is far superior to that of a conventional septic tank. As sludge is accumulating, desludging is required every 2 to 3 years. Critical design parameters include a hydraulic retention time (HRT) between 48 to 72 hours, up-flow velocity of the wastewater less than 0.6 m/h and the number of up-flow chambers (2 to 3).



Advantages	Disadvantages/limitations
<ul style="list-style-type: none"> - Resistant to organic and hydraulic shock loads. - No electrical energy required. - Greywater can be managed concurrently. - Can be built and repaired with locally available materials. - Long service life. - No real problems with flies or odours if used correctly. - High reduction of organics. - Moderate capital costs, moderate operating costs depending on emptying; can be low cost depending on number of users. 	<ul style="list-style-type: none"> - Requires constant source of water. - Effluent require secondary treatment and/or appropriate discharge. - Low reduction pathogens. - Requires expert design and construction. - Pre-treatment is required to prevent clogging.

Adequacy

This technology is easily adaptable and can be applied at the household level or for a small neighbourhood.

An ABR can be designed for a single house or a group of houses that are using a considerable amount of water for clothes washing, showering, and toilet flushing. It is mostly appropriate if water use and supply of wastewater are relatively constant.

This technology is also appropriate for areas where land may be limited since the tank is installed underground and requires a small area. It should not be installed where there is a high groundwater table as infiltration will affect the treatment efficiency and contaminate the groundwater.

Typical inflows range from 2,000 to 200,000L/day. The ABR will not operate at full capacity for several months after installation because of the long start up time required for the anaerobic digestion of the sludge. Therefore, the ABR technology should not be used when the need for a treatment system is immediate. To help the ABR to start working more quickly, it can be 'seeded', i.e. active sludge can be introduced so that active bacteria can begin working and multiplying immediately. Because the ABR must be emptied regularly, a vacuum truck should be able to access the location. ABRs can be installed in every type of climate although the efficiency will be affected in colder climates.

Health Aspects/Acceptance

Although the removal of pathogens is not high, the ABR is contained so users do not come in contact with any of the wastewater or disease causing pathogens. Effluent and sludge must be handled with care as they contain high levels of pathogenic organisms. To prevent the release of potentially harmful gases, the tank should be vented.

Maintenance

ABR tanks should be checked to ensure that they are watertight and the levels of the scum and sludge should be monitored to ensure that the tank is functioning well. Because of the delicate ecology, care should be taken not to discharge harsh chemicals into the ABR. The sludge should be removed annually using a vacuum truck to ensure proper functioning of the ABR.

Acknowledgements

The material on this page was adapted from: Tilley, E. et al. (2008). Compendium of Sanitation Systems and Technologies ^[2], published by Sandec ^[3], the Department of Water and Sanitation in Developing Countries of Eawag ^[4], the Swiss Federal Institute of Aquatic Science and Technology, Dübendorf, Switzerland. The publication is available in English, French, and will be made available in Spanish. Available in the IRC Digital Library ^[5]

References and external links

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 - [2] http://www.eawag.ch/organisation/abteilungen/sandec/publikationen/publications_sesp/downloads_sesp/compendium_high.pdf
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 - [4] http://www.eawag.ch/index_EN
 - [5] <http://www.irc.nl/docsearch/title/163208>
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