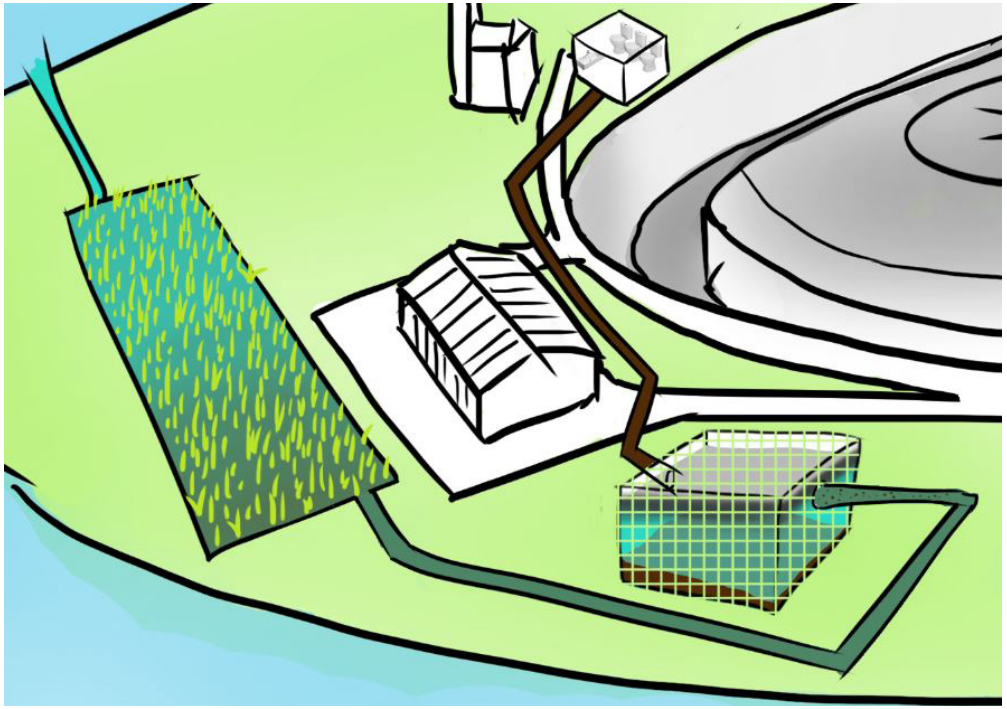
01. Septic tank + Horizontal Flow field

Description

A septic tank is a watertight chamber made of concrete. The black/ grey water flows into the chamber from one side, were settling and anaerobic processes reduce solids and organic waste. A second chamber is needed to prevent solids and scum from escaping the tank.

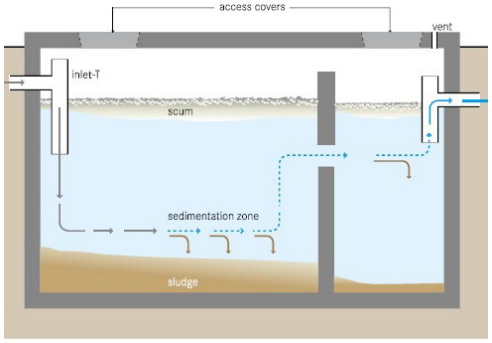
The horizontal flow field replicate the naturally occurring processes of a natural wetland. Water flows from one side of the field to the other side. Particles settle and pathogens are destroyed. The nutrients are neutralized by the plants and (micro)organisms.



Septic tank + Horizontal flow field

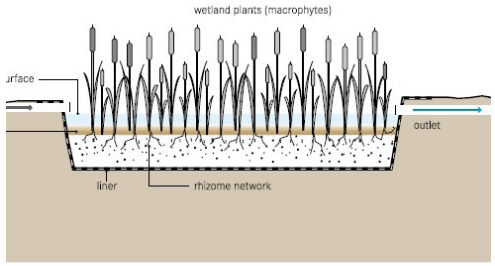
System information

Square meters:	879m2	Organic waste:	90%
Location:	Above- and underground	Phosfor:	43%
		Ammonia:	64%
costs:	Average		
Maintenance:	Average		



Cross section of a septictank

Underground septic tank



Cross section of a horizontal helofytenfilter

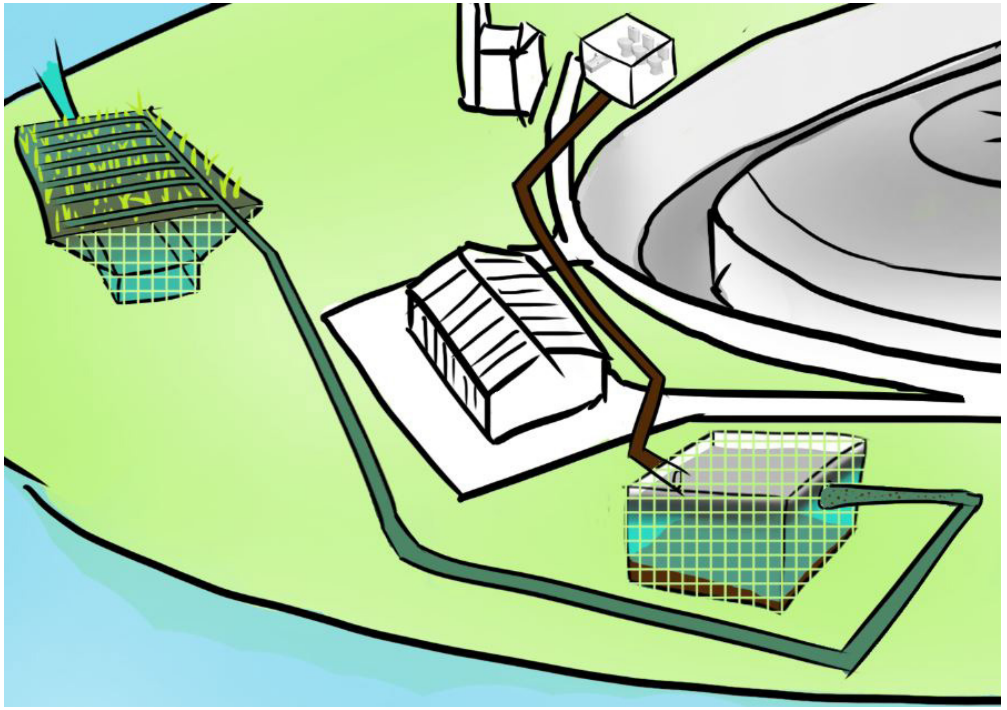
Helofytenfilter

02. Septic tank + Vertical flow field

Description

A septic tank is a watertight chamber made of concrete. The black/ grey water flows into the chamber from one side, were settling and anaerobic processes reduce solids and organic waste. A second chamber is needed to prevent solids and scum from escaping the tank.

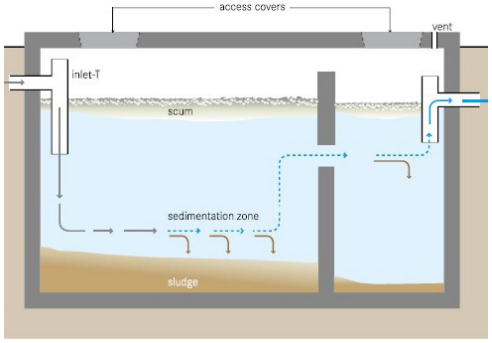
The vertical flow field replicate the naturally occurring processes of a natural wetland. Wastewater infiltrates into the field and will be drained from the bottom. Particles settle and pathogens are destroyed. The aerobic conditions in a vertical flow field are better compared to a horizontal field, because it can clean more water on a smaller surface.



Septic tank + Horizontal flow field

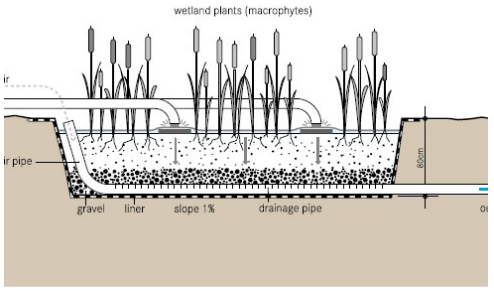
System information

Square meters:	187m2	Organic waste:	94%
Location:	Above and under ground	Phosfor:	90%
		Ammonia:	83%
costs:	Average		
Maintenance:	Average		



Cross section of a septictank

Underground septic tank



Cross section of a vertical helofy-tenfilter

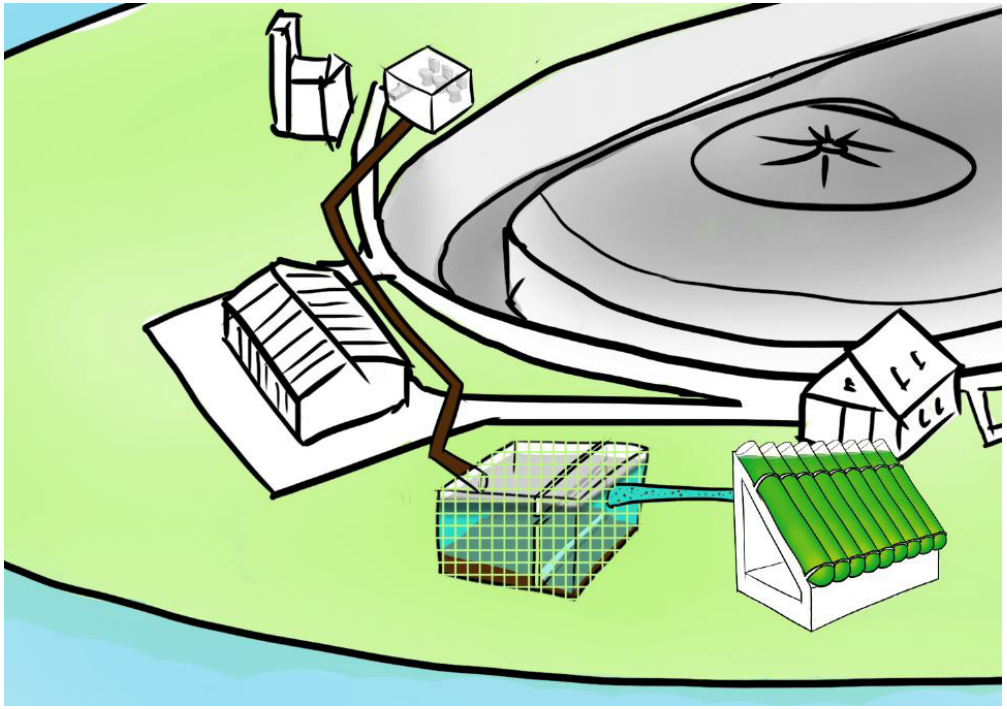
Helofytenfilter

03. Septic tank + Algae

Description

A septic tank is a watertight chamber made of concrete. The black/ grey water flows into the chamber from one side, were settling and anaerobic processes reduce solids and organic waste. A second chamber is needed to prevent solids and scum from escaping the tank.

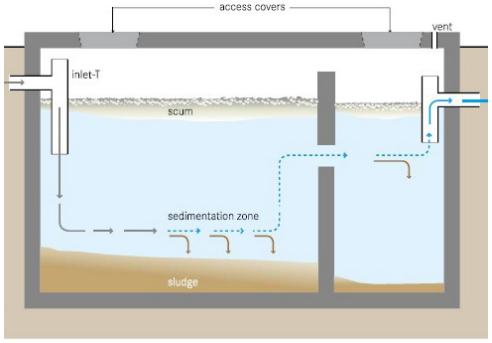
The algae are microorganism that can grow rapidly. For wastewater treatment they are used to filter phosphate and nitrogen. The system uses less energy than conventional system due the in situ oxygen production and a shorter retention time, which consumes less space.



Septic tank + Algae

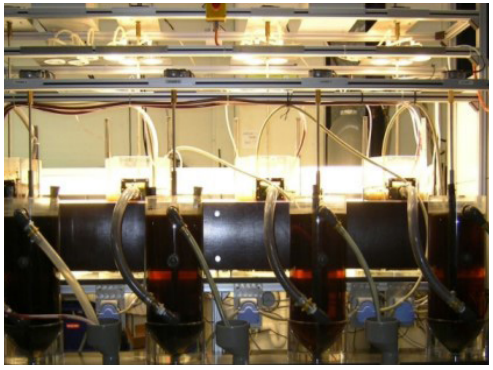
System information

Square meters:	29m2	Organic waste:	94%
Location:	Above and under ground	Phosfor:	75%
		Ammonia:	93%
costs:	high		
Maintenance:	Average		



Cross section of a septictank

Underground septic tank



Algae system

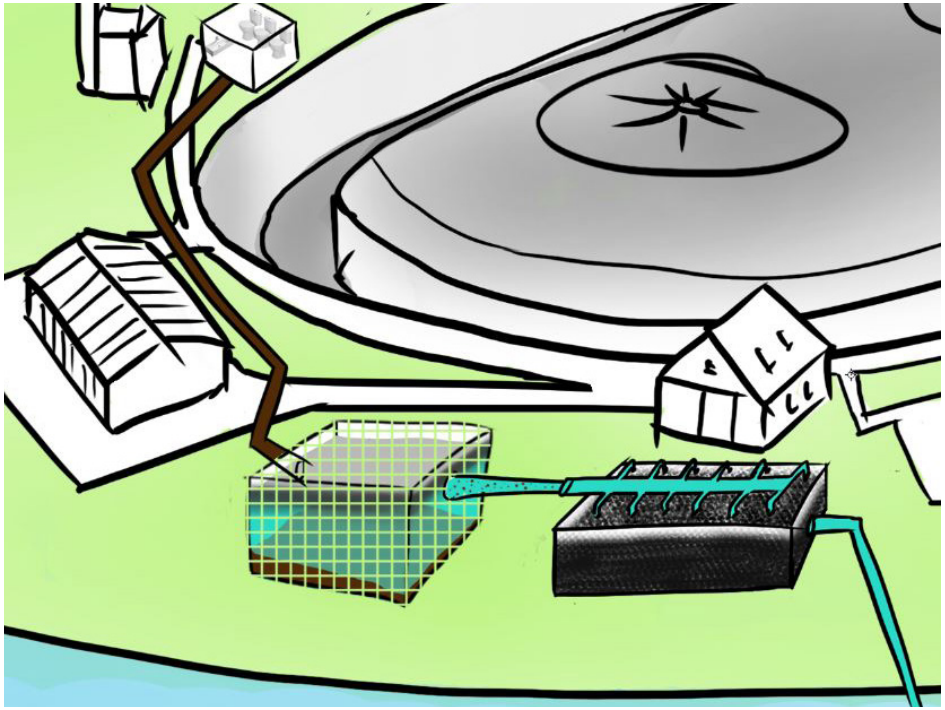
Visualisation of the tubes with algae

04. Septic tank + Trickling filter

Description

A septic tank is a watertight chamber made of concrete. The black/ grey water flows into the chamber from one side, were settling and anaerobic processes reduce solids and organic waste. A second chamber is needed to prevent solids and scum from escaping the tank.

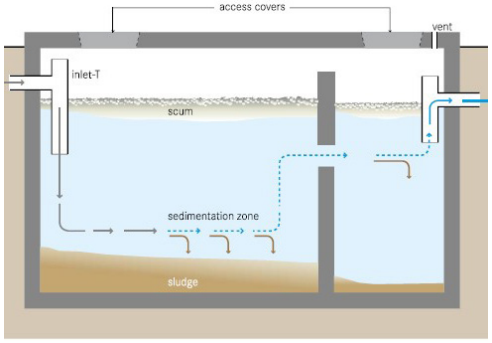
A trickling filter is a fixed bed, biological reactor that can operate under most aerobic conditions. Waste water is continuously sprayed over the top layer where water infiltrates through the soil. The biofilm (microorganism) around the filter material degrades the organic waste.



Septic tank + Trickling filter

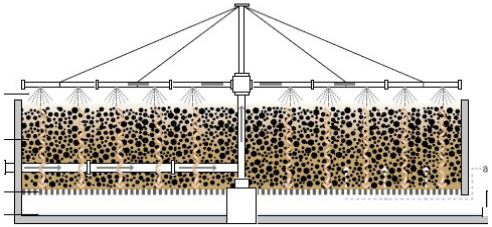
System information

Square meters:	29m2	Organic waste:	81%
Location:	Above and under ground	Phosfor:	25%
		Ammonia:	78%
costs:	low		
Maintenance:	Average		



Cross section of a septictank

Underground septic tank



Cross section of a trickling filter

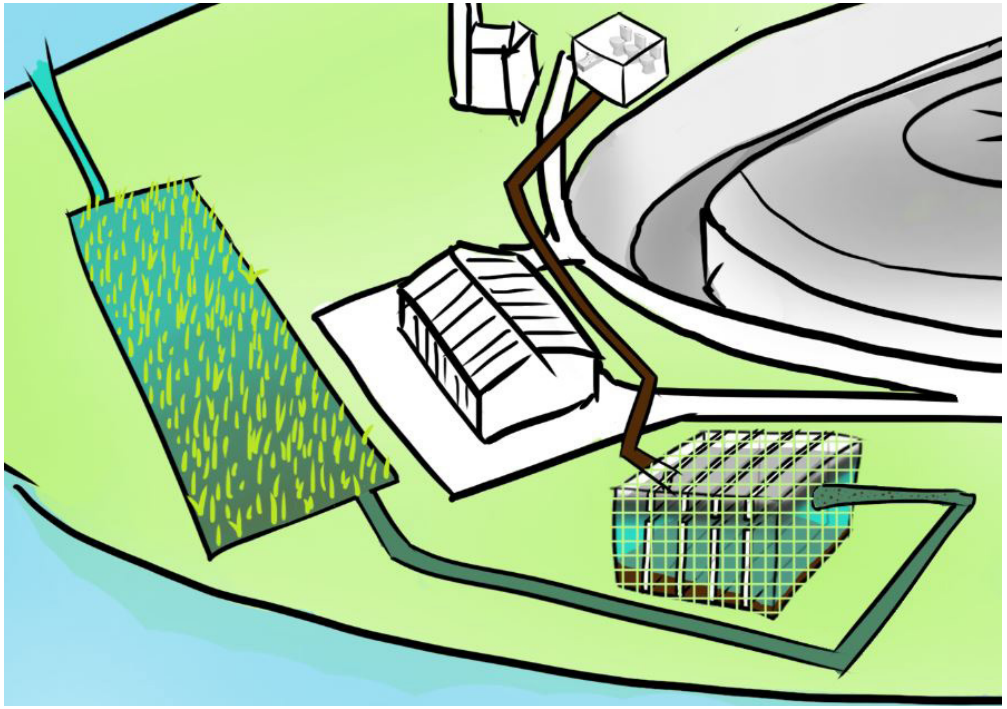
Realisation of a trickling filter

05. ABR + Horizontal Flow field

Description

Anaerobic baffled reactor (ABR) is an improved septic tank with multiple chambers. The water is forced to flow through the sludge from bottom to top through many chambers. The increased contact time with the active sludge results in an improved wastewater treatment.

