

Constructed Wetland Vidrare



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Summary

- ✖ **Situation in Vidrare**
- ✖ **Realisation of a wastewater treatment for the Centre of Handicapped People**
- ✖ **Photo's of the construction**

Introduction OtterWasser GmbH

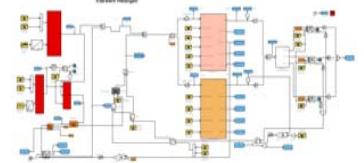
✗ **Urban drainage and wastewater**

- ✗ for rural areas (constructed wetlands, pond systems etc.)
- ✗ for urban areas (activated sludge systems)



✗ **Simulation of wastewater treatment plants**

- ✗ optimisation of the operation



✗ **Integrated technologies**

- ✗ source separating systems



✗ **Projects outside the european community**

- ✗ adapted technologies to local conditions
- ✗ dry toilet systems



Wastewater Treatment, Vidrare

✗ Situation in Vidrare

- ✗ gutter and creek with waste and wastewater
- ✗ problem with odour/smelling
- ✗ pilot project together with the municipality of Pravets/WECF/EcoWorld/Handicaped centre/ state administration Sofia Oblast
- ✗ Foundation of DBU

Decision prozess

✗ Basic conditions:

- ✗ Existing sewerage on the ground: The pipes from the main building and the laundry leaves the buildings in direction of the street
- ✗ Slope of the yard
- ✗ Available space: parts of the yard of the Home
- ✗ existing sewerage, gully and river as receiving water

Decision prozess



Decision prozess

- ✖ **More basic conditions:**

- ✖ People living in the Home: maximum 95 beds
- ✖ Measurement of the needed drinking water was made before the design: measured volume 8,5 m³/d (while measurement, several beds are not occupied)
- ✖ People working in the Home: 2 shafts with 25 employees
- ✖ Estimated volume of wastewater: 11 m³/d (all beds are occupied)

Decision process, conclusion

- ✗ About 400 m² are available in the yard
- ✗ Treatment plant is needed with easy operation and maintenance
- ✗ low energy consumption is wanted
- ✗ no danger for the inhabitants of the home

- ✗ Advantages of constructed wetlands

	constructed wetland
Energy demand	low
operation/maintenance	low
needed area	large
costs	low
sludge management	primary sludge has to be disposed

Decision process, timescale

✗ **Agenda of the project**

- ✗ looking for the surrounding of the handicaped centre and first idea, which treatment will be the best (March 2009)
- ✗ detailed planning and first drawing (summer/autum 2009)
- ✗ Meetings with the municipality, explanations of the technics
- ✗ technical describtion for the allowance of the discharge of the water administration (spring 2010)
- ✗ Competition for choosing the constructing company (Summer 2010)
- ✗ Start of construction in Nov 2010
- ✗ Finished in April 2011

