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EDUCATION

Doctorate in Environmental Engineering (Dr.-Ing.), Technical University of Berlin, Germany 1997

Master degree in Environmental Engineering (Dipl. Ing.), Technical University of Berlin, Germany 1992

EXPERIENCE

10/2024-present: CEO and co-Founder, Waterloo Solutions GmbH

8/2013-present: Chair Professor. Chair of Urban Water Systems Engineering. Technical University of Munich, Germany.
Academic Program Director, Environmental Engineering Program; Member, TUM Appointment and Tenure Board.

8/2013-12/2018: Affiliated Research Professor, Civil and Environmental Engineering, Colorado School of Mines, Golden CO, USA.

8/2011-7/2013: Director of Research. NSF Engineering Research Center on Reinventing the Nation Urban Water Infrastructure (ReNUWIt). Stanford, UC-Berkeley, New Mexico State University and Colorado School of Mines, USA.

3/2010-7/2013: Professor, Civil and Environmental Engineering, Colorado School of Mines, Golden CO, USA.

8/2010-8/2013: Visiting Professor and Associate Director. Water Desalination and Reuse Center (WDRC), King Abdullah University of Science and Technology, Thuwal, Saudi-Arabia.

4/2010-present: CEO and Founder, Drewes Environmental, LLC, Golden, CO, USA

7/2007-12/2019: Adjunct Professor, UNSW Water Research Centre, The University of New South Wales, Sydney, Australia.

4/2006-3/2010: Associate Professor, Environmental Science and Engineering Division, Director and Founder, Advanced Water Technology Center (AQWATEC). Colorado School of Mines, Golden CO, USA

8/2001-4/2006: Assistant Professor, Environmental Science and Engineering Division, Colorado School of Mines, Golden CO, USA.

9/1999-7/2001: Associate Director, National Center for Sustainable Water Supply (NCSWS), Arizona State University, Tempe, AZ, USA

8/1997-8/1999: Visiting Professor, Arizona State University, Tempe, AZ, USA

7/1992-7/1997: Research Associate, Technical University of Berlin, Germany.

7/1982-6/1984: Secondary Lieutenant, Platoon Leader, German Armed Forces

RESEARCH INTEREST

Advanced water treatment processes (sequential biofiltration; membrane processes; ozone; advanced oxidation processes; activated carbon adsorption; UV-LED irradiation; sonolysis); novel design approaches for natural and engineered treatment systems; distributed non-potable water reuse; potable water reuse; monitoring strategies and treatment performance assessments to assure public and environmental health; state-of-the-art analysis of emerging trace organic chemicals (pharmaceutical residues, household chemicals, PFAS) and pathogens (including viruses and antibiotic resistance) in natural and engineered systems.

AWARDS

2023	Bavarian State Medal for outstanding services to the environment, State of Bavaria, Germany
2022	William Dunbar Medal, European Water Association (EWA)
Since 2020	Member, Advisory Council to the German Government on Global Change (WBGU)

2018	Fellow, International Water Association (IWA)
2007	American Water Works Association Rocky Mountain Section Outstanding Research Award
2003	Dr. Nevis Cook Graduate Teaching Award, Colorado School of Mines
1999	Quentin Mees Research Award for outstanding water-related environmental research in the State of Arizona
1998	Willy-Hager Award for outstanding research in the field of water and wastewater treatment, Germany

PROFESSIONAL SERVICE

2020-2023	Chair, Science Advisory Panel for Chemical of Emerging Concern in Ambient Water, State of California
2021-2022	Member, Expert Panel on Direct Potable Reuse in the State of California, National Water Research Institute
2020-2021	Chair, Expert Panel Future Water Supply Bavaria, Bavaria State Government.
2020-2024	Member, 'Water Research', German Science Foundation (DFG)
2020-2021	Chair, Expert Panel, Water Future of the State of Bavaria, Government of the State of Bavaria
2020-present	Associate Editor, <i>ACS Environmental Science & Technology Water</i>
2019-present	Member, Strategic Council, International Water Association (IWA)
2013-2020	Editor, <i>Journal of Water Reuse and Desalination</i> , IWA Publishing
2013-2019	Chair, International Water Association (IWA) Water Reuse Specialist Group
2018-present	Co-Chair, Drinking Water Commission, Federal Ministry of Health/German Environment Agency
2017-2018	Member, Advisory Panel for the Development of Minimum Requirements for Water Reuse, EU Joint Research Council (JRC)
2017-2018	State of California/National Water Research Institute, Direct Potable Reuse Expert Panel
2017-present	Member, Research Advisory Council, Water Research Foundation (WRF)
2013-2015	Panel Member, U.S. National Academies' Panel on Gray Water Reuse
2008-2011	Panel Member, U.S. National Academies' Panel on Water Reuse
2009-2012/ 2017-2018/ 2020-2022	Chair, Science Advisory Committee on Compounds of Emerging Concern in Recycled Water, California State Water Resources Control Board

PUBLICATIONS (Selection, h-index 67, Scopus)

Papers in peer-reviewed journals

- Drewes, J. E. & Jekel, M. (1996). Simulation of Groundwater Recharge with Advanced Treated Wastewater, *Water Science & Technology* **33**, 10-11, 409-418.
- Drewes, J. E. & Jekel, M. (1998). Behavior of DOC and AOX using advanced treated wastewater for groundwater recharge. *Water Research* **32**, 10, 3125-3133.
- Bouwer, H., Fox, P., Westerhoff, P. & Drewes, J.E. (1999). Integrating water management and re-use: causes for concern? *Water Quality International*, Jan/Feb, 19-22.
- Drewes, J.E. & Fox, P. (1999). Fate of natural organic matter (NOM) during groundwater recharge using reclaimed water. *Water Science & Technology* **40**, 9, 241-248.
- Drewes, J.E. & Fox, P. (2000). Effect of drinking water sources on reclaimed water quality in water reuse systems. *Water Environment Research* **72**, 3, 353-362.
- Drewes, J.E. & Fox, P. (2001). Source Water Impact Model (SWIM) – A new planning tool for indirect potable water reuse systems. *Water Science & Technology* **43** (10), 267-275.
- Drewes, J.E. & Croue, J.-P. (2002). New approaches for structural characterization of organic matter in drinking water and wastewater effluents. *Water Science & Technology – Water Supply* **2**, 2, 1-10.
- Drewes, J.E., Heberer, T. & Reddersen, K. (2002). Fate of pharmaceuticals during indirect potable reuse. *Water Science & Technology* **46**, 3, 73-80.
- Drewes, J.E., Heberer, T., Rauch, T. & Reddersen, K. (2003). Fate of pharmaceuticals during groundwater recharge. *J. Ground Water Monitoring and Remediation* **23**, 3, 64-72.
- Drewes, J.E., Reinhard, M., & Fox, P. (2003). Comparing microfiltration-reverse osmosis and soil-aquifer treatment for indirect potable reuse of water. *Water Research* **37**, 3612-3621.
- Rauch, T. & Drewes, J.E. (2005). Quantifying biological organic carbon removal in groundwater recharge systems. *Journal of Environmental Engineering*, 909-923.
- Rauch-Williams, T. & Drewes, J. E. (2006). Using soil biomass as an indicator for the biological removal of effluent-derived organic carbon during soil infiltration. *Water Research* **40**, 961-968.
- Drewes, J. E., Quanrud, D., Amy, G. & Westerhoff, P. (2006). Character of Organic Matter in Soil-Aquifer Treatment Systems. *J. Environmental Engineering* **11**, 1447-1458.
- Rauch-Williams, T., Hoppe-Jones, C., and Drewes, J.E. (2010). The Role of Organic Matter in the Removal of Emerging Trace Organic Contaminants during Managed Aquifer Recharge. *Water Research* **44**, 449-460.

- Hoppe-Jones, C., Oldham, G., and Drewes, J.E. (2010). Attenuation of Total Organic Carbon and Unregulated Trace Organic Chemicals in U.S. Riverbank Filtration Systems. *Water Research* **44**, 4643-4659.
- Laws, B., Dickenson, E., Johnson, T., Snyder, S., Drewes, J.E. (2011). Attenuation of Contaminants of Emerging Concern during Surface Spreading Aquifer Recharge. *Sci. Total Environment* **409**, 1087-1094.
- Li, D., Sharp, J.O., Saikaly, P.E., Ali, S., Alidina, M., Alarawi, M., Keller, S., Hoppe-Jones, C., Drewes, J.E. (2012). Dissolved Organic Carbon Influences Microbial Community Composition and Diversity in Geographically Distinct Managed Aquifer Recharge Systems. *Applied and Environmental Microbiology* **78**(19): 6819-6828.
- Li, D., Alidina, M., Ouf, M., Sharp, J.O., Saikaly, P., Drewes, J.E. (2013). Microbial community evolution during simulated managed aquifer recharge in response to different biodegradable dissolved organic carbon (BDOC) concentrations. *Water Research* **47**, 2421-2430.
- Regnery, J., Lee, J., Kitanidis, P., Illangasekare, T., Sharp, J.O., Drewes, J.E. (2013). Integration of Managed Aquifer Recharge for Impaired Water Sources in Urban Settings – Overcoming Current Limitations and Engineering Challenges. *Environmental Engineering Science* **30**(8), 409-420.
- Koch, K. and Drewes, J.E. (2014). Alternative approach to estimate the hydrolysis rate constant of particulate material from batch data. *Applied Energy* **120**, 11-15.
- Alidina, M., Hoppe-Jones, C., Yoon, M., Hamadeh, A., Li, D., Drewes, J.E. (2014). The occurrence of emerging trace organic chemicals in wastewater effluents in Saudi Arabia. *Science of the Total Environment* **478**, 152-162.
- Alidina, M., Li, D., Drewes, J.E. (2014). Investigating the Role for Adaptation of the Microbial Community to Transform Trace Organic Chemicals during Managed Aquifer Recharge. *Water Research* **56**, 172-180.
- Li, D., Alidina, M., Drewes, J.E. (2014). Role of Primary Substrate Composition on Microbial Community Structure and Function and Trace Organic Chemical Attenuation in Managed Aquifer Recharge Systems. *Applied Microbiology and Biotechnology* **98**(10):4347-53.
- Alidina, M., Li, D., Ouf, M., Drewes, J.E. (2014). Role of primary substrate composition and concentration on attenuation of trace organic chemicals in managed aquifer recharge systems. *J. Environmental Management* **144**, 58-66.
- Dahm, K.G., Guerra, K., Munakata-Marr, J., Drewes, J.E. (2014). Trends in water quality variability for coalbed methane produced water. *Journal of Cleaner Production* **84**, 840-848.
- Parsekian, A.D., Regnery, J., Wing, A., Knight, R., Drewes, J.E. (2014). Geophysical and hydrochemical identification of flow paths with implications for water quality at an artificial recharge and recovery site. *Groundwater Monitoring and Remediation* **34**(3), 105-116.
- Betancourt, W.Q., Kitajima, M., Wing, A.D., Regnery, J., Drewes, J.E., Pepper, I.L., Gerba, C.P. (2014). Assessment of Virus Removal by Managed Aquifer Recharge at Three Full-scale Operations. *J. Environmental Science and Health, Part A* **49**, 1685-1692.
- Fujioka, T., Tu, K., Khan, S., McDonald, J., Roux, A., Poussade, Y., Drewes, J.E., Nghiem, L. (2014). Rejection of small solutes by reverse osmosis membranes for water reuse applications: A pilot-scale study. *Desalination* **350**, 28-34.
- Koch, K., Helmreich, B., Drewes, J.E. (2015). Co-digestion of food waste in municipal wastewater treatment plants: Effect of different mixtures on methane yield and hydrolysis rate constant. *Applied Energy* **137**, 250-255.
- Vuono, D., Benecke, J., Henkel, J., Navidi, W., Cath, T., Munakata-Marr, J., Spear, J., Drewes, J.E. (2015). The activated sludge metacommunity is functionally resilient despite the incomplete recovery of bacterial diversity. *ISME Journal* **9**, 425-435.
- Alidina, M., Shewchuk, J., Drewes, J.E. (2015). Effect of Temperature on Removal of Trace Organic Chemicals in Managed Aquifer Recharge Systems. *Chemosphere* **122**, 23-31.
- Regnery, J., Barringer, J., Wing, A.D., Hoppe-Jones, C., Teerlink, T., Drewes, J.E. (2015). Start-up performance of a full-scale riverbank filtration site regarding removal of DOC, nutrients, and trace organic chemicals. *Chemosphere* **127**, 136-142.
- Chaudhry, R., Nelson, K., Drewes, J.E. (2015). Mechanisms of Pathogenic Virus Removal In A Full-Scale Membrane Bioreactor. *Environmental Science and Technology*. **49**(5), 2815-2822.
- Drewes, J.E. and Khan, S. (2015). Contemporary Design, Operation and Monitoring of Potable Reuse Systems. *J. Water Reuse and Desalination* **5**(1), 2-7.
- Koch, K., Bajón Fernández, Y., Drewes, J.E. (2015). Influence of headspace flushing on methane production in biochemical methane potential (BMP) tests. *Bioresource Technology* **186**, 173-178.
- Regnery, J., A. D. Wing, M. Alidina, J.E. Drewes (2015). Biotransformation of trace organic chemical attenuation during groundwater recharge: How useful are first-order rate constants? *J. Contaminant Hydrology* **17**, 65-75.
- Oladoja, N., Drewes, J.E., Helmreich, B. (2015). Assessment of fixed bed of aluminum infused diatomaceous earth as appropriate technology for groundwater defluoridation. *Separation and Purification Technology* **153**, 108-117.
- Burkhardt, T., Letzel, T., Drewes, J.E., Grassmann, J. (2015). Comprehensive assessment of Cytochrome P450 reactions: a multiplex approach using real-time ESI-MS. *Biochimica et Biophysica Acta (BBA) - General Subjects* **1850**(12), 2573-2581.
- Huber, M., Drewes, J.E., Helmreich, B. (2015). Schwermetalle in Metaldachabflüssen und Möglichkeiten zur dezentralen Behandlung. *Gwf-Wasser/Abwasser* **156**(12), 1238-1245.
- Hübner, U., Kuhnt, S., Jekel, M., Drewes, J.E. (2016). Fate of bulk organic carbon and bromate during indirect water reuse involving ozone and subsequent aquifer recharge. *Journal of Water Reuse and Desalination* **6**(3), 413-420.
- Vuono, D., Munakata-Marr, J., Spear, J., Drewes, J.E. (2016). Disturbance opens recruitment sites for bacterial colonization. *Environmental Microbiology* **18**(1), 87-99.
- Oladoja, N., Liu, Y., Drewes, J.E., Helmreich, B. (2016). Preparation and characterization of a reactive filter for groundwater defluoridation. *Chemical Engineering Journal* **283**, 1154-1167.
- Trinh, T., Branch, A., Le-Clech, P., Hambly, A.C., Carvajal, G., Coleman, H.M., Stuetz, R.M., Drewes, J.E., Khan, S.J. (2016). Hazardous events in membrane bioreactors – Part 1: Impacts on key operational and bulk water quality parameters. *J. Membrane Science* **497**, 494-503.
- Trinh, T., Branch, A., Le-Clech, P., Hambly, A.C., Carvajal, G., Coleman, H.M., Stuetz, R.M., Drewes, J.E., Khan, S.J. (2016). Hazardous events in membrane bioreactors (MBRs) - Part 2: Impacts on removal of trace organic chemical contaminants. *Journal of Membrane Science* **497**, 504-513.
- Branch, A., Trang T.; Carvajal, G.; Leslie, G.; Coleman, H.M.; Stuetz, R.; Drewes, J.E.; Khan, S.; Le-Clech, P. (2016). Hazardous events in membrane bioreactors (MBRs) - Part 3: Impacts on microorganism log removal efficiencies. *J. Membrane Science* **497**, 514-523.
- Li, D., Sharp, J., Drewes, J.E. (2016). Influence of Wastewater Discharge on the Metabolic Potential of the Microbial Community in River

- Sediments. *Microbial Ecology* **71**(1), 78-86.
- Stahlschmidt, M., Regnery, J., Campbell, A., Drewes, J.E. (2016). Application of 3D-fluorescence/PARAFAC to monitor the performance of managed aquifer recharge facilities. *J. Water Reuse and Desalination* **6**(2), 249-263.
- Koch, K., Plabst, M., Schmidt, A., Helmreich, B., Drewes, J.E. (2016). Co-digestion of food waste in wastewater treatment plants: Comparison of batch tests and full-scale Experiences. *Waste Management* **47**, 28-33.
- Trinh, T., van den Akker, B., Coleman, H.M., Stuetz, R.M., Drewes, J.E., Le-Clech, P., Khan, S.J. (2016). Seasonal variations in fate and removal of trace organic chemical contaminants while operating a full-scale package membrane bioreactor. *Science of the Total Environment* **550**, 176-183.
- Maruya, K., Dodder, N.G., Lyons, J., Smith, D.J., Heil, A., Drewes, J.E. (2016). Multi-media screening of contaminants of emerging concern (CECs) in coastal urban watersheds in southern California (USA). *Environmental Toxicology and Chemistry* **35**, 8, 1986-1994.
- Koch, K., Huber, B., Bajón Fernández, Y., Drewes, J.E. (2016). Influence of CO₂ content in the headspace gas on methane production in Biochemical Methane Potential (BMP) tests. *Waste Management* **49**, 36-39.
- Drewes, J.E., Horstmeyer, N. (2016). Strategien und Potenziale zur Energieoptimierung bei der Wasserwiederverwendung. *Österr Wasser- und Abfallw.* **68**, 99-107.
- Regnery, J., Wing, A., Kautz, J., Drewes, J.E. (2016). Introducing sequential managed aquifer recharge technology (SMART) - From laboratory to full-scale application. *Chemosphere* **154**, 8-16.
- Horstmeyer, N., Huber, M., Drewes, J.E., Helmreich, B. (2016). Evaluation of site-specific factors influencing heavy metal contents in the topsoil of vegetated infiltration swales. *Science of the Total Environment* **560-561**, 19-28.
- Huber, M., Welker, A., Dierschke, M., Drewes, J.E., Helmreich, B. (2016). A Novel Test Method to Determine the Filter Material Service Life of Decentralized Systems Treating Runoff from Traffic Areas. *Journal of Environmental Management* **179**(9), 66-75.
- Huber, B., Hilbig, H., Mago, M., Drewes, J.E., Müller, E. (2016). Comparative analysis of biogenic and chemical sulfuric acid attack on hardened cement paste using Laserablation-ICP-MS. *Cement and Concrete Research* **87**:14-21.
- Vuono, D., Regnery, J., Holloway, R., Li, D., Jones, Z.L., Drewes, J.E. (2016). rRNA gene expression of abundant and rare activated sludge microorganisms and growth-rate induced micropollutant removal. *Environmental Science and Technology* **50**(12), 6299-6309.
- Huber, M., Hilbig, H., Badenberger, S.C., Fassnacht, J., Drewes, J.E., Helmreich, B. (2016). Heavy metal removal mechanisms of sorptive filter materials for road runoff treatment and remobilization under de-icing salt applications. *Water Research* **102** (10), 453-463.
- Huber, B., Herzog, B., Drewes, J.E., Koch, K., and Müller, E. (2016). Characterization of Microbial Communities related to Biogenic Sulfuric Acid Corrosion Potential within Full-Scale Digesters. *BMC Microbiology* **16**, 153.
- Leix, C., Drewes, J.E., Koch, K. (2016). The role of residual quantities of suspended sludge on nitrogen removal efficiency in a deammonifying moving bed biofilm reactor. *Bioresources Technology* **219**, 212-218.
- Rajab, M., Heim, C., Letzel, T., Drewes, J.E., Helmreich, B. (2016). Electrochemical oxidation of Bisphenol A by a boron-doped diamond electrode in different water matrices: Transformation products and evaluation of inorganic by-products. *Int. J. Environ. Sci. Technol.* **13**, 2539-2548.
- Leix, C., Hartl, R., Zeh, C., Beer, F., Drewes, J.E., Koch, K. (2016). Performance and N₂O formation of the deammonification process by suspended sludge and biofilm systems – A pilot-scale study. *Water* **8**, 578.
- Oladoja, N.A., Siefert, M.L., Drewes, J.E., Helmreich, B. (2017). Influence of organic load on the defluoridation efficiency of nano-magnesium oxide in groundwater. *Separation and Purification Technology* **174**, 3, 116-125.
- Weissbach, M., Criddle, C., Drewes, J.E., Koch, K. (2017). A proposed nomenclature for biological processes that remove nitrogen. *Environmental Science Water Research & Technology*. **3**(1), 10-17.
- Zhu, B., Bradford, L., Huang, S., Szalay, A., Weissbach, M., Leix, C., Tancsics, A., Drewes, J.E., and Lueders, T. (2017). Unexpected diversity and high abundance of putative nitric oxide dismutase (Nod) genes in contaminated aquifers and wastewater treatment systems. *Appl. Environmental Microbiology* **83**, 4.
- Muntau, M., Schulz, M., Jewell, K., Hermes, N., Hübner, U., Ternes, T., Drewes, J.E. (2017). Evaluation of the short-term fate and transport of chemicals of emerging concern during soil-aquifer treatment using select transformation products as intrinsic redox-sensitive tracers. *Science of the Total Environment* **583**, 10-18.
- Nghiem, L., Koch, K., Bolzonella, D., Drewes, J.E. (2017). Full scale co-digestion of wastewater sludge and food waste: bottlenecks and possibilities. *Renewable and Sustainable Energy Reviews* **72**, 354-362.
- Huber, B., Hilbig, H., Drewes, J.E., Müller, E. (2017). Evaluation of concrete corrosion after short- and long-term exposure to chemically and microbially generated sulfuric acid. *Cement and Concrete Research* **94**, 36-48.
- Ansari, A., Hai, F., Drewes, J.E., Price, W., Nghiem, L. (2017). Forward osmosis as a platform for resource recovery from municipal wastewater. *Journal Membrane Science* **529**, 195-206.
- Stadlmair, L.F., Letzel, T., Drewes, J.E., Graßmann, J. (2017). Mass spectrometry based *in vitro* assay investigation on the transformation of pharmaceutical compounds by oxidative enzymes. *Chemosphere* **174**, 466-477.
- Koch, K., Lippert, T., Hauck, N., Drewes, J.E. (2017). Tube reactors as a novel ultrasonication system for trouble-free treatment of sludges. *Ultrasonics Sonochemistry* **37**, 464-470.
- Thaler, K., Berger, C., Leix, C., Drewes, J.E., Niessner, R., Haisch, C. (2017). Photoacoustic Spectroscopy for the Quantification of N₂O in the Off-Gas of Wastewater Treatment Plants. *Analytical Chemistry* **89** (6), 3795-3801.
- Hellauer, K., Mergel, D., Ruhl, A., Filter, J., Hübner, U., Jekel, M., Drewes, J.E. (2017). Advancing sequential managed aquifer recharge technology (SMART) using different intermediate oxidation processes. *Water* **9**, 221.
- Regnery, J., Lee, J., Drumheller, Z.W., Drewes, J.E., Illangasekare, T., Kitanidis, P., McCray, J., Smits, K. (2017). Trace organic chemical attenuation during managed aquifer recharge: Insights from a variably saturated 2D tank experiment. *J. Hydrology* **548**, 641-651.
- Leix, C., Drewes, J.E., Ye, L., Koch, K. (2017). Strategies for enhanced deammonification performance and reduced nitrous oxide emissions. *Bioresource Technology* **236** (7), 174-185.
- Koch, K., Lippert, T., Drewes, J.E. (2017). The role of inoculum's origin on the methane yield of different substrates in Biochemical Methane Potential (BMP) tests. *Bioresource Technology* **243**, 457-463.
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- Hellauer, K., Karakurt, S., Sperlic, A., Burke, V., Massmann, G., Hübner, U., Drewes, J.E. (2017). Implementation of Sequential Managed Aquifer Recharge Technology (SMART) in Berlin for Enhanced Removal of Trace Organic Chemicals of Concern. *J. Hydrology (in press)*.
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- Bandelin, J., Lippert, T., Drewes, J.E., Koch, K. (2018). Improving the efficiency of sludge pre-treatment by a novel ultrasonic flat-bed reactor system. *Ultrasonics Sonochemistry* **42**, 672-678.
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