

OMAR AL-REHAILI

Ph.D - Environmental Engineering - Riyadh, Saudi Arabia

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PROFILE

An environmental engineer with over 10 years of experience in water and wastewater treatment research, water quality analysis, wastewater reuse, desalination technologies, solid waste management, environmental compliance and sustainability, and community education and outreach.

EDUCATION

Ph.D. in Environmental Engineering

August 2021

Arizona State University, Tempe AZ, USA

Dissertation: System Level and Microfluidic Devices to Lower Energy Requires For Selective Desalination

M.S. in Civil and Environmental Engineering

May 2016

Colorado State University, Fort Collins CO, USA

B.S. in Civil Engineering

June 2011

King Saud University. Riyadh, Saudi Arabia.

PROFESSIONAL EXPERIENCE

Assistant Professor, Civil Engineering Department, King Saud University, Riyadh KSA

2021- Present

- **Teaching:** Water and wastewater treatment, wastewater reuse, physical and chemical treatment processes in environmental engineering, engineering projects management, and environmental assessment.
- **Research:** Advances in water treatment membranes (RO, MD), brine treatment and zero liquid discharge (ZLD), reclaimed water quality analysis for reuse, solid waste management, electrochemical treatment, selective removal of contaminants of emerging concern (CECs), social/economic studies in wastewater reuse, and microfluidics for water treatment.
- **Consultation:** Assist in water quality analysis, prepare water quality reports, provide consultation in water and wastewater treatment processes, wastewater reuse assessment, advanced treatment technologies, waste disposal solutions, environmental compliance, and environmental assessment and auditing.

Scientific Researcher, Nanotechnology Enabled Water Treatment (NEWT), Tempe AZ, USA

2017- 2021

- Developing water membranes processes for water desalination, reclamation and brine treatment.
- Enabling nanotechnology for water membranes to improve mass transfer and fouling resistance.
- Investigating electrochemical water treatment for selective ion removal at macro and micro scales.
- Fabricating of nano/microfluidic devices for water treatment applications using microelectromechanical systems (MEMS) and lithography techniques in a Cleanroom.
- Working with local drinking and wastewater reclamation facilities in Arizona to improve water quality and decrease waste production.

Environmental Engineer, FKEC Environmental Engineering Consultants, Riyadh, KSA

2011-2012

- Participated in the design and construction supervision of the tertiary treatment phase at Manfouha STP.
- Worked on a sewer system project with thrust boring technique on Sheikh Jaber Road.

Civil Engineer, Er. Khaled Alruhaily Office for Engineering Consultation, Riyadh, KSA

2010- 2011

- Actively participated in construction projects involving design and supervision of mid-sized projects.
- Worked as a member of compliance team to ensure the delivery of tasks and minimizing wasting of resources.



ACADEMIC PROJECTS

- **Ceramic Media in Drinking Water Filtration, Fort Collins, USA & Buraydah, KSA** **2016**
Technical and cost evaluation of ceramic membranes for drinking water treatment at two facilities: Parker Water and Sanitation District, Colorado, USA and Water Treatment Plant in Buraidah, Saudi Arabia.
- **Generating Energy from Landfills and Food Wastes, Colorado State University, USA** **2015**
Comprehensive analysis of generating energy from gas emissions at a landfill and from an anaerobic digester of organic wastes in the city of Fort Collins
- **Redesigning of Baysh Dam, King Saud University, KSA** **2011**
Rainfall data collection in the southern regions of Saudi Arabia and redesigning of Baysh Dam.

EDUCATION AND OUTREACH

- **NSF-ERC Outreach for K-12 Students and Teachers, Arizona State University** **2018-2020**
Volunteered as a member of an education and outreach team for NEWT center to spread awareness about water treatment and reuse, public hygiene, and sanitation for teachers and students in local schools.
- **Nano Environmental Engineering for Teachers (NEET), Arizona State University** **2020**
Mentored K-12 teachers in conducting research and empowering students to involve in project-based engineering activities on the topic of water sustainability using nanotechnology.
- **Solid Waste Recycling, Fort Collins - USA** **2015**
Worked with a group of students on spreading the awareness on the importance of recycling in the community

SELECTED PUBLICATIONS

- **Alrehaili, O.**, Fajardo, A. S., Garcia-Segura, S., & Westerhoff, P. (2023). Microfluidic Flow-By Reactors Minimize Energy Requirements of Electrochemical Water Treatment Without Adding Supporting Electrolytes. Separation and Purification Technology, 123123.
- Rho, H., Im, S. J., **Alrehaili, O.**, Lee, S., Jang, A., Perreault, F., & Westerhoff, P. (2021). Facile Surface Modification of Polyamide Membranes Using UV-Photooxidation Improves Permeability and Reduces Natural Organic Matter Fouling. *Environmental Science & Technology*, 55(10), 6984-6994.
- **Alrehaili, O.**, Perreault, F., Sinha, S., & Westerhoff, P. (2020). Increasing net water recovery of reverse osmosis with membrane distillation using natural thermal differentials between brine and co-located water sources: Impacts at large reclamation facilities. *Water Research*, 184, 116134.
- Atkinson, A. J., Bi, Y., Firth, P., **Alrehaili, O.**, Westerhoff, P., & Holman, Z. C. (2020). Aerosol impaction-driven assembly produces evenly dispersed nanoparticle coating on polymeric water treatment membranes. *Journal of Nanoparticle Research*, 22(5), 1-11.

ANALYTICAL INSTRUMENT AND SKILLS

- Ion Chromatography (Dionex ICS-5000)
- Zeta Potential Meter (ZetaCAD)
- Zeta Potential Analyzer (ZetaPALS)
- Topography Measurements (Attension Theta)
- Spin Coating Techniques (SCS Spin Coater)
- Field Emission Scanning Electron Microscopy (SEM) (Hitachi S-4700)
- Focused Ion Beam (SEM) (Nova 200)
- Photolithography (EVG 620 Aligner)
- Electron Beam Lithography (JEOL JBX-6000 FS/E)
- Thin Film deposition (Edwards2 Thermal Evaporator) & (Lesker #3 E-Beam Evaporator)
- Ultracentrifuge (Optima XPN-100)
- Oxygen Plasma cleaner/UV-Vis Spectrophotometer
- Conductivity meter, pH meter, ultrasonication bath, and prob sonication

TRAINING:

- *ISO 14001:2015 Lead Auditor Training– Environmental Management Systems (EMS)- CQI and IRCA certified.*