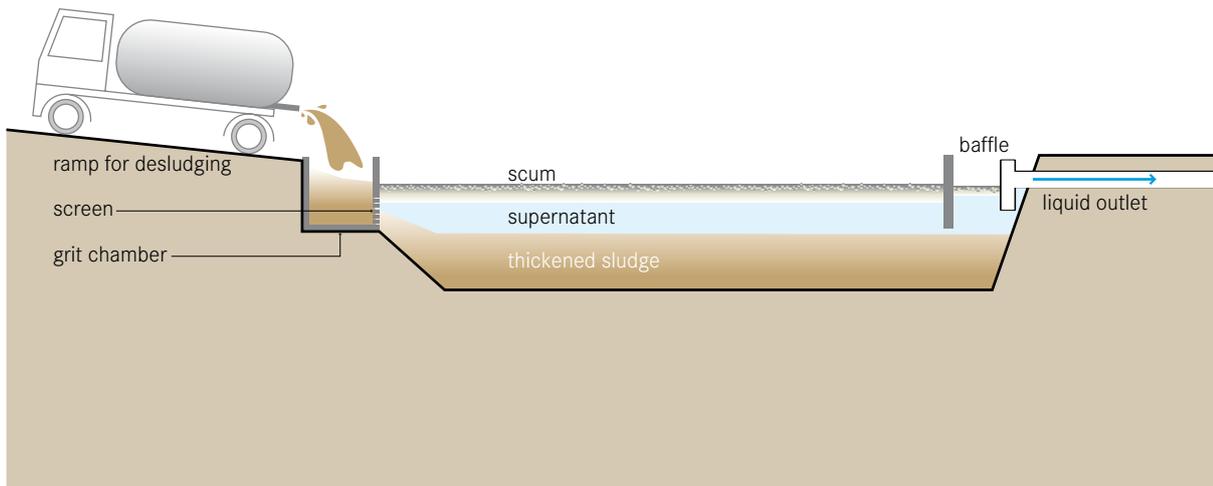


Application Level: <input type="checkbox"/> Household <input checked="" type="checkbox"/> Neighbourhood <input checked="" type="checkbox"/> City	Management Level: <input type="checkbox"/> Household <input type="checkbox"/> Shared <input checked="" type="checkbox"/> Public	Inputs: <input checked="" type="checkbox"/> Sludge
		Outputs: <input checked="" type="checkbox"/> Sludge <input checked="" type="checkbox"/> Effluent



Sedimentation or thickening ponds are settling ponds that allow sludge to thicken and dewater. The effluent is removed and treated, while the thickened sludge can be further treated in a subsequent technology.

Faecal sludge is not a uniform product and, therefore, its treatment must be specific to the characteristics of the sludge. Sludge, which is still rich in organics and has not undergone significant degradation, is difficult to dewater. Conversely, sludge that has undergone significant anaerobic degradation, is more easily dewatered.

In order to be properly dried, fresh sludge rich in organic matter (e.g., latrine or public toilet sludge) must first be stabilized. Allowing the sludge to degrade anaerobically in sedimentation/thickening ponds can do this. The same type of pond can be used to thicken sludge which is already partially stabilized (e.g., originating from Septic Tanks, S.9), although it undergoes less degradation and requires more time to settle. The degradation process may actually hinder the settling of sludge because the gases produced bubble up and re-suspend the solids.

As the sludge settles and digests, the supernatant must be decanted and treated separately. The thickened sludge can then be dried or further composted.

Design Considerations Two tanks operating in parallel are required; one can be operated, while the other is emptied. To achieve maximum efficiency, loading and resting periods should not exceed 4 to 5 weeks, although much longer cycles are common. When a 4-week loading and 4-week resting cycle is used, total solids (TS) can be increased to 14% (depending on the initial concentration).

Appropriateness Sedimentation/thickening ponds are appropriate where there is inexpensive, available space located far from homes and businesses; it should be established at the border of the community. The thickened sludge is still infectious, although it is easier to handle and less prone to splashing and spraying. Trained staff for operation and maintenance is required to ensure proper functioning.

This is a low-cost option that can be installed in most hot and temperate climates. Excessive rain may prevent the sludge from properly settling and thickening.

Health Aspects/Acceptance Both the incoming and thickened sludge are pathogenic; therefore, workers should be equipped with proper protection (boots, gloves, and clothing). The thickened sludge is not sanitized and requires further treatment (at least in a drying process) before disposal or end-use.

The ponds may cause a nuisance for nearby residents due to bad odours and the presence of flies. Thus, they should be located sufficiently away from residential areas.

Operation & Maintenance Maintenance is an important aspect of well-functioning ponds, but it is not intensive. The discharging area must be maintained and kept clean to reduce the potential of disease transmission and nuisance (flies and odours). Solid waste that is discharged along with the sludge must be removed from the screen at the inlet of the ponds.

The thickened sludge must be mechanically removed (with a front end loader or other specialized equipment) after it has sufficiently thickened.

Pros & Cons

- + Thickened sludge is easier to handle and less prone to splashing and spraying
- + Can be built and repaired with locally available materials
- + Relatively low capital costs; low operating costs
- + No electrical energy is required
- Requires a large land area
- Odours and flies are normally noticeable
- Long storage times
- Requires front-end loader for desludging
- Requires expert design and construction
- Effluent and sludge require further treatment

References & Further Reading

- Heiness, U., Larmie, S. A. and Strauss, M. (1998). *Solids Separation and Pond Systems for the Treatment of Faecal Sludges in the Tropics – Lessons Learnt and Recommendations for Preliminary Design*. 2nd Ed. Report 05/98. Eawag (Department Sandec), Dübendorf, CH. Available at: www.sandec.ch
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- Montangero, A. and Strauss, M. (2002). *Faecal Sludge Treatment*. Lecture Notes, UNESCO-IHE, Delft, NL. Available at: www.sandec.ch
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