SLUDGE TREATMENT

Wolfram Sievert
Mizan Consult FZE

Reed Bed Technology

Constructed wetlands (Reed Beds) can be used for treatment of sewage, storm water, sewage sludge and pre-treatment of water works.

In the last decade the use of reed beds for the dewatering and mineralization of sewage sludge, spread worldwide and is nowadays a state of the art technology for handling sewage sludge.

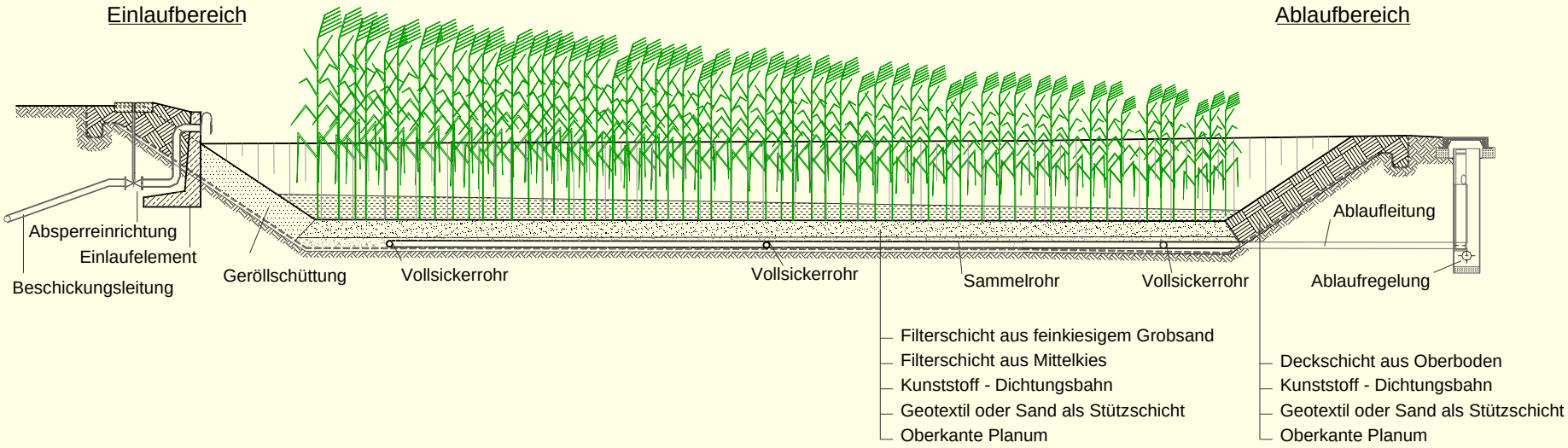
A few system already under operation in the Middle East have proven the high efficiency of this technology in warm arid regions.

