

DISTINGUISHED SEMINAR SERIES

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Distributed Resource Recovery From Brewery Wastewater



Paige Novak

*Professor and Joseph
T. and Rose S. Ling
Chair in
Environmental
Engineering in the
Department of Civil,
Environmental, and
Geo- Engineering,
University of
Minnesota*

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*We look forward to
seeing you online.*

ABSTRACT: In our current energy climate, we can no longer afford to think of any stream as merely a waste stream. Wastewater is a potential feedstock of value, containing nutrient- and energy-dense compounds. Without technologies to efficiently extract that value, however, wastewater will remain a waste. Researchers have been working to develop such technologies, including microbial fuel cells and biofuel production from wastewater using algae. We have developed an alternative treatment system that combines encapsulated microorganisms in a two-stage system to treat high strength wastewater while simultaneously generating and collecting both hydrogen and methane for energy. We have studied the effect of the encapsulant properties and operating conditions on performance and have modified a diffusion-reaction model to accurately describe the encapsulation system, enabling easier customization. The effluent from the reactors has also been used to grow mustard greens in a substrate-based soilless greenhouse system, providing a true “zero waste” option for co-located food- and beverage-based industries. Finally, we have scaled the system up to pilot-scale and are currently operating the system at a brewery.

BIO: Paige Novak is a professor and the Joseph T. and Rose S. Ling Chair in Environmental Engineering in the Department of Civil, Environmental, and Geo-Engineering at the University of Minnesota. She also co-directs Minnesota’s Discovery, Research and Innovation Economy (MnDRIVE) Initiative: Advancing Industry, Conserving our Environment. Novak’s area of interest is the biological transformation of hazardous substances in sediment, groundwater, and wastewater, resource recovery, and particularly how engineers can influence these processes. She received her B.S. in Chemical Engineering from The University of Virginia and her M.S. and Ph.D. in Environmental Engineering from The University of Iowa. Novak was an Aldo Leopold Leadership Program Fellow in 2009 and has been the recipient of several awards, including the Sara Evans Woman Scholar/Leader Award (UMN, 2013), the Bill Boyle Educator of the Year Award (Central States Water Environment Association, 2013), the Samuel Arnold Greeley Award (American Society of Civil Engineers, 2011), and the Paul L. Busch Award (The Water Environment Research Foundation, 2007). She was named Fellow of the Water Environment Federation in 2016 and of the Association of Environmental Engineering and Science Professors in 2019. From 2013 to 2019 Novak served on the National Research Council’s Standing Committee on Chemical Demilitarization. She is currently the Editor in Chief of the Royal Society of Chemistry’s journal Environmental Science: Water Research and Technology.