Decentral Sewage Treatment Plant based on Reed Bed Technology (PURE-STP) for a Labour Camp and Workshop in Qatar



In Doha Al Shahaniya (Qatar) BAUER Environment installed a decentral PURE sewage treatment plant for the local BAUER workshop and labour camp. The plant uses the reed bed technology where sewage is treated in constructed wetlands planted with reeds, mainly phragmites australis. The quality of the treated water allows its reuse for irrigation. The plant is designed for a population of approximately 70 labours.

The reed bed technology is well established in Europe and North America. A symbiosis of reed roots and the microbiological population accomplishes the treatment process biologically in interaction with the filter bed. At the PURE pilot plant in Qatar the technology is optimised for the local climatic conditions.

Results

BAUER Environment erected a hybrid type PURE-STP consisting of three basins. This kind of treatment plant does not require mechanical pre-treatment since the particular matter in the sewage is removed in the first two basins constructed as vertical filters whereas the treatment of the residual water is accomplished in the third basin – a horizontal filter.

Since the subsurface at the project site consists of compact and hard bedrock BAUER Environment chose a concrete block design for the erection of the basins. On the surface of a concrete bottom lining the PURE filter bed made of a special gravel mixture was installed.



Due to the hard bedrock BAUER Environment constructed the basins using concrete blocks.

In order to investigate which plants achieve the best treatment results under local conditions, the filter bed was planted with various types of reeds from different regions in the Middle East and Europe.

The treatment process includes the following steps:

The sewage sludge is discharged intermittently into the two vertical filter basins. They provide the dewatering and mineralisation of the sludge. After the removal of the particular matter the residual water drains to the horizontal filter of the third basin for the final biological treatment.

The treatment process lasts 5 to 10 hours. The quality of the treated effluent has been monitored continuously during operation. The analytical results show, that the target values for the re-use of treated sewage water for irrigation defined by the Supreme Council For the Environment and Natural Reserves of the State of Qatar are met.



The PURE-STP hybrid type includes the dewatering and mineralisation of the sewage sludge in the first two vertical basins. The treated sludge can be applied in green belts and agricultural areas to improve the soil quality.

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The treated water is used for irrigation. Thanks to the available irrigation water a green park could be established with various kinds of bushes, flowers and vegetables. Part of the effluent is used for irrigation in a nursery of reeds, which are grown for other PURE sewage treatment plants.

The reeds in the filter basins are cut twice a year and can be used as fodder, e.g. for camels, sheep and goats.

The treatment process is accomplished under aerobic conditions. Thus, no odour emissions occur. Furthermore, the reproduction of insects is avoided as a free water table only occurs for a limited period of time directly after the sewage discharge into the vertical basins.



Various types of reeds were planted to find out which plants achieve the best treatment results under local conditions



The PURE-STP represents an environmentally sound way of sewage treatment, which requires neither a connection to a central sewer system nor transport of sewage. Easy and reliable operation and a life-span of several decades makes it the appropriate treatment technology in remote areas. The client benefits from low operating costs. The treated sewage sludge can be applied in green belts and agricultural areas to improve the soil quality. The treated effluent is used as irrigation water for fodder cultivation or in green areas which contribute to the living guality in arid regions.

The environmentally sound PURE-STP is easy and reliable in operation. It provides irrigation water and contributes to the living quality in the arid area around the workshop.

Client:	BAUER International, Doha (Qatar)
Scope of works:	wetland design, planning and construction, operation of the sewage treatment plant
Project period:	February 2006 till now

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