Efficient Fun
Carina Pötzsch is in charge of water management at the Europa Park

Energy, water, area – recreational parks undeniably have a high rate of consumption. But while it can't be denied, it can indeed be helped. The „Europa Park", Germany's largest leisure amusement park, was awarded a certificate last year as a „Green Amusement Park" for its commitment to sustainability. The Mack family, its owners, have hired, among others, an alumna of the University of Stuttgart to ensure economic use of water.

33.2 liters: that's how much water is needed on the average for each visitor to the Europa Park. And more must be added for the dizzying roller coaster rides over water, fjord rafting, locomotive rides, the tranquil water fountain displays in the more than 500-year-old castle park, or just for trips to the bathroom. Hotel accommodations and swimming pools add even more to the total. 33.2 liters are really not much for an amusement park that is one of Germany's largest providers of water attractions. But with about five million guests annually, this adds up to 166,000 cubic meters – enough to fill 66 olympic swimming pools.

Water is, in fact, in abundant supply in the Rhine plain around the town of Rust, where the Europa Park is located. Carina Pötzsch explains: „We're sitting here on a gigantic table water reservoir which feeds a system of wells deep underground." Pötzsch, an Environmental Technology graduate of the University of Stuttgart, has been head of the Europa Park Water Management Department since September 2015 and is also responsible there for energy management and waste management issues. It's a new position, and the second one created especially in the area of environmental protection – just one indication that the Mack family which owns the park has taken ecologically responsible behavior upon itself as a goal.

Even Small Steps Are Important

It's clear to 28-year-old Pötzsch that every action, big or small, counts: in spite of its seeming abundance, water remains a precious and sensitive resource. „Both the authorities and the communities in the surrounding region take very great care to ensure that the water table does not drop." Preventing such an occurrence is the target of a plethora of large and small initiatives. For example, a centralized system for processing water reduced the consumption of groundwater used to supply artificial lakes and water-based attractions by 50%, and in addition the park's own water works annually supply one million kilowatt hours of environmentally friendly current. Used water is systematically cleaned and returned into the system.

Small steps save water too, however; for example, the park's plants are watered under digital control, and thus to better effect. Taken together, all of these steps have shown results: regular checks and calculations of the underground wells to find whether a so-called „funnel effect" has occurred due to water draw-off has shown that: „The effects are marginal," as Pötzsch says.

In addition to water quantity, water quality also poses a challenge. While not every pool must have bathwater quality, it must nevertheless be visually unobjectionable and hygienically attractive. „Our visitors expect to experience fresh water, not pools green with algae," explains Pötzsch. The likelihood of algae is a challenge, along with the high levels of iron and manganese in the Rhine plain's groundwater, and that requires a filtering system.

A Workplace in the Underworld

As a result, the workplace of Carina Pötzsch is not the glittering world of the Europa Park's 94 hectares, with more than 100 attractions and shows and 4,500 hotel beds. Her „kingdom", one level below ground, is less spectacular. In the technical

Minimum consumption, maximum quality: those are Carina Pötzsch's guidelines for water management at the Europa Park.

Photo: Uli Regenscheit

equipment areas there, man-sized filtering containers filled with sand stand row on row. As the water trickles through the sand it is cleaned biologically and can be returned as clear water to the environment. It is a tried and true technology, but has two drawbacks: the barrel-shaped containers take up much space, and a great deal of water is required to clean out the clotted sand itself.

Therefore Carina Pötzsch has set up a trial facility at one of the hotels to test a so-called „alluvial filter". The technology, still little-known in Germany, comes from the USA and strains used water through perlite, a rock formed from volcanic glass and found in nature. Perlite forms a fine-pored filtering „cake" which is deposited on tubes and subjected to flowing water from swimming pools. This filter technology not only cleans very effectively but also saves up to 70% of water, along with space and electric current.

A Gigantic Water Park

If the technology proves effective, it will be used in a new water park. An „adventure world" will be erected in several stages of construction on an area between the Autobahn and the Europa Park and will offer water slides of all kinds, a swimming pool with artificial waves, a surf simulator, a „Lazy River", and other highlights for „water rats". A wellness area will be added, together with another hotel. The area planned for expansion will be 120 hectares in size and thus twice as large as the Europa Park. Already, 5,000 visitors a day are expected from 2018 on during the first stage of expansion.

