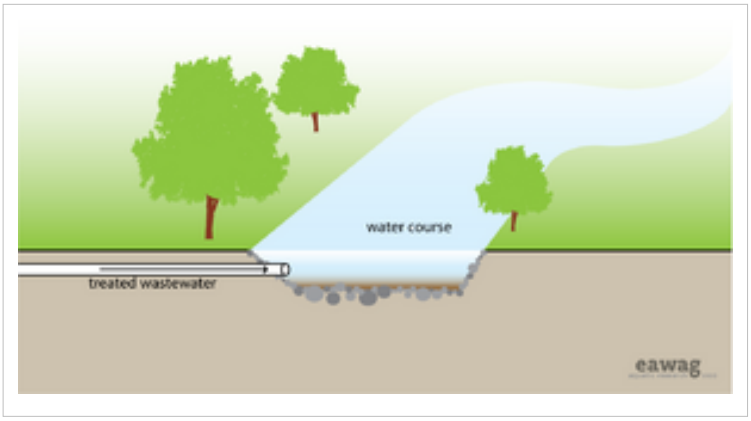
Water_Disposal_-_Groundwater_Recharge

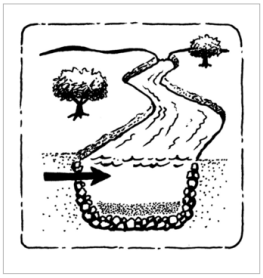
Application level		Management level	
Household	XX	Household	XX
Neighbourhood	XX	Shared	XX
City	XX	Public	XX



Applicable to systems:	Languages / langues / idiomas
1, 2 , 3 , 4 , 5 , 6 , 7	

Inputs: Effluent , Stormwater

Outputs: -



Treated effluent and/or stormwater can be discharged directly into receiving water bodies (such as rivers, lakes, etc.) or into the ground to recharge aquifers.

It is necessary to ensure that the assimilation capacity of the receiving water body is not exceeded, i.e. that the receiving body can accept the quantity of nutrients without being overloaded. Parameters such as turbidity, temperature, suspended solids, BOD, nitrogen and phosphorus (among others) should be carefully controlled and monitored before releasing any water into a natural body. The use of the water body, whether it is used for industry, recreation, spawning habitat, etc., will influence the quality and quantity of treated wastewater that can be introduced without deleterious effects.

Local authorities should be consulted to determine the discharge limits for the relevant parameters as they can vary widely. For especially sensitive areas, chlorination may be required to meet microbiological limits. Alternatively, water can be discharged into aquifers. Groundwater recharge is increasing in popularity as groundwater resources deplete and as saltwater intrusion becomes a greater threat to coastal communities. Although the soil is known to act as a filter for a variety of contaminants, groundwater recharge should not be viewed as a treatment method. Once an aquifer is contaminated, it is next to impossible to reclaim it. The quality of water extracted from a recharge aquifer is a function of the quality of the wastewater introduced, the method of recharge, the characteristics of the aquifer, the residence time, the amount of blending with other waters and the history of the system. Careful analysis of these factors should precede any recharge project.

Advantages	Disadvantages/limitations
- May provide a 'drought-proof' water supply (from groundwater). - May increase productivity of water-bodies by maintaining constant levels.	- Discharge of nutrients and micropollutants may affect natural water bodies and/or drinking water. - Introduction of pollutants may have long-term impacts. - R May negatively affect soil and groundwater properties.

Adequacy

The adequacy of discharge into a water body or aquifer will depend entirely on the local environmental conditions and legal regulations. Generally, discharge to a water body is only appropriate when there is a safe distance between the discharge point and the next closest point of use. Similarly, groundwater recharge is most appropriate for areas that are at risk from salt water intrusion or aquifers that have a long retention time. Depending on the volume, the point of discharge and/or the quality of the water, a permit may be required.

Health Aspects/Acceptance

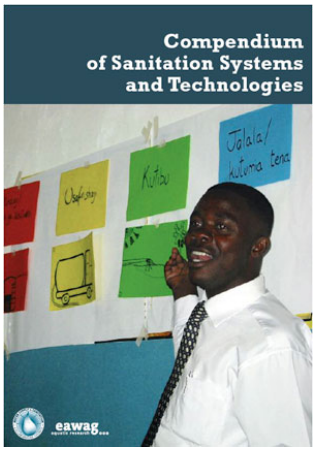
Generally, cations (Mg2+, K+, NH4 +) and organic matter will be retained within a solid matrix, while other contaminants (such as nitrates) will remain in the water. There are numerous models for the remediation potential of contaminants and microorganisms, but predicting downstream, or extracted water quality for a large suite of parameters is rarely feasible. Therefore, potable and non-potable water sources should be clearly identified, the most important parameters modelled and a risk assessment completed.

Maintenance

Regular monitoring and sampling is important to ensure compliance with regulations and to ensure public health requirements. Depending on the recharge method, some mechanical maintenance may be required.

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]



Download the Eawag Compendium of Sanitation Systems and Technologies! [1]

References and external links

- ARGOSS (2001). Guidelines for assessing the risk to groundwater from on-site sanitation. British Geological Survey Commissioned Report, CR/01/142. Available: http://www.worldbank.org
- Seiler, KP. and Gat, JR. (2007). Groundwater Recharge from Run-off, Infiltration and Percolation. Springer, The Netherlands.
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- WHO (2006). Guidelines for the safe use of wastewater, excreta and greywater- Volume 3: Wastewater and excreta use in aquaculture. WHO, Geneva.

References

[1] http://www.eawag.ch/organisation/abteilungen/sandec/publikationen/compendium_e/index_EN

[2] http://www.eawag.ch/organisation/abteilungen/sandec/publikationen/publications_sesp/downloads_sesp/compendium_high.pdf

[3] http://www.eawag.ch/organisation/abteilungen/sandec/index_EN

[4] http://www.eawag.ch/index_EN

[5] http://www.irc.nl/docsearch/title/163208

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