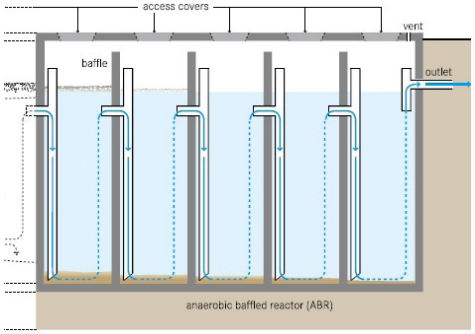
The horizontal flow field replicate the naturally occurring processes of a natural wetland. Water flows from one side of the field to the other side. Particles settle and pathogens are destroyed. The nutrients are neutralized by the plants and (micro)organisms.



ABR + Horizontal flow field

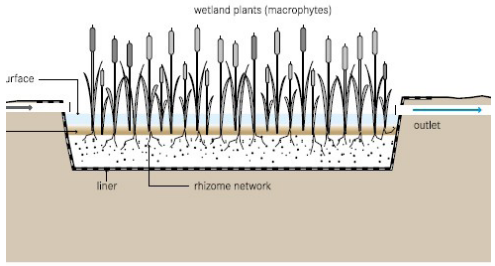
System information

Square meters:	880m2	Organic waste:	97%
Location:	Above and under ground	Phosfor:	49%
		Ammonia:	64%
costs:	high		
Maintenance:	High		



Cross section of a Anaerobic baffled reactor

Anaerobic baffled reactor



Cross section of a horizontal helofytenfilter

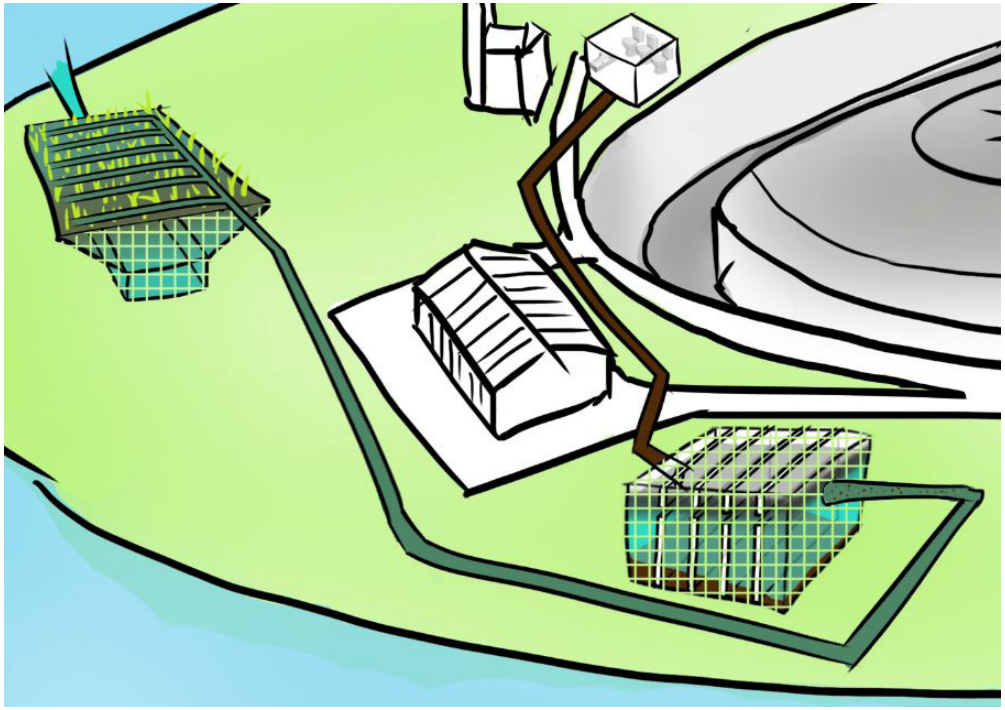
Helofytenfilter

06. ABR + Vertical flow field

Description

Anaerobic baffled reactor (ABR) is an improved septic tank with multiple chambers. The water is forced to flow through the sludge from bottom to top through many chambers. The increased contact time with the active sludge results in an improved wastewater treatment.

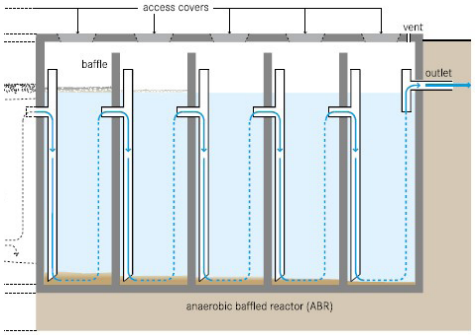
The vertical flow field replicate the naturally occurring processes of a natural wetland. Wastewater infiltrates into the field and will be drained from the bottom. Particles settle and pathogens are destroyed. The aerobic conditions in a vertical flow field are better compared to a horizontal field, because it can clean more water on a smaller surface.



Septic tank + Vertical flow field

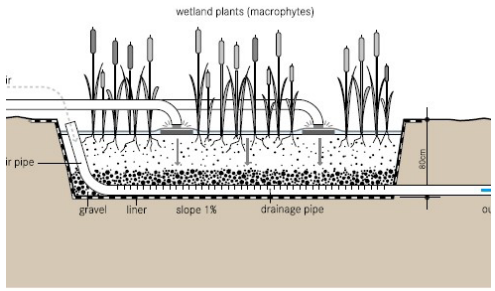
System information

Square meters:	188m2	Organic waste:	98%
Location:	Above and under ground	Phosfor:	91%
		Ammonia:	83%
costs:	High		
Maintenance:	High		



Cross section of a Anaerobic baffled reactor

Anaerobic baffled reactor



Cross section of a vertical helofytenfilter

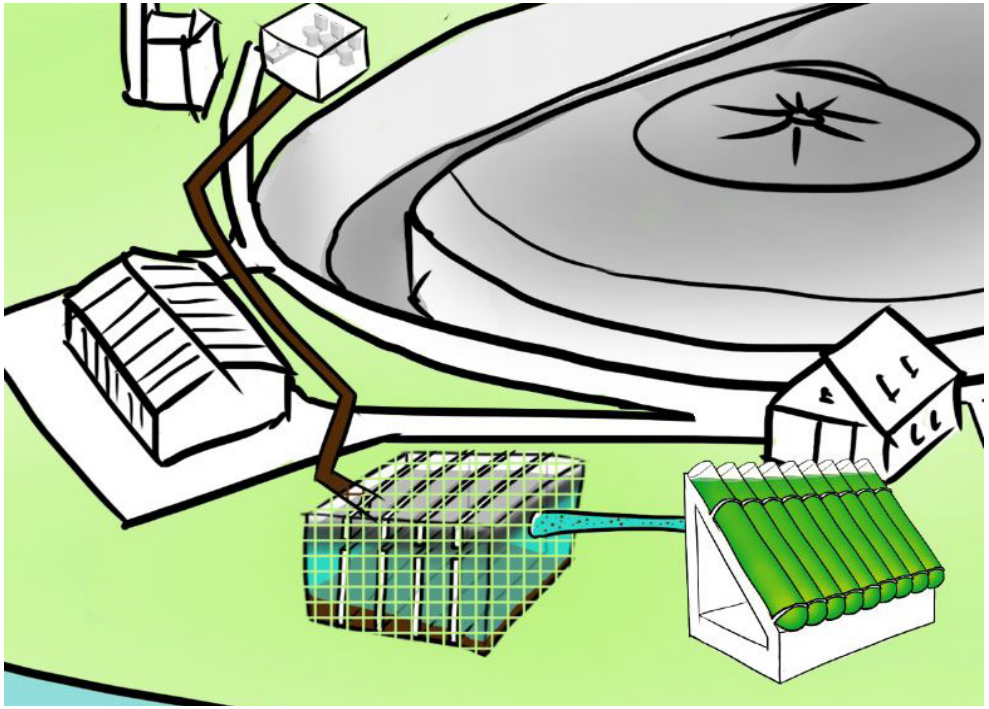
Helofytenfilter

07. ABR + Algae

Description

Anaerobic baffled reactor (ABR) is an improved septic tank with multiple chambers. The water is forced to flow through the sludge from bottom to top through many chambers. The increased contact time with the active sludge results in an improved wastewater treatment.

