

The L.A. Colding Lecture Series

in Environmental Science and Technology

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Occurrence and Fate of Endocrine Disrupting Compounds and Trace Organic Chemicals in Distributed Wastewater Systems

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Abstract:

Onsite and distributed systems for wastewater treatment and water reclamation (ODS) are a growing component of the water systems infrastructure in the USA and around the world. These systems involve an array of technologies such as bioreactors, soil and wetland systems, biofilters and membrane units, which can be implemented to help minimize water and energy demands and maximize reuse in buildings and developments spanning rural, peri-urban, and urban areas. ODS are commonly designed to treat pollutants such as organic matter, nutrients and pathogenic organisms, but the issues and concerns associated with endocrine disrupting compounds (EDCs) and other trace organic chemicals have more recently been considered and understood. These compounds include surfactant metabolites, metal-chelating agents, antimicrobials, antibiotics, and stimulants and they occur in ODS frequently and at concentrations that can be orders of magnitude higher than concentrations in municipal wastewaters. Transformation and removal of EDCs and other trace organic compounds varies by compound properties and treatment conditions, resulting in effluent concentrations that can be less than, similar to, or for degradation products of trace organic compounds, even greater than influent concentrations. This presentation will provide an overview of the status and future of distributed systems and describe field monitoring and controlled experimental research to characterize the occurrence of EDCs and trace organics in different types of domestic and commercial sources and to quantify their fate in different types of ODS.



Ludvig August Colding was Copenhagen's city engineer in the period 1857-1886 and designed the city's water supply system. He chose to base the supply entirely on groundwater. The system's general layout and many of its details date back to Colding's era. From 1869-1886, Colding was a professor at the Technical University of Denmark. At the age of 26, he discovered the law of conservation of energy, simultaneously with, but independently of Joule.

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