International Workshop on Implementation and Operation of Municipal Wastewater Reuse Plants"
March 11-12, 2004, Thessaloniki, Greece

The workshop is organised in the framework of the EC funded project Aquarec and is supported by EUREAU. The Aquarec project has already mapped more than 3,000 reuse facilities world-wide and is performing a detailed survey on management practices at a large number of selected facilities. Successful water reuse strategies can only be selected with a sound view on implementation and operating issues, while efficient use of the available resources during the operating period has proven to provide spectacular savings and helped produced a definite change in attitude towards water reuse practices.
By participating to this workshop you will have the opportunity to share, learn and discuss operational water reuse REAL experience with respect to a.o. ownership, funding opportunities, public acceptance, O&M, water quality control and failure management. The workshop builds on the perspective and experience of water utilities in charge of producing and distributing reclaimed water.

Workshop Program

March 10, 2004

19:15 Welcome drink, Registration - Capsis Hotel

March 11, 2004

08:10 Capsis Hotel - Bus Departure to Workshop venue (Technology Park)
08:15 Electra Palace Hotel - Bus Departure
08:20 ABC Hotel - Bus Departure

08:50 Registration

09:00 **Workshop Opening, Welcome**
Prof. Anastasios Karabelas, CPERI (GR)
09:05 **Introduction of the first day**
Chris Thoeye, Aquafin NV (BE)

Introductory session

Chair: *Prof. Anastasios Karabelas, CPERI (GR) – Chris Thoeye, Aquafin NV (BE)*

09:10 Aquarec Project - Overview
Thomas Wintgens, RWTH Aachen - Chemical Engineering (DE)
09:20 Municipal wastewater reclamation: where do we stand? An overview of treatment technology and management practice.
Davide Bixio, Aquafin NV - Flemish wastewater company (BE)
09:30 Wastewater recycling and reuse in Eureau countries: necessity for establishing guidelines
Dr Andreas N. Angelakis, EUREAU and N.AG.RE.F. - Institute of Iraklion (GR)
09:55 Evaluation of the Turkish reuse standards and the compliance status
Prof. Celal Gokcay et al. , Middle East Technical University (TR)

10:05 Coffee break and networking

15:55 Brainstorm on key-issues

16:55 Conclusions of second day
Chris Thoeye, Aquafin NV (BE) – Michael Muston, University of Wollongong (AU)

17:05 Closing of workshop
Prof. Anastasios Karabelas, CPERI (GR)

17:15 Bus departure to hotels

POSTERS 11 & 12 March 2004

1. Best Practice Examples for Reuse of Wastewaters in Agricultural Irrigation in the World
   Aysegul Aksoy, Middle East Technical University

2. Municipal Wastewater Management in Turkey: Impacts and Reuse
   Imamoglu Ipek, Middle East Technical University

3. Inactivation of Enteric Microorganisms with Peracetic Acid (PAA) and combined PAA/UV treatments
   Koivunen J. & Heinonen-Tanski H. University of Kuopio

4. UV disinfection and reactivation of secondary level effluent for agricultural water reuse in Korea
   Kwang-Wook Jung, Chun G. Yoon, Ji-Hong Jeon and Jong-Hwa Ham
   Department of Rural Engineering, Konkuk University

5. Converting Waste Water to Drinking Water
   Mayr Bernard, Envicare

6. Mediterranean Network on Wastewater Reclamation and Reuse
   Roldan Lopez Ramon, Agbar Foundation

7. Study of Tertiary Filtered Municipal Wastewater Irrigation on Vegetable Crops in Southern Italy
   P. Rubino , A. Lonigro, A. Caliandro, University of Bari

8. Advanced Municipal Wastewater Treatment by Ultrafiltration & Microfiltration
   O. Uzan-Silner1, R. Messalem, A. Brenner, G. Oron, Ben Gurion University of the Negev

process- and environmental engineering, food- and biotechnology

Abstract

Wastewater reuse - Thessaloniki

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MEMJET® – Converting waste water to drinking water

An increasing shortage on high quality drinking water is expected in the forthcoming century, this leads to intensive research on new water resources. One way of providing these resources is the use of innovative membrane systems in the field of communal wastewater treatment, as shown on the conventional waste water plant of the community St. Peter o. Judenburg/Austria.

First of all the original wastewater plant, built in 1989 as a ventilated pond purification plant (see left pic.), had to be converted. Two of the three existing lagoons were put out of service, while the remaining lagoon was equipped with a ejector aeration system and a partition wall to create a separate settling basin. In this area sludge is collected and recirculated, the excess sludge is removed with the primary sludge.

Furthermore lagoon 1 acts as a rainwater buffer basin. To guarantee the stipulated values the whole year (in particular in winter with air temperature below –20°C) the WWTP was equipped with a MEMJET® membrane filtration system, situated in an existing basin used as fixed-bed nitrification in the original plant design. The microfiltration unit consists of polyethylene hollow fibre membranes with a nominal pore size of 0,4 µm which are able to retain pathogenic germs. The MEMJET® process unites three membrane modules at a time, with single hollow fibres oscillating horizontally in the wastewater. The motion is strengthened by a coarse-bubble ventilation situated below the module. The operation mode is intermittent, which allows back flushing with permeate. Due to the design of the plant there

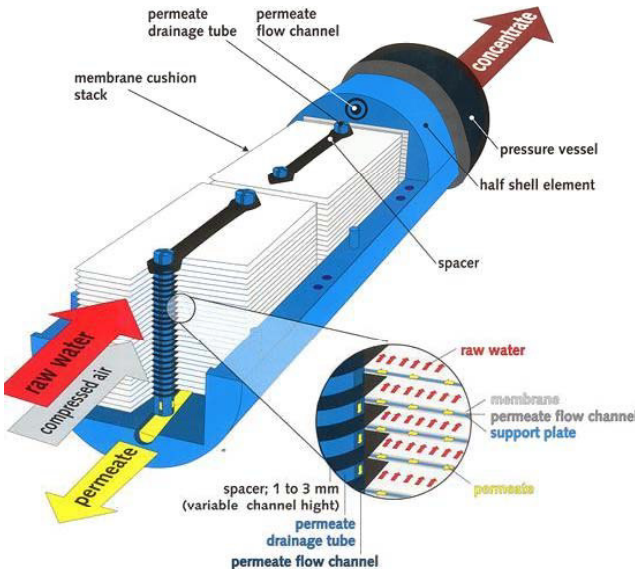
is no denitrification possible. Firstly the volume of the MBR is too small to denitrificate in the anoxic areas and secondly the necessary easy degradable carbon is already consumed in lagoon 1.

The following advantages are obvious. Energy consumption of the plant is equal to a conventional WWTP. Most of the dissolved organic matter is degraded in the nitrification basin (MBR).

The basin is due to of technical matter constantly aerated by the coarse bubble system.

Ammonia and dissolved organic matter are degraded nearly complete and the stipulated values can be guaranteed throughout the year. Other important advantages are the low cost expansion of the existing plant, no extra space is needed and any kind of receiving river/lake/groundwater can be used because the permeate is free of solids and there are no pathogenic germs and bacteria in the permeate.

For a case study the permeate of the MBR was fed into a nanofiltration unit to produce drinking water regarding to the values of the Austrian guideline on drinking water.



This second filtration unit acts as a second barrier for pathogenic germs and bacteria, furthermore polyvalent ions and greater molecules are confined to a certain extent. The nanofiltration unit uses flat module membranes out of polyamide situated in a pressure tube. Experiments on the pilot plant proofed that a constant excellent permeate quality is essential for the operation of the nanofiltration. The chemical and microbiological values of the so produced pure water were validated by an officially approved laboratory after 6 weeks of stable operation without chemical cleaning or pre-treatment.

Summarizing it can be stated that the production of drinking water meeting the Austrian legal limits is feasible as long as the MBR System is able to degrade nitrogen to a high degree, thus a separate and controlled denitrification step is unavoidable.

More information: www.envicare.at

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