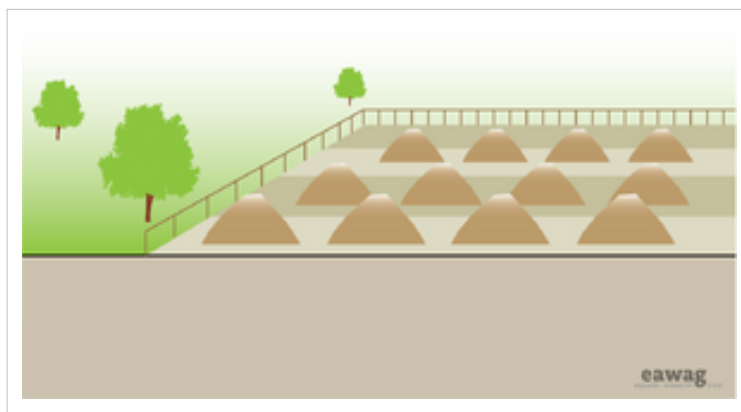


Surface_Disposal

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



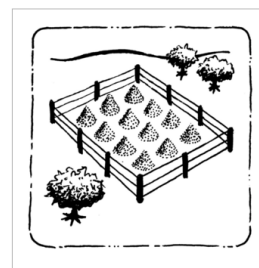
Applicable to systems:	Languages / langues / idiomas		
1, 2, 3, 4, 5, 6, 7, 8			

Inputs: Treated Sludge , Faecal Sludge , Faeces , Dry
Cleansing Material

Outputs: -

Surface Disposal refers to the stockpiling of sludge, faeces, biosolids, or other materials that cannot be used elsewhere. Once the material has been taken to a Surface Disposal site, it is not used later. This technology is primarily used for biosolids, although it is applicable for any type of dry, unusable material.

One application of Surface Disposal that is shown on the System Templates is the disposal of dry cleansing materials, such as toilet paper, corn cobs, stones, newspaper and/or leaves. These materials can not always be included along with other water-based products in some technologies and must be separated. A rubbish bin should be provided beside the User Interface to collect the cleansing materials. Dry materials can be burned (e.g. corn cobs) or disposed of along with the household waste. For simplicity, the remainder of this Technology Information Sheet will be dedicated to faecal sludge, since standard solid-waste practices are beyond the scope of this Compendium.



When there is no demand or acceptance for the beneficial use of biosolids, they can be placed in monofills (biosolids-only landfills) or heaped into permanent piles. The main difference between Surface Disposal and Land Application is the application rate. There is no limit to the quantity of biosolids that can be applied to the surface since there are no concerns about nutrient loads or agronomic rates. There is however, concern related to groundwater contamination and leaching. More advanced surface disposal systems may incorporate a liner and leachate collection system in order to prevent nutrients and contaminants from infiltrating the groundwater.

Landfilling biosolids along with Municipal Solid Waste (MSW) is not advisable since it reduces the life of a landfill which has been designed for the containment of more noxious materials. As opposed to more centralized MSW landfills, Surface Disposal sites can be situated close to where the faecal sludge is treated, limiting the need for long transport distances.

Advantages	Disadvantages/limitations
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<ul style="list-style-type: none"> - Can make use of vacant or abandoned land. - Low cost. - May prevent unmitigated disposal. 	<ul style="list-style-type: none"> - Non-beneficial use of a resource. - Odours are normally noticeable (depending on prior treatment). - May require special spreading equipment. - May require special spreading equipment. - Micropollutants may accumulate in the soil and contaminate groundwater.
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Adequacy

Since there are no benefits gained from this type of disposal technology, it should not be considered as a primary option. However, where acceptance towards biosolid use does not exist, the contained and controlled stockpiling of biosolids is far preferable to uncontrolled dumping. Biosolids can be applied in almost every climate and environment, although they should not be stored where there is frequent flooding or where the groundwater table is high.

Health Aspects/Acceptance

Since the Surface Disposal site is located far from and protected from the public, there should be no risk of contact or nuisance. Care should be taken to protect the disposal site from vermin and from pooling water, both of which could exacerbate smell and vector problems.

Maintenance

Maintenance staff should ensure that only appropriate materials are disposed of at the site, and must maintain control over the traffic and hours of operation.

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

- U.S. EPA (1999). Biosolids Generation, Use, and Disposal in the United States, EPA-530/R-99-009. U.S. Environmental Protection Agency: Washington, D.C. Available: <http://www.epa.gov>
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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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