The project, expected to cost hundreds of millions, Is not viewed with unmixed enthusiasm among those living in the area, who also advance objections related to water issues. The additional requirement of drinking water alone is presently calculated to be 150,000 cubic meters. Even in the Upper Rhine Rift, where water is abundant, concern has been voiced regarding the groundwater. Others fear that the piping capacities will be inadequate. However, such apprehensions were calmed in a series of people's forums – not least because the Mack family plans to drill its own deep well and to assume the costs for expansion of the infrastructure. Nevertheless, it will remain a challenge to deal conservatively with water and to process used water in such a way that as much of it as possible can be returned, says Carina Pötzsch. The new alluvial filters are viewed as a major contribution in this regard.

Pötzsch's first contact with the new water recycling technology came during her studies in environ-

Carina Pötzsch in one of the Europa Park's technical equipment areas. Behind her: sand-filled filter containers for biological water purification.

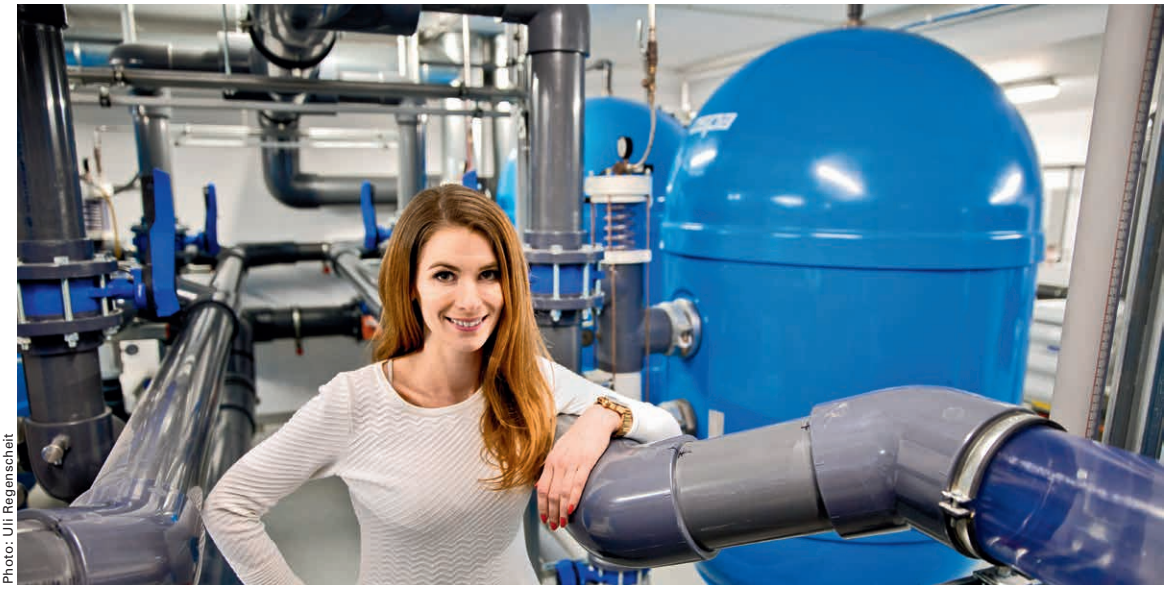

Photo: Uli Regenscheit

mental technology at the University of Stuttgart. „Above all, the main courses were very useful for actual practice; we got a good idea of the available technology and where to get information about it. In my present job, I can apply much of what I learned there one-to-one!"

Why did she, an engineer, choose this field? „Because environmental protection is a future-oriented issue," and also because it covers so many diverse areas. But water intrigued her only gradually and to her own surprise, says Carina Pötzsch with a laugh. But then she became fascinated: „Water resource economy lets me work with entire systems. That's a lot more interesting than working for years to optimize a rubber separator lip."

Andrea Mayer-Grenu

Studying Environmental Technology

Protecting the environment poses major challenges for both industry and for the emerging and developing nations. Many countries of the world are wrestling with urgent problems regarding water, air and soil pollution as well as energy supplies, the infrastructure, and mobility. Solving these difficulties requires cross-disciplinary collaboration involving solutions from both technology and the natural sciences. Self-renewing environmental protection today is mostly replaced by preventive protection: integrated solutions, the creation of closed loops, avoidance of waste, resource protection, and increased energy efficiency are just a few of the issues at the forefront of any commercial effort in this area. With all this in mind, the University of Stuttgart started early back in 1993 by setting up a course of studies for a diploma in Environmental Technology; in 2008 it was converted to the new Bachelor's and Master's Degree system. With great success: study courses are now offered by more than 45 institutes covering almost every discipline relevant to the area of environmental technology. Currently, a total of about 650 students are enrolled in the University of Stuttgart's Environmental Technology Studies Program, and more than 35% of them are women – far more than in other engineering disciplines.

The Editors