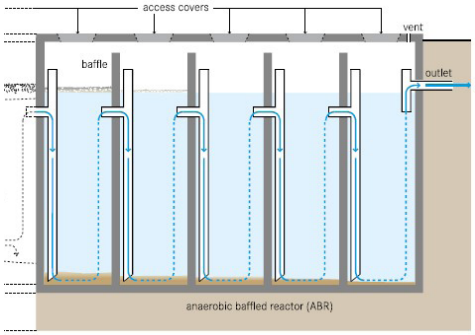
The algae are microorganism that can grow rapidly. For wastewater treatment they are used to filter phosphate and nitrogen. The system uses less energy than conventional system due the in situ oxygen production and a shorter retention time, which consumes less space.



ABR + Algae

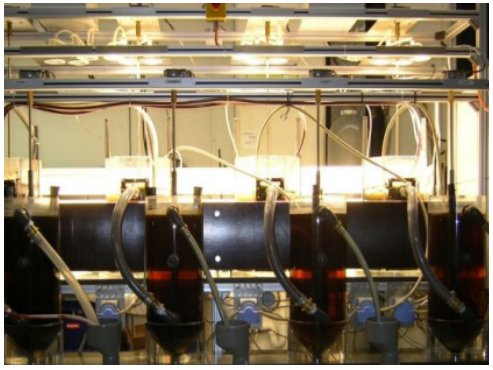
System information

Square meters:	30m2	Organic waste:	98%
Location:	Above and under ground	Phosfor:	78%
		Ammonia:	92%
costs:	High		
Maintenance:	Average		



Cross section of a Anaerobic baffled reactor

Anaerobic baffled reactor



Algae system

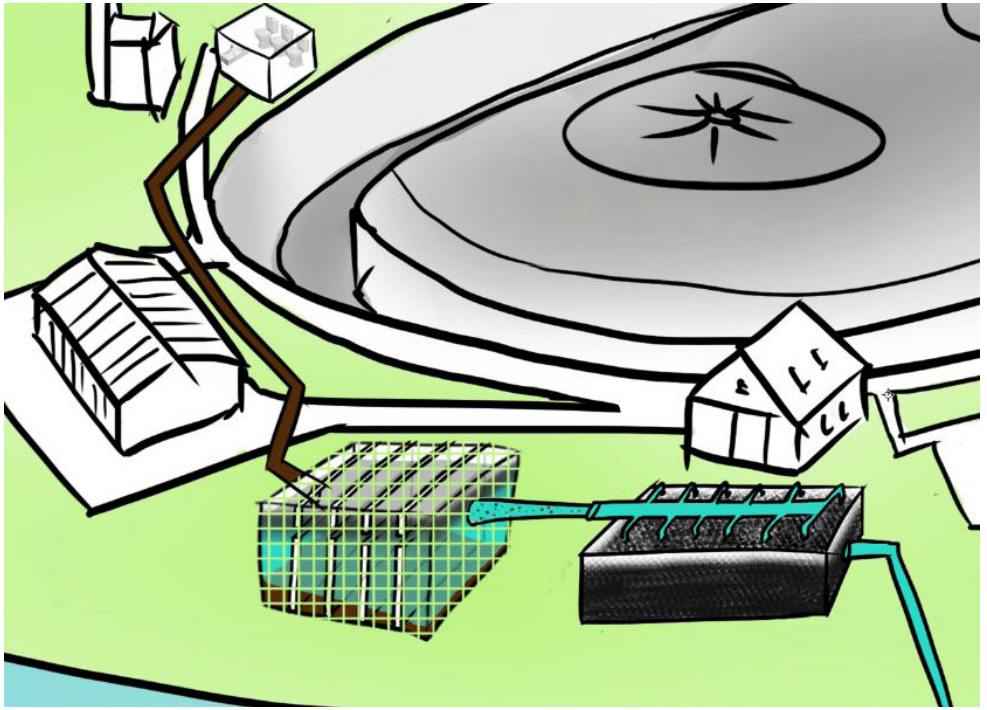
Visualisation of the tubes with algae

08. ABR + Trickling filter

Description

Anaerobic baffled reactor (ABR) is an improved septic tank with multiple chambers. The water is forced to flow through the sludge from bottom to top through many chambers. The increased contact time with the active sludge results in an improved wastewater treatment.

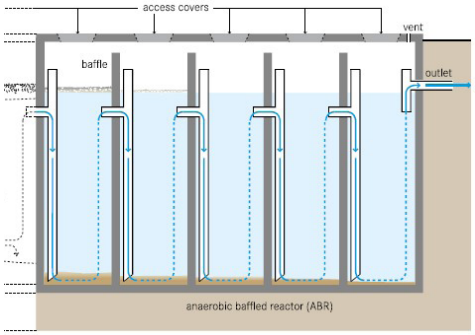
A trickling filter is a fixed bed, biological reactor that can operate under most aerobic conditions. Waste water is continuously sprayed over the top layer where water infiltrates through the soil. The biofilm (microorganism) around the filter material degrades the organic waste.



ABR+ Trickling filter

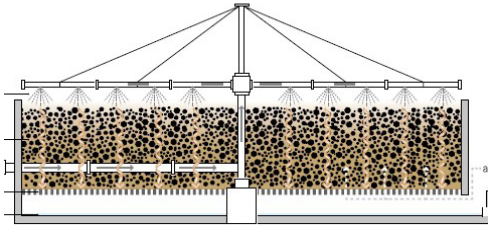
System information

Square meters:	30m2	Organic waste:	95%
Location:	Above and under ground	Phosfor:	34%
		Ammonia:	77%
costs:	Very high		
Maintenance:	High		



Cross section of a Anaerobic baffled reactor

Anaerobic baffled reactor



Cross section of a trickling filter

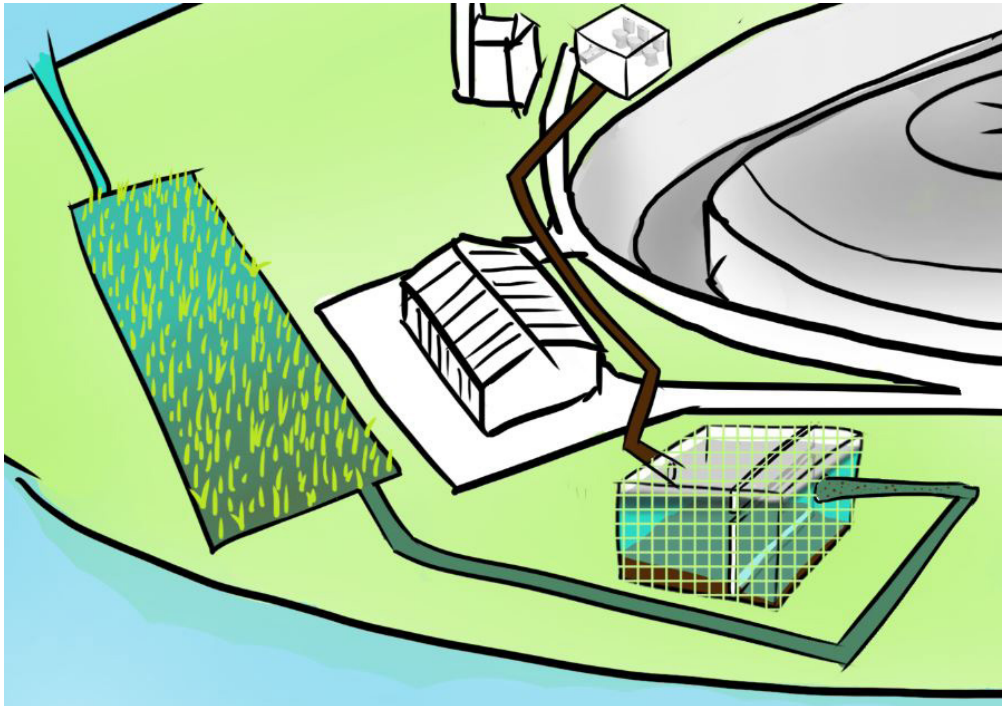
Realisation of a trickling filter

09. Settler + Horizontal Flow field

Description

A settler is designed to remove suspended solids by sedimentation. The low flow of the waste water makes sinking of solids possible. Organic waste is barely removed by the settler tank due the short retention time.

The horizontal flow field replicate the naturally occurring processes of a natural wetland. Water flows from one side of the field to the other side. Particles settle and pathogens are destroyed. The nutrients are neutralized by the plants and (micro)organisms.

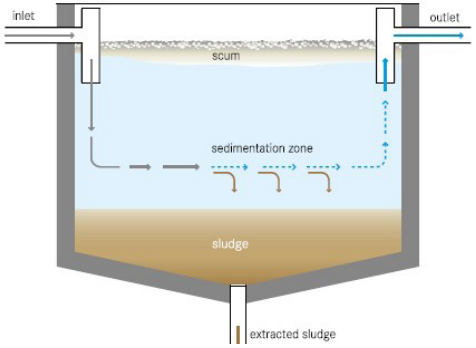


Settler + Horizontal flow field

System information

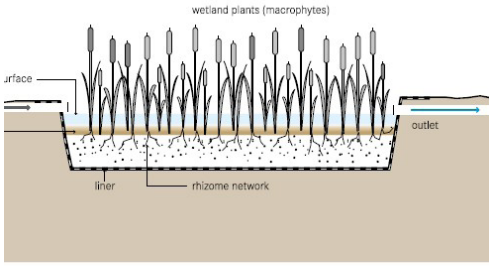
Square meters:	872m2
Location:	Above and under ground
costs:	Average
Maintenance:	Average

Organic waste:	90%
Phosfor:	43%
Ammonia:	53%



Cross section of a settler tank

Settler tank under construction



Cross section of a horizontal helofytenfilter

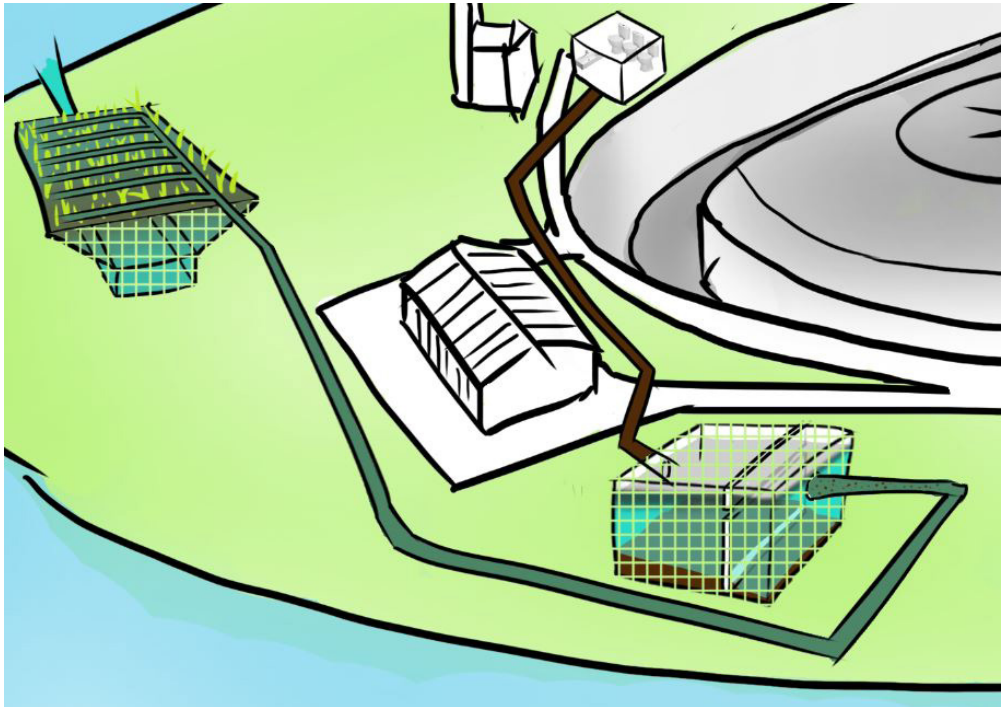
Helofytenfilter

10. Settler + Vertical flow field

Description

A settler is designed to remove suspended solids by sedimentation. The low flow of the waste water makes sinking of solids possible. Organic waste is barely removed by the settler tank due the short retention time.

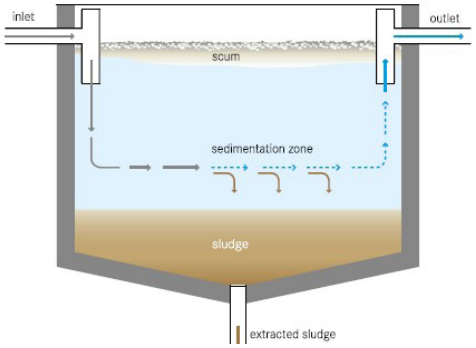
The vertical flow field replicate the naturally occurring processes of a natural wetland. Wastewater infiltrates into the field and will be drained from the bottom. Particles settle and pathogens are destroyed. The aerobic conditions in a vertical flow field are better compared to a horizontal field, because it can clean more water on a smaller surface.



Settler + Vertical flow field

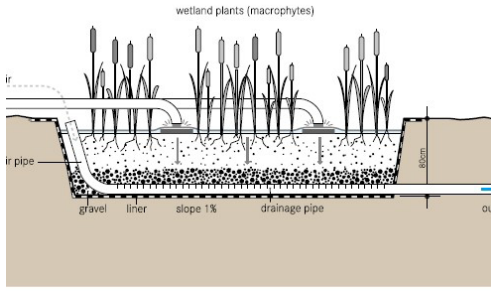
System information

Square meters:	180m2	Organic waste:	93%
Location:	Above and under ground	Phosfor:	90%
		Ammonia:	77%
costs:	Average		
Maintenance:	Average		



Cross section of a settler tank

Settler tank under construction



Cross section of a vertical helofytenfilter

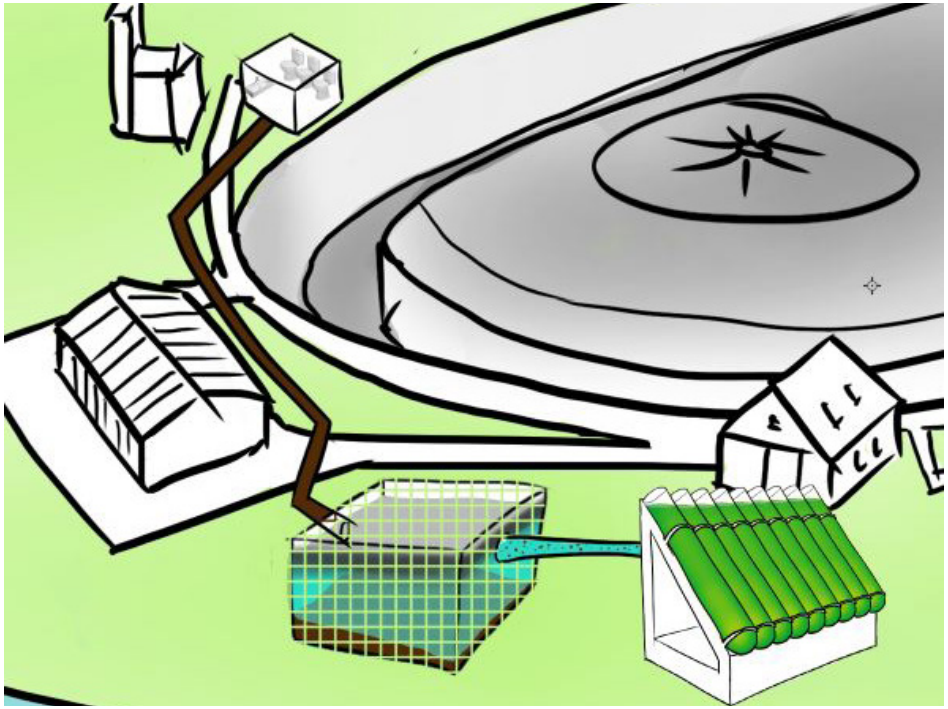
Helofytenfilter

11. Settler + Algae

Description

A settler is designed to remove suspended solids by sedimentation. The low flow of the waste water makes sinking of solids possible. Organic waste is barely removed by the settler tank due the short retention time.

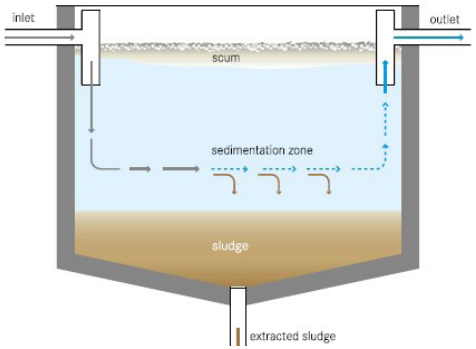
The algae are microorganism that can grow rapidly. For wastewater treatment they are used to filter phosphate and nitrogen. The system uses less energy than conventional system due the in situ oxygen production and a shorter retention time, which consumes less space.



Settler + Algae

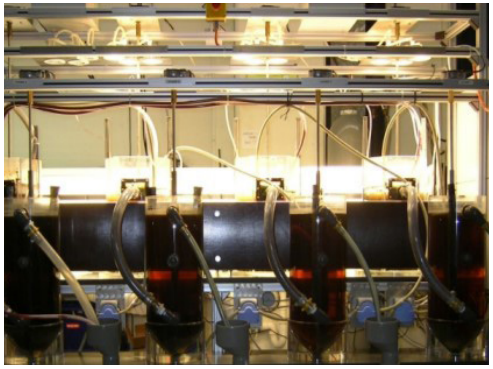
System information

Square meters:	22m2	Organic waste:	93%
Location:	Above and under ground	Phosfor:	75%
		Ammonia:	90%
costs:	Average		
Maintenance:	Average		



Cross section of a settler tank

Settler tank under construction



Algae system

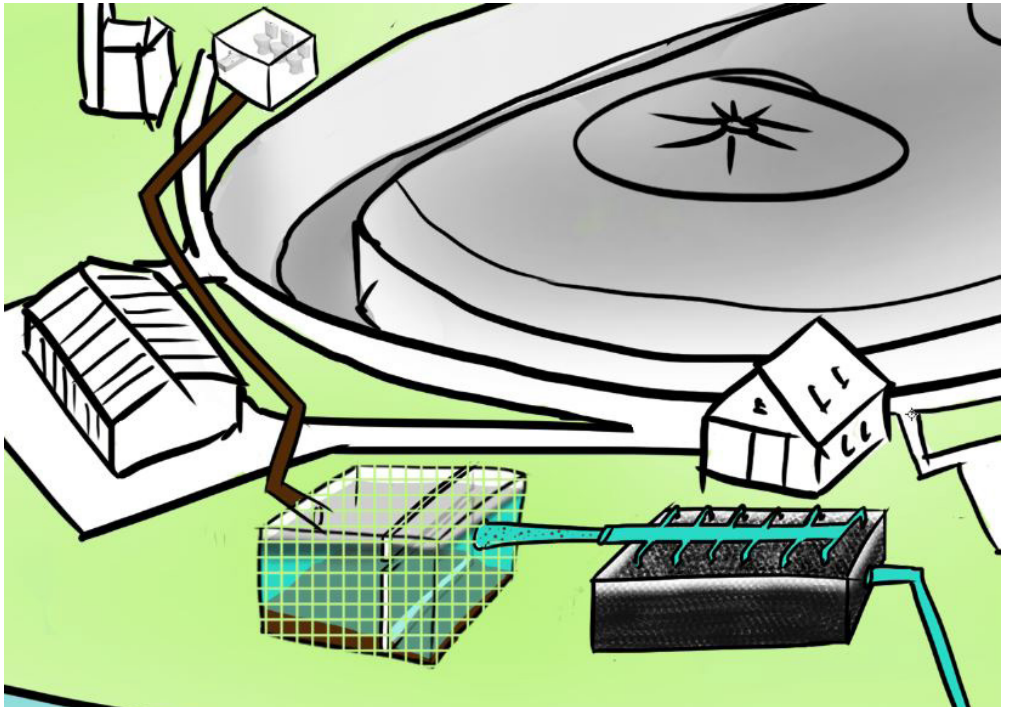
Visualisation of the tubes with algae

12. Settler + Trickling filter

Description

A settler is designed to remove suspended solids by sedimentation. The low flow of the waste water makes sinking of solids possible. Organic waste is barely removed by the settler tank due the short retention time.

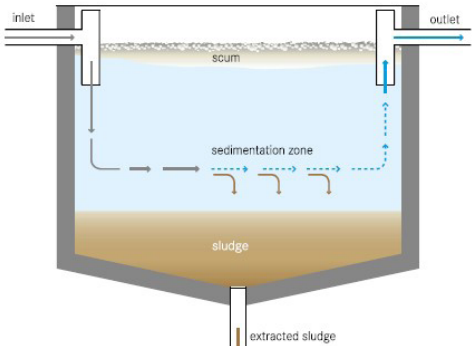
A trickling filter is a fixed bed, biological reactor that can operate under most aerobic conditions. Waste water is continuously sprayed over the top layer where water infiltrates through the soil. The biofilm (microorganism) around the filter material degrades the organic waste.



Settler + Trickling filter

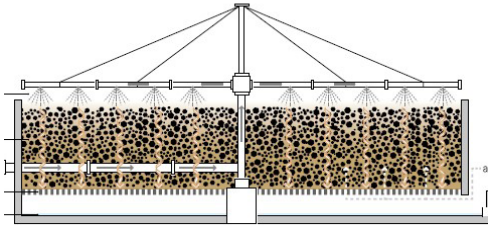
System information

Square meters:	22m2	Organic waste:	79%
Location:	Above and under ground	Phosfor:	25%
		Ammonia:	70%
costs:	High		
Maintenance:	High		



Cross section of a settler tank

Settler tank under construction



Cross section of a trickling filter

Realisation of a trickling filter

13. Imhoff tank + Horizontal Flow field

Description

The Imhoff tank is designed for solid-liquid separation and digesti-on of the settled sludge. It consist of a v-shaped settling compart-ment above a tapering sludge digestion chamber with gas vents. The shape ensures that foul gas does not disrupt the settling process. The organic waste is treated within the sludge and gives average results.

The horizontal flow field replicate the naturally occurring proces-ses of a natural wetland. Water flows from one side of the field to the other side. Particles settle and pathogens are destroyed. The nutrients are neutralized by the plants and (micro)organisms.

Advantages

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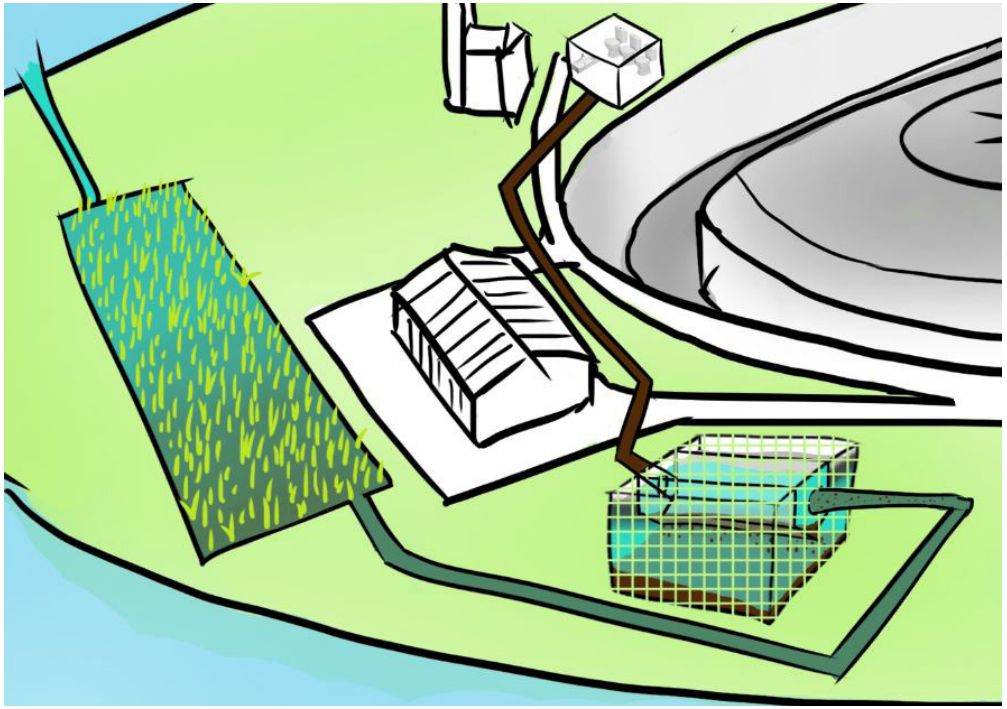
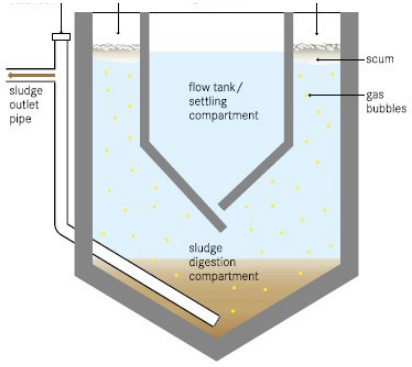


Imhoff tank + Horizontal flow field

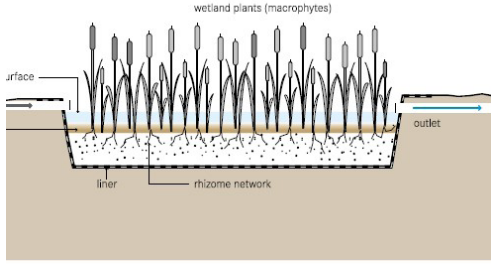
System information

Square meters:	885m2	Organic waste:	91%
Location:	Above and under ground	Phosfor:	51%
		Ammonia:	57%
costs:	Average		
Maintenance:	Average		



Cross section of a imhoff tank

Imhoff tank without grating



Cross section of a horizontal helofytenfilter

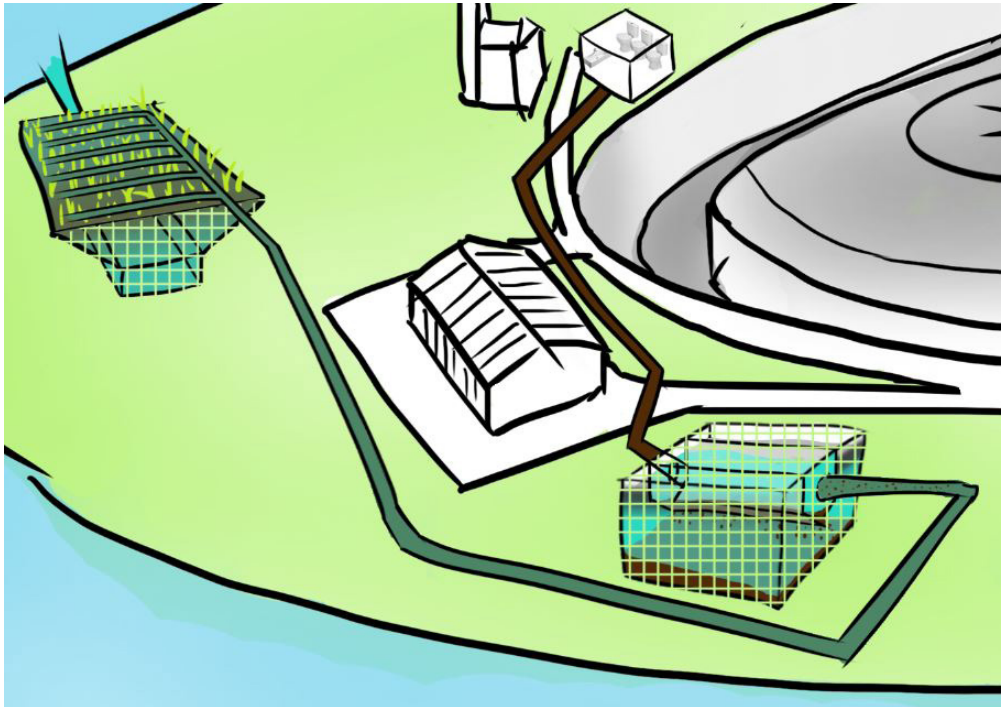
Helofytenfilter

14. Imhoff tank + Vertical flow field

Description

The Imhoff tank is designed for solid-liquid separation and digestion of the settled sludge. It consist of a v-shaped settling compartment above a tapering sludge digestion chamber with gas vents. The shape ensures that foul gas does not disrupt the settling process. The organic waste is treated within the sludge and gives average results.

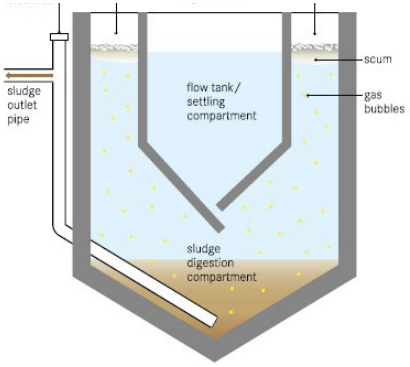
The vertical flow field replicate the naturally occurring processes of a natural wetland. Wastewater infiltrates into the field and will be drained from the bottom. Particles settle and pathogens are destroyed. The aerobic conditions in a vertical flow field are better compared to a horizontal field, because it can clean more water on a smaller surface.



Imhoff tank + Vertical flow field

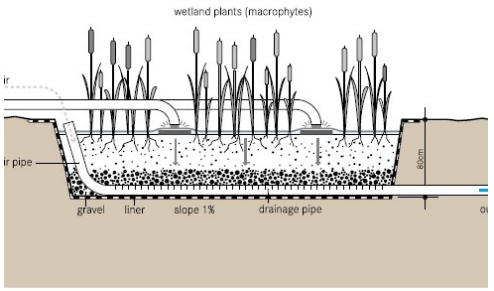
System information

Square meters:	193m2	Organic waste:	94%
Location:	Above and under ground	Phosfor:	92%
		Ammonia:	79%
costs:	Average		
Maintenance:	Average		



Cross section of a imhoff tank

Imhoff tank without grating



Cross section of a vertical helofytenfilter

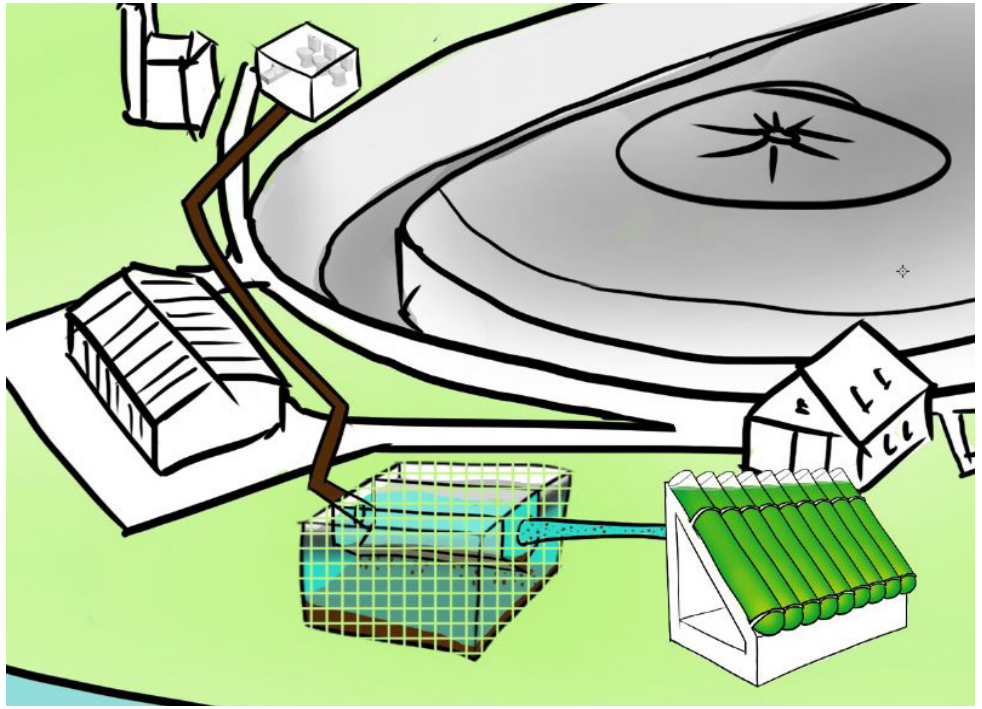
Helofytenfilter

15. Imhoff tank + Algae

Description

The Imhoff tank is designed for solid-liquid separation and digestion of the settled sludge. It consist of a v-shaped settling compartment above a tapering sludge digestion chamber with gas vents. The shape ensures that foul gas does not disrupt the settling process. The organic waste is treated within the sludge and gives average results.

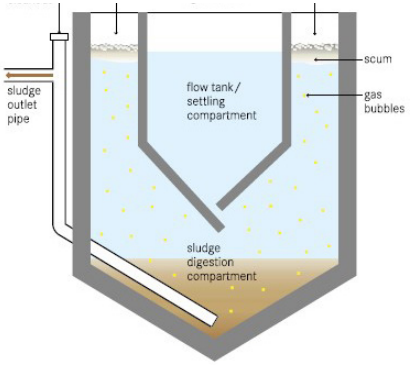
The algae are microorganism that can grow rapidly. For wastewater treatment they are used to filter phosphate and nitrogen. The system uses less energy than conventional system due the in situ oxygen production and a shorter retention time, which consumes less space.



Imhoff tank + Algae

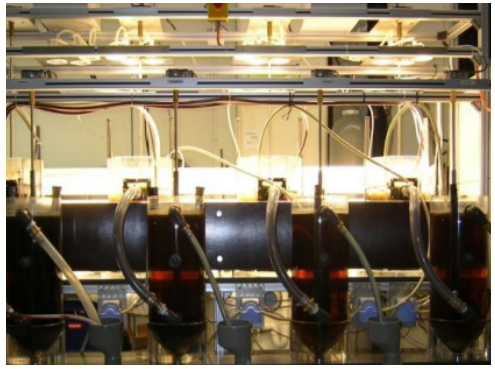
System information

Square meters:	35m2	Organic waste:	94%
Location:	Above and under ground	Phosfor:	71%
		Ammonia:	91%
costs:	Average		
Maintenance:	Average		



Cross section of a imhoff tank

Imhoff tank without grating



Algae system

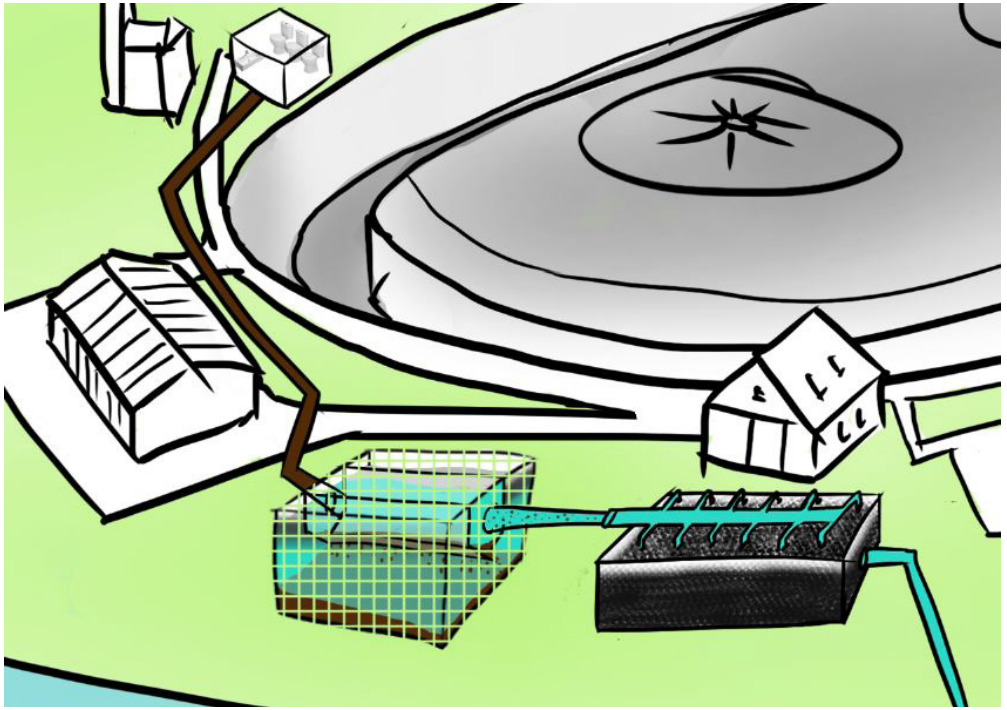
Visualisation of the tubes with algae

16. Imhoff tank + Trickling filter

Description

The Imhoff tank is designed for solid-liquid separation and digesti-on of the settled sludge. It consist of a v-shaped settling compart-ment above a tapering sludge digestion chamber with gas vents. The shape ensures that foul gas does not disrupt the settling process. The organic waste is treated within the sludge and gives average results.

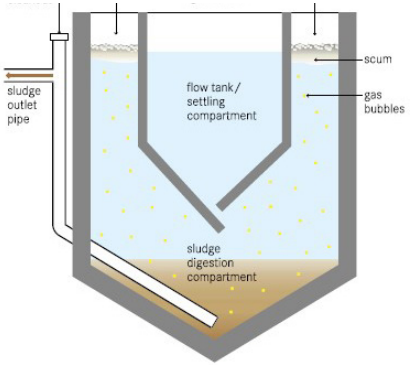
A trickling filter is a fixed bed, biological reactor that can opera-te under most aerobic conditions. Waste water is continuously sprayed over the top layer where water infiltrates through the soil. The biofilm (microorganism) around the filter material degrades the organic waste.



Imhoff tank + Trickling filter

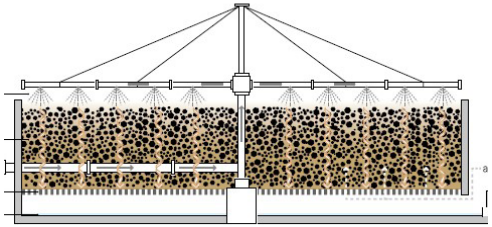
System information

Square meters:	35m2	Organic waste:	81%
Location:	Above and under ground	Phosfor:	36%
		Ammonia:	73%
costs:	High		
Maintenance:	High		



Cross section of a imhoff tank

Imhoff tank without grating



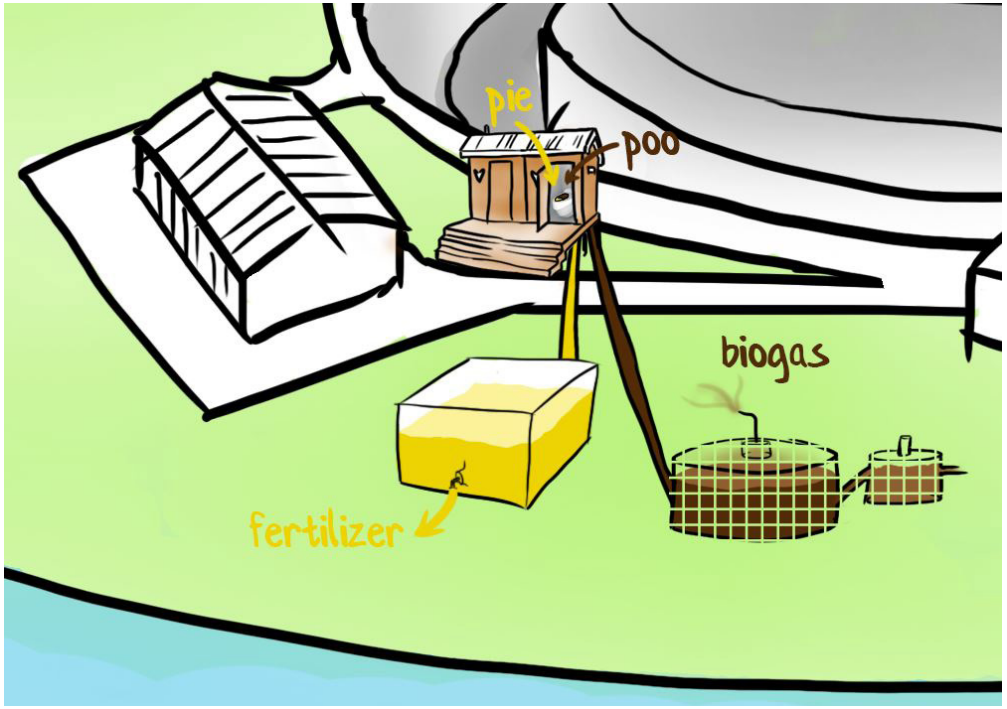
Cross section of a trickling filter

Realisation of a trickling filter

17. Dehydration vaults

Description

Dehydration vaults are used to collect and store dry faeces and urine separately. The vaults are water tight and need ventilation. When faeces are not mixed with liquids they quickly dry. By the absence of moisture, organisms cannot grow, pathogens are destroyed and smell is minimized. Urine can be used as fertilizer were dry faeces alter into compost.

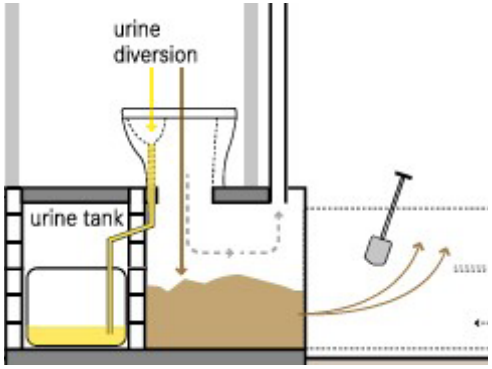


Dehydration vaults

System information

Square meters:	?? m2
Location:	Above ground
costs:	high
Maintenance:	high

Organic waste:	100%
Phosfor:	100%
Ammonia:	100%



Cross section of a dehydration vault

The simplicity of a dehydration vault

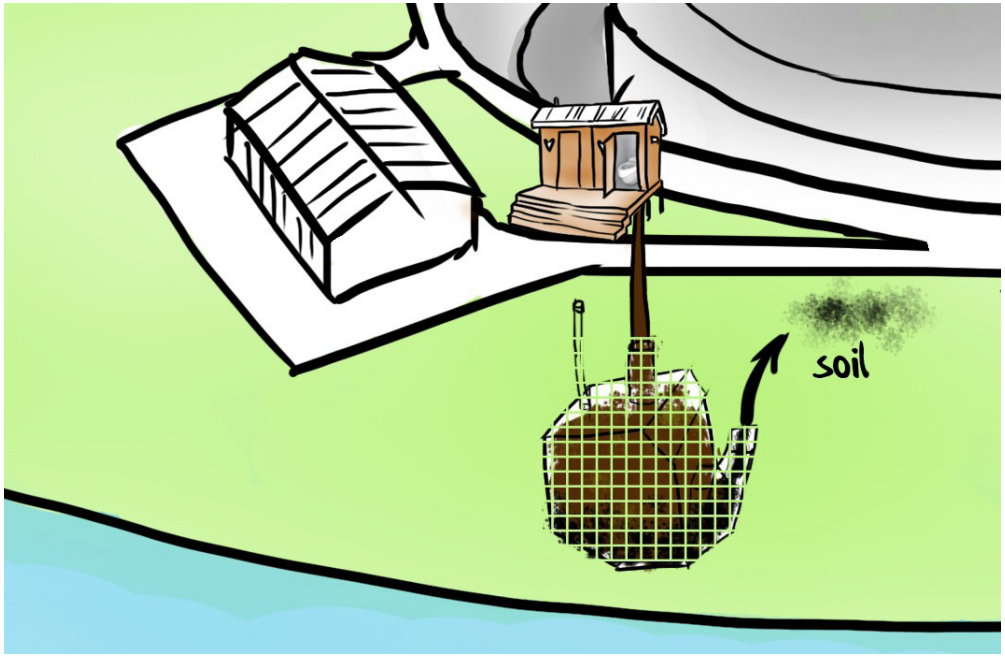
Seperation toilet

System that creates fertelizer from urine

18. Compost toilets

Description

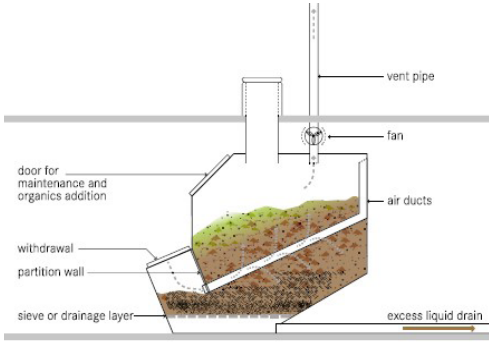
Composting refers to the process in which biodegradable components are biologically decomposed by microorganisms under aerobic conditions. A chamber is designed to convert excreta and organics into compost. The compost is a stable inoffensive product that can be safely handled and used as a soil conditioner. The compost is easily accessible.



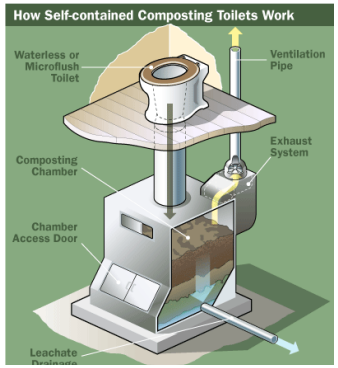
Compost toilet

System information

Square meters:	153m2	Organic waste:	100%
Location:	Above and under ground	Phosfor:	100%
		Ammonia:	100%
costs:	low		
Maintenance:	high		



Cross section of a compost chamber



Modern composting toilet

Simplicty of a toilet seat mostly used