

EDITORIAL

Conference season has started again, and KWB's scientists will be presenting their research results on national and international symposia. All major events where you can meet us are listed at the end of this newsletter and we cordially invite you to participate.

Simultaneously, we receive an increasing number of visitors and delegations from home and abroad. We are particularly glad that KWB will host for one day the GREEN TALENTS delegation which is given access to Germany's research elite by the German Federal Ministry of Education & Research (BMBF). Under the patronage of the Minister of State Professor Johanna Wanka, a high-ranking jury of German experts has selected 25 young researchers from numerous countries and scientific disciplines who will visit German research institutions and enterprises during a two-week round trip. Besides KWB, the delegation will be welcomed by ThyssenKrupp, Henkel AG, Fraunhofer Fokus and Ecologic. We at KWB will provide the GREEN TALENTS with a comprehensive insight into our current research activities in the fields of wastewater treatment and stormwater management. [→ www.greentalents.de](http://www.greentalents.de)

Andreas Hartmann, Edith Roßbach
Kompetenzzentrum Wasser Berlin, Managing Directors



Photo © Marlene Eitischig

LATEST NEWS



Foto © TU Berlin

ASKURIS Team

Trace Organic Contaminants in the Urban Water Cycle

Closing event of the projects ASKURIS and IST4R

In the past three years, both collaborative projects which were managed by the Department of Water Quality Control TU Berlin, investigated on a pilot scale the technical removal of trace organic contaminants as tertiary treatment scheme for wastewater treatment. The focus was on ozonation and treatment with activated carbon. Further studies dealt with the analysis of trace elements in the urban water cycle, their effect on humans and the environment as well as with issues related to the perception of risks. Comprehensive final project reports will soon be published.

[→ www.ASKURIS.tu-berlin.de](http://www.ASKURIS.tu-berlin.de)

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Launch of new project to develop rapid tests for predicting removal of trace organic contaminants (TrOC)



Bundesministerium
für Bildung
und Forschung

TestTools:

The project TestTools is supposed to replace complex pilot tests which have been necessary so far for the technical planning of trace organic contaminant removal in sewage plants. The joint project is managed by TU Berlin in cooperation with Berliner Wasserbetriebe and KWB. It is funded by the German Federal Ministry of Education and Research (BMBF) within the BMBF funding measure "Risk Management of Emerging Compounds and Pathogens in the Water Cycle (RISKWa) and succeeds the project ASKURIS.

Large scale TrOC removal schemes such as activated carbon treatment, but also ozonation and natural treatment steps almost always require preliminary complex pilot tests with long-term trial periods of more than one year. These facts were also an issue for ASKURIS and other projects within the BMBF funding programme

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WASTEWATER RESEARCH

at the Berlin Centre of Competence for Water



Photo © private

INTERVIEW WITH DR.-ING. ULF MIEHE, HEAD OF THE "WATER AND WASTEWATER ENGINEERING DEPARTMENT" SINCE JULY 2015.

Dear Colleague, you have been employed by KWB for more than five years and have managed several major projects on wastewater treatment. For all those who do not yet know you – what is your educational and professional background?

I studied Environmental Technology at the Technical University of Berlin and after excursions to soil sciences and environmental chemistry, I prepared my diploma thesis at the Chair of Water Quality Control. This was the first time that I came into contact with KWB as I had the opportunity to present this thesis at a workshop in 2006. From 2006-2009 I worked as scientific assistant at the Chair of Water Quality Control (Professor Martin Jekel) at the TU Berlin and did my PhD within the framework of the "Barrieren" project of Berliner Wasserbetriebe. This involved the removal of trace organic contaminants from the different Berlin wastewater treatment plants with a focus on wastewater filtration. I am still interested in these topics today. In 2009 I started work at KWB and was immediately involved in the development and management of the OXERAM project.

What research topics were in the focus of your work at KWB during the past years? Were there any special highlights for you?

The clear focus of my work during the past years was on studies at technical scale of tertiary treatment schemes. Phosphorus removal by micro sieving, membrane filtration and flocculation filtration (OXERAM), elimination of trace substances by ozonation and closed-loop control of ozonation (ASKURIS and IST4R) or wastewater disinfection by UV radiation or performic acid (OXERAM/Demoware): Basically, my work focussed above all on possible measures for the further treatment of wastewater. The OXERAM project was particularly

exciting for me because of the width of the topic but also the close co-operation with BWB, TU Berlin and Veolia.

The whole world talks about energy and resource efficiency. Do you think that these topics are sufficiently considered in the wastewater industry?

I think that the water industry is well aware of these issues, in particular when they have a direct impact on the operating costs. For that reason major steps are being undertaken such as the optimisation of aeration but also the increase in gas yield during digestion. Many ongoing projects such as the BMBF programme ERWAS and the newly launched EU project PowerStep indicate a major change. I am very optimistic that in 10-20 years a large number of wastewater treatment plants will generate more power than they consume calculated on annual basis. Since my scientific roots are in the field of wastewater treatment, I would like to underline that concepts on energy positive wastewater treatment plants must comply with the treatment goals in the same way as today's wastewater treatment plants.

Back to trace organic contaminants: Much research has been done in this field. Are there nonetheless still open questions?

Four years ago I thought we should be through with the topic, but this was an error. In particular the more accurate analytics, e.g. in the project ASKURIS, have shown that we will time and again encounter substances in the urban water cycle that nobody focussed on before. In an increasingly complex world and given the growing substance diversity many questions can often not be finally and conclusively answered: e.g. the formation of by-products during ozonation or the long-term effect of trace substances

on fish and other aquatic organisms. For me it is more important to ask whether we know enough in order to be able to take a decision. This also includes a dialogue of the environmental authorities and the water industry with the public at large. Whether citizens and companies are ready to pay every year a small but extra amount for water protection and precautionary drinking water protection is not a technical but a social policy issue.

What are the current research projects on wastewater treatment KWB is currently dealing with? What is the roadmap for future research?

In July 2015 the Horizon 2020 project POWERSTEP was started which we co-ordinate. Practical tests will deal with various aspects of energy positive wastewater treatment plants. And studies on trace substances will continue as well: Only three weeks ago the German Federal Ministry for Education & Research (BMBF) approved the TestTools project. Together with TU Berlin and Berliner Wasserbetriebe test systems will be developed in order to get information about the removal of trace substances within a shorter period of time. The subjects we will focus on in future will also depend on current developments. This includes, for instance, the sulphate issue in the River Spree or the discharge of microplastics from surface waters. But the future strategic orientation of KWB also plays a major role. Since Veolia will soon retire as the main shareholder, our local owners, Berliner Wasserbetriebe and Technologiestiftung Berlin, have a unique opportunity to create together with us KWB 2.0. ●

Thank you very much for this interview. Bodo Weigert asked the questions

WATER RESEARCH IN BERLIN AND BRANDENBURG



Photo © Luis Sala



Reuse of Treated Wastewater

For 18 months, the EU FP7 collaborative project DEMOWARE has been working on how to increase the utilisation of wastewater reuse schemes. For this purpose, extensive field experiments were performed at several European test sites. The collaborative project which is co-ordinated by the Spanish Water Research Centre CTM CENTRE TECNOLÒGIC is realised by a consortium of 20 European partners. The project has a total volume of 10.5 million € and is funded by the EU with 6 million €.

Using nine existing demonstration sites distributed all over Europe, practical tests are being performed with regard to wastewater treatment processes and reuse schemes, process monitoring and performance control, risk and environmental benefit analysis, business models and pricing strategies as well as governance and decision making. Project outcomes are used for the development of a currently planned water reuse site. In the coastal town of El Port de la Selva in Catalonia, KWB supports the implementation of demonstration trials aiming at the indirect reuse of treated wastewater for drinking water purposes. The basins for groundwater recharge are currently under construction (see photo) and will be operated from November 2015 onwards. The cause for the strikingly high values of the effluent's conductivity detected during the first monitoring campaigns was found in the meanwhile: During stormy weather seawater infiltrated into a damaged sewer section. In addition, KWB has carried out disinfection trials at a wastewater treatment plant in Brunswick by means of UV radiation and performic acid. Both methods obtained similar treatment results. The process costs depend on the plant capacity and amount to 1.8 to 6 ct / m³.

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Limitation of Nitrogen Emissions to Surface Waters

Most inland waters in Germany will not meet the good ecological status requirements stipulated in the EU Water Framework Directive by 2015. It was previously assumed that phosphorus is the primary determinant of water quality.

The NITROLIMIT I project demonstrated that nitrogen (N) is a significant factor for water quality. Accordingly, not only the reduction of phosphorus (P) but also of N is ecologically meaningful. For this reason, it is recommended to reduce both the entries of P and N into lakes. For economic considerations, catalogues about measures for nutrient reduction, their efficiency and expenses have been created and their economic feasibility analysed. In NITROLIMIT II, specific target values for N and P concentrations contributing to the good ecological status of water bodies are being verified in order to support decision makers. This way, the knowledge gap related to the N and P turnover in freshwaters will be closed. In addition, the project aims to determine the costs and efficiency of reduction measures and also the farmers' willingness to contribute to environmental protection measures. Due to the high utilization pressure on the Berlin agglomeration, water quality improvement concepts considering both N and P are being drawn up taking the River Dahme catchment and the urban course of the river Spree as an example. KWB assists the project team which is headed by BTU Cottbus – Senftenberg with the preparation of ecosystem models and a life cycle assessment describing the environmental impacts of stormwater management measures.

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Photo © KWB

Within the project KURAS new approaches for the sustainable management of wastewater and stormwater were developed and are currently checked for efficiency through model calculations. In the scope of the priority area Stormwater Management, 27 common measures were assessed regarding their impacts on the quality of life of inhabitants, on the environment and on economic efficiency. Based on the results, suitable combinations of stormwater measures were developed for the Berlin areas Alt-Schöneberg and Southern Pankow. The developed combinations also took stakeholder interests into account (e.g., representatives of real estate administrations, environmental associations, public authorities on state and district level and the water utility Berliner Wasserbetriebe). The expected impacts are currently being identified by model calculations.

Within the priority area Sewage Systems operational and constructive measures that have a high potential to reduce challenges during heavy rainfall events and extended dry weather periods were identified on the surface, in sewer systems, in pumping stations and at WWTPs. The impacts of these measures and their combination are currently being studied in a model area by means of simulation studies with the aim to develop integrated solutions.

Within KURAS KWB is responsible for the coordination of the priority area Stormwater Management and the four work areas Sewer Simulation, Groundwater, Surface Waters and Life Cycle Assessment. The project is funded within the programme "Smart and Multifunctional Infrastructural Systems for Sustainable Water Supply, Sanitation and Stormwater Management (INIS)" issued by the Federal Ministry of Education and Research (BMBWF). KWB receives co-funding by Berliner Wasserbetriebe and Veolia.

→ www.kuras-projekt.de

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>> continuation of page 1 (TestTools)

With regard to the technical processes, the best practice for operation needs to be identified by screening the influence of the process parameters. But this is an expensive and time-consuming strategy, and the results obtained at the test site might not be transferable because of the different water quality. Many studies carried out at sewage plants in North Rhine Westphalia, Baden-Wuerttemberg and Berlin clearly point to this problem.

In the scope of the project Test Tools a set of tools is to be developed providing for the rapid (within one month) and inexpensive prediction of the efficiency of technical and natural TrOC removal schemes. The tools to be developed will consist of lab tests and parametric modelling. They will be calibrated in pilot trials in Berlin and validated in comparison with pilot results obtained in other regions of Germany. KWB will be responsible for the method development with regard to the ozone applications including a nationwide practice test. ●

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Photo © BWB



EVENTS

Meet us at the following upcoming events:

2 October 2015

G7 Alliance for Resource Efficiency

Organiser: Bundesministerium für Wirtschaft und Energie
Venue: BMWi Berlin → www.bmw.de

5-9 October 2015

Phosphate Fertilizer Production Technology

Organiser: IFDC/IFA
Venue: Ramada Plaza Berlin City Centre Hotel and Suites
→ <http://ifdc.org/phosphate-fertilizer-production-technology-with-ifa/>

7-8 October 2015

5th Aqua Urbanica

Organiser: FEI e.V. Stuttgart, iswar Universität Stuttgart
Venue: MPI Festkörperforschung, Stuttgart, Germany
→ www.samuwa.de/events/5_Aqua_Urbanica/?_locale=de

7-8 October 2015

8. CMM Tagung

Organiser: Kompetenzzentrum für Materialfeuchte (CMM) am KIT
Venue: Akademie Hotel Karlsruhe
→ www.cmm.kit.edu/62_690.php

30 October 2015

DPP Forum 2015

Organiser: Deutsche Phosphor Plattform DPP e.V.
Venue: Landesvertretung des Freistaates

FOCUS

Everything Flows – A German Water Balance

Authors:

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Enno Nilson, The German Federal Institute of Hydrology (BfG)

→ www.bmbf.wasserfluesse.de/?lang=EN

The online information service offered by the German Federal Ministry for Education and Research (BMBF) provides a wide range of online-data and information graphics relating to water availability in Germany. An interactive map displays regional precipitation balances, inflows from surface waters, climate change scenarios and much else. Additional information on “Artificial Water Flows” such as drinking water supply, process water consumption and virtual water flows provide valuable insights into the regional differences in water yield throughout Germany. ●

Bayern in Berlin

→ www.deutsche-phosphor-plattform.de/de/Forum_2015.html

2-3 November 2015

5th Internationales Symposium RE-WATER Brunswick

Organiser: SE|BS Stadtentwässerung Braunschweig GmbH, together with the Institute for Urban Water Management of TU Braunschweig, Kompetenzzentrum Wasser Berlin and Wastewater Association Brunswick
Venue: Brunswick, Germany
→ <http://re-water-braunschweig.com/>

2-6 November 2015

AIWW – Amsterdam International Water Week

Organiser: raiAMS, IWA, NWP, IWC
Venue: Amsterdam
→ <http://internationalwaterweek.com/>

This summer KWB has become a member of German Water Partnership



Member of

German Water Partnership



Cover photo © totalpics | istockphoto.com

Our annual report in the web.

→ [Download](#)

about us

The Berlin Centre of Competence for Water (Kompetenzzentrum Wasser Berlin, KWB) is a public-private partnership company. Its associates are the Technologiestiftung Berlin, the Berliner Wasserbetriebe, the Berlinwasser Holding and Veolia. Through its network activities, the KWB strengthens Berlin's position as an international centre in the field of water economy and technology. Partners and actors are scientific facilities, public institutions, companies as well as multipliers from public and private sectors.

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