Reed Bed Technology

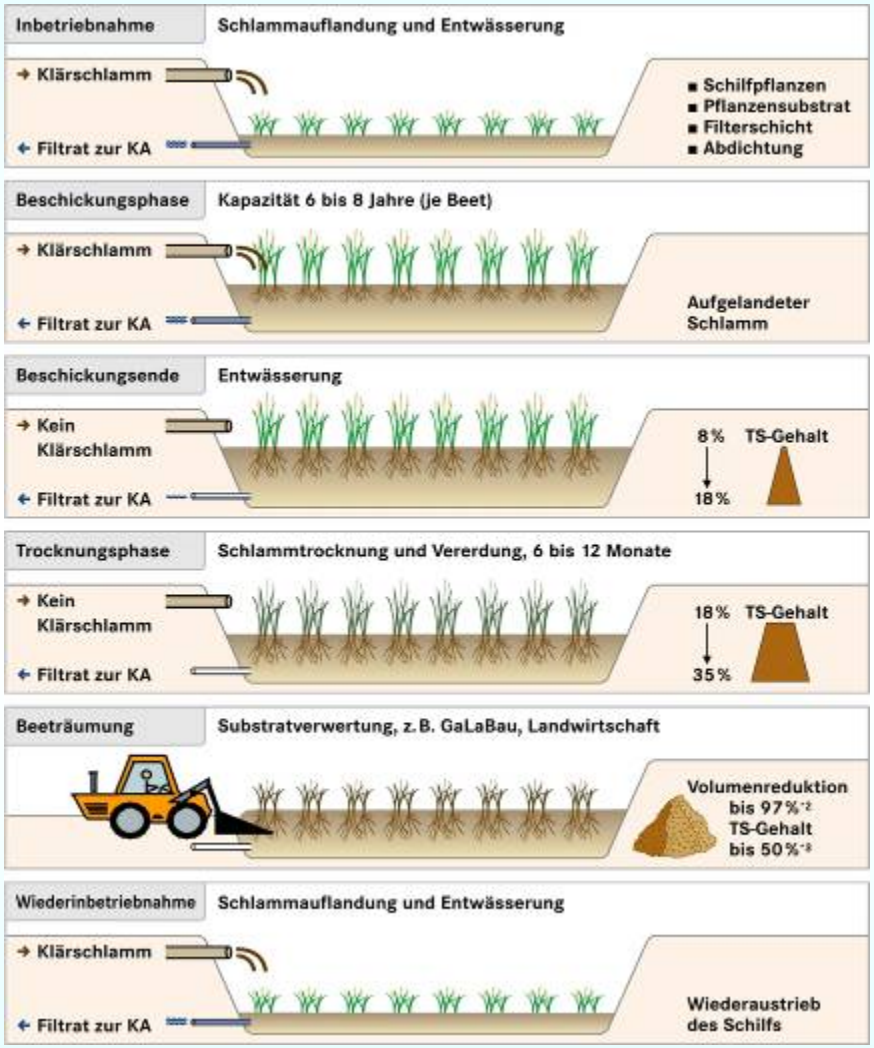
Domestic sludge is dispersed onto reed beds. The origin of the sludge can be septic tanks, anaerobic digester, aerobic waste water treatment plants with or without sludge stabilisation. There is no need of thickening of the sludge before it is dispersed onto the sludge dewatering reed beds. The main amount of water from the sludge is trickling vertically through the sand filter layer into a drainage system on the bottom of the sealed basins (polyethylene liner) by gravity, like in conventional sludge drying beds. The reed plants grow through the overlying sludge and develop numerous roots and shoots in the substrate. This leads to a forced dewatering and mineralization of the gravity dewatered sludge. The further dewatering is driven by evapotranspiration. The sludge volume declines to about 10 % of the initial volume. The gravity dewatering of new dispersed sludge through old below sludge layers is possible dew to the existence and continuous growth of rhizomes and stems which increase the permeability of the deeper sludge layers. The reed planted sludge dewatering reed beds work for a period of 4 to 12 years without sludge removal. During this period the sludge layer increase slowly to a thickness of up to 1.5m. The resulting product of the dewatering and mineralization is a earthy organic material.

Sewage Sludge Mineralization

Längsschnitt:



Sewage Sludge Mineralization, Process



Starting up ½ - 1 year

Loading 6 – 8 years

Drying ½ - 1 year

Interval of use ca. 7 – 10 years

Useful life > 25 years

→ **3 times sludge removal**

Grafikquelle: Ekoplant 2001

Sewage Sludge Mineralization, Product

- Watercontent 40 - 75%
- Carrier of nutrients with slowly nutrients delivery
- Stable structure and high waterstorage capacity (like humus)
- Use in
  - → Agriculture
  - → Landscaping
  - → Humusproduction

Sewage Sludge Mineralization, Advantages

- No sludge disposal
- No energy
- Low maintenance
- No spare parts
- Stock of humus / fertilizer
- High value of product

Sewage Sludge Mineralization, Examples

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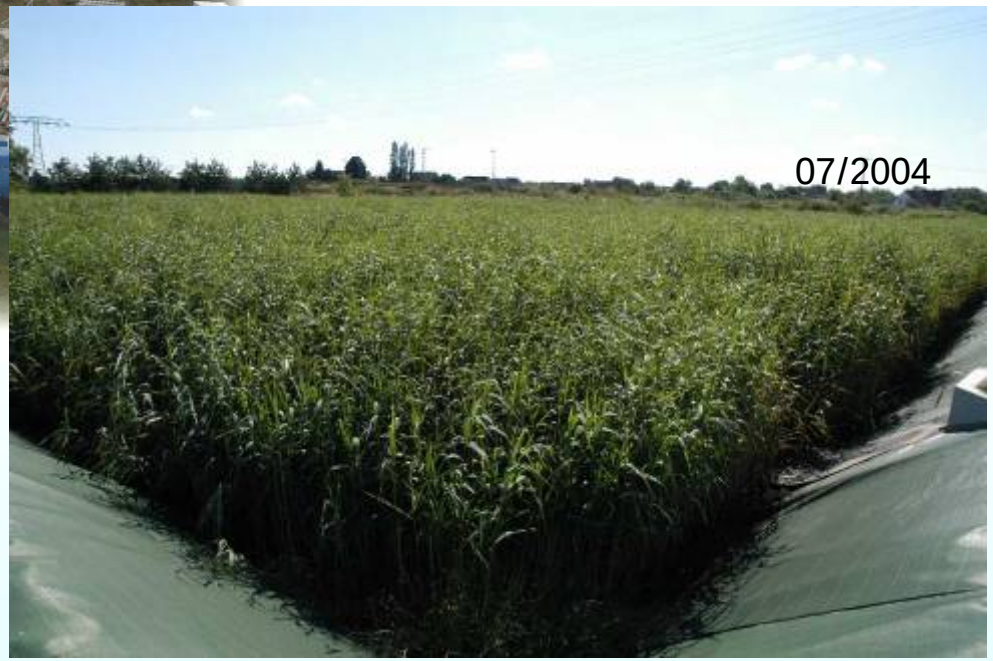
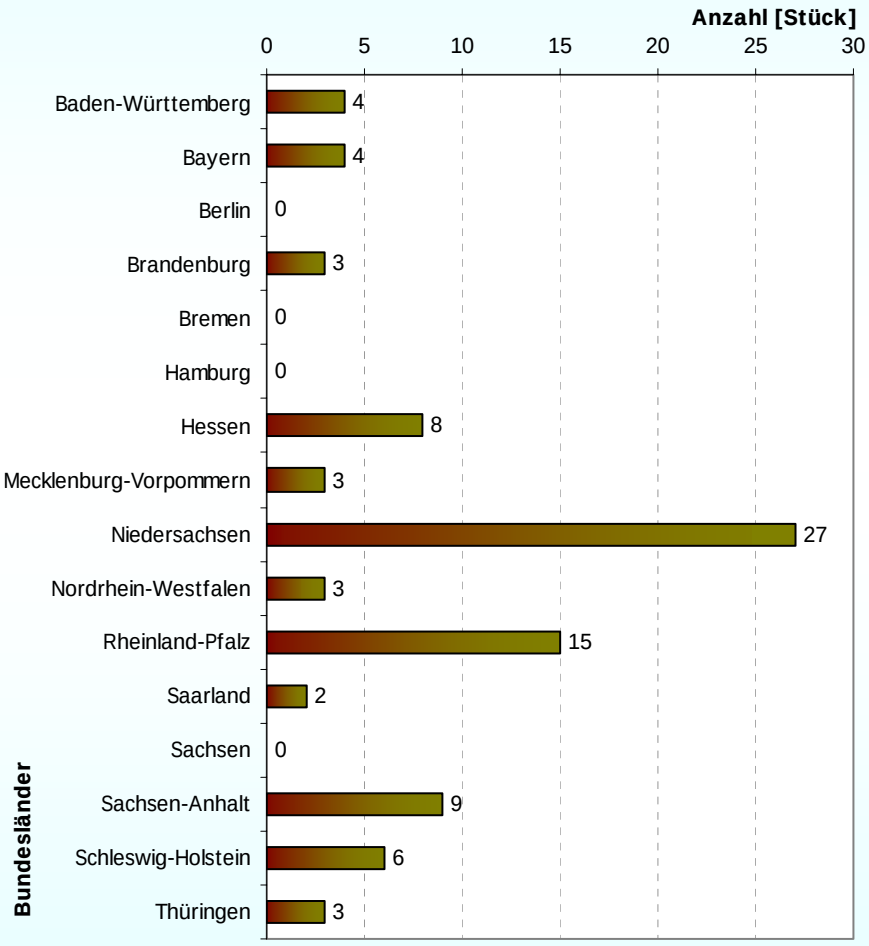


Sewage Sludge Mineralization, Examples



Six Senses Resort Zighy Bay, Oman

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