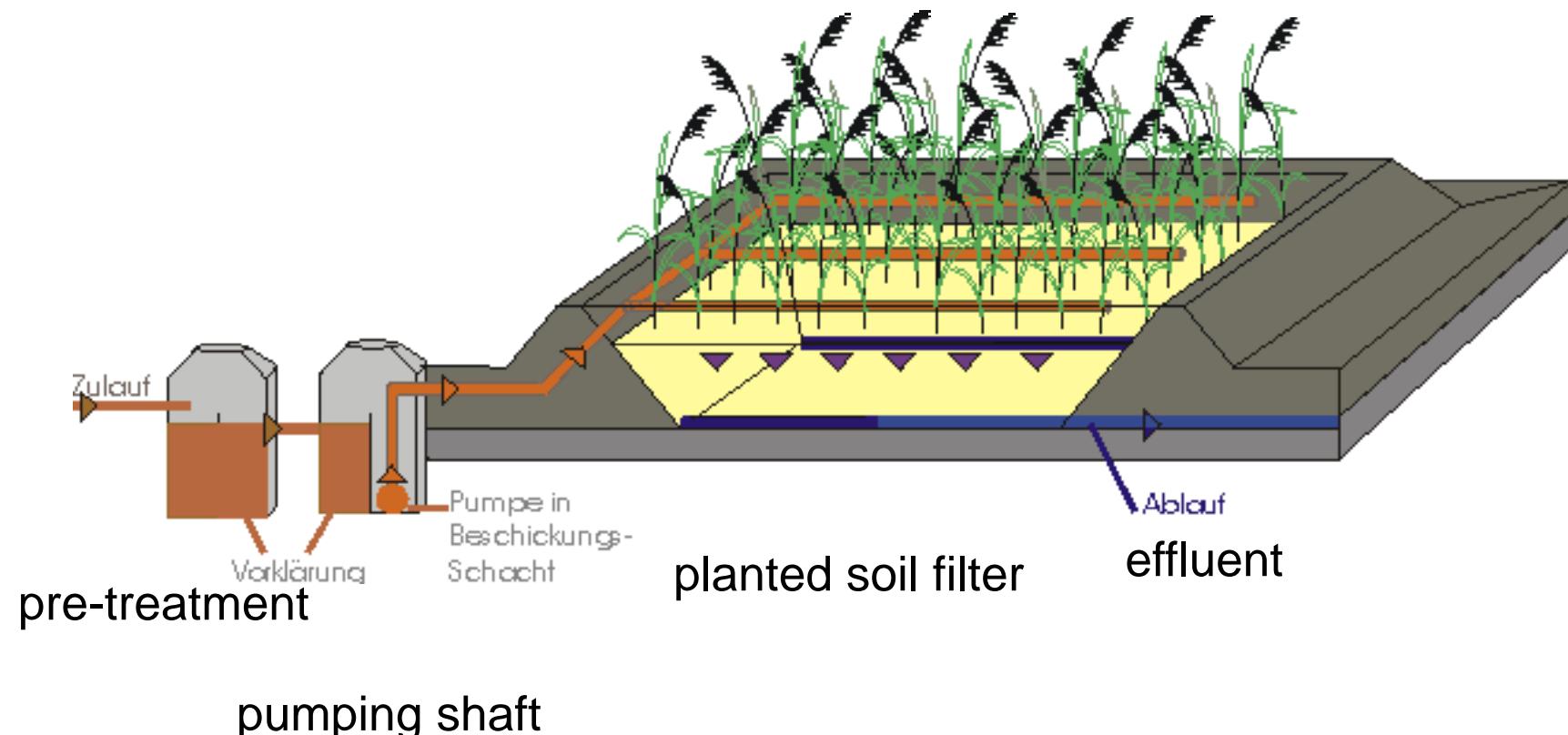
Wastewater Treatment, Vidrare

✗ Constructed wetland

- ✗ primary clarifier
 - ✗ Settling tank
- ✗ biological treatment
 - ✗ constructed wetland
- ✗ discharge/effluent
 - ✗ according to the European directives
- ✗ sludge treatment
 - ✗ treatment in municipal wastewater treatment plant

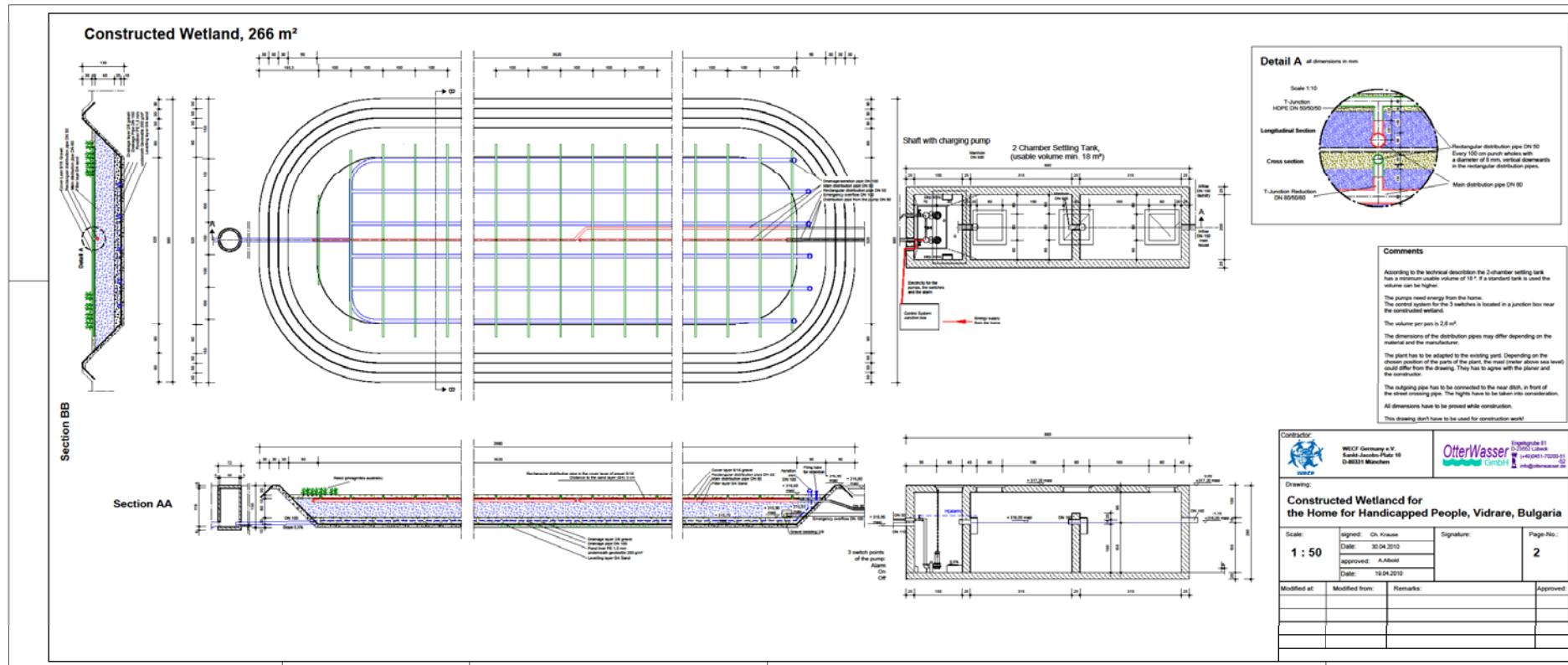
Wastewater Treatment, Vidrare

- Constructed wetland, scheme:



Wastewater Treatment, Vidrare

× Design for Vidrare



Wastewater Treatment, Vidrare

✖ Design for Vidrare

- ✖ different estimated loads in comparison to wastewater from households
- ✖ incoming load: 76 p.e.
- ✖ incoming hydraulic load: 95 p.e. (calculated acc. to bulgarian guidelines)
- ✖ pre-treatment: size depends on the hydraulic load
- ✖ biological step (planted filter bed): size depends on the spezific load of the number of inhabitants

Wastewater treatment plant, Vidrare

Primary clarifier

- ✗ Settling tank: 18 m³, including pumping shaft



Small wastewater treatment plant

Primary clarifier

- ✗ Settling tank: 18 m³, including pumping shaft



Wastewater treatment plant, Vidrare

Biological (second) step

- ✗ planted soil filter, 266 m²



Wastewater treatment plant, Vidrare

Biological (second) step

- ✗ planted soil filter, 266 m²



Wastewater treatment plant, Vidrare Biological (second) step

- ✗ planted soil filter, 266 m²



Wastewater Treatment, Vidrare

- Control shaft and outlet to the gutter
reuse of the existing effluent shaft



Wastewater Treatment, Vidrare

Residual materials

- ✗ **Sludge treatment**

- ✗ Primary sludge
settling tank: sucking van needed, controlled disposal

- ✗ **Planted soil filter**

- ✗ plants have to be cut in autumn, the reed can be composted
 - ✗ the sand has to be exchanged or washed if the soil filter is blocked

Wastewater Treatment, Vidrare Operation and Maintenance

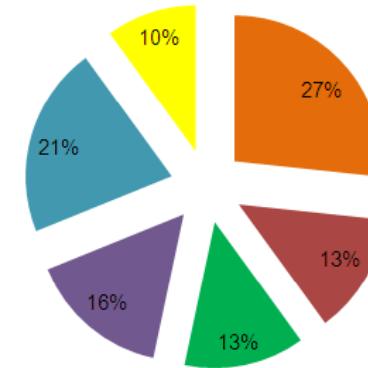
	daily	weekly	yearly
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General tasks			
General function control of the technical parts (warning device, control lamps)		x	
Operation diary	x		
Record water consumption	x		
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Treatment plant			
Pipes and manholes		1x	
Emptying the settling tank (pumping out the sludge)		2x	
Visual inspection of the surface of the constructed wetland (plants, weeds, dry zones, water on the surface et al.)	x		
Function control of the pumps		12x	
Visual control of the discharge	x		
<hr/>			
Maintenance			
Pumps	1x		
Analysing a sample of the effluent (frequency depends on the regulations of the water authority)	1x		

Wastewater Treatment, Vidrare Costs

✗ Investment costs

- ✗ Excavation and pipes
- ✗ Drainage pipes inkl. fittings
- ✗ Filling of the constructed wetland
- ✗ costs for design and applications

- Excavation and piping
- Liner (Geotextile and PE foil):
- Distribution Pipes, Drainage pipes inkl. Fittings
- Pre-Treatment
- Gravel, Sand
- Pumps incl. controller and cable



✗ Running costs

- ✗ Personel (1,5 h/week)
- ✗ Energy supply (ca. 2 kWh/d)
- ✗ Sludge disposal

Wastewater Treatment, Vidrare

Thanks to all the people who helps to realize this pilot project in Vidrare

