



## **OCACS Environmental Program**

Kennedy/Jenks Consultants  
2355 Main St, Suite 140  
Irvine, CA - 92614

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### **Algae-Based Wastewater Treatment Systems: A conceptual approach to developing a sustainable source of biofuels and clean water**

**Dr. Stephen Lyon**

JohnsonDiversey, Inc, Sturtevant, WI

**Abstract:** Algae-based wastewater treatment systems create an important opportunity to address the need for alternative energy with the need for cost-effective wastewater treatment. The oil content and rapid growth of single celled algae are characteristics favorable for their potential use as a biofuel alternative to petroleum-based diesel without the negative impact of corn-based ethanol production on the global food supply. Lipid production increases with algal depletion of nutrients, a mechanism that favors the concept of batch cultures for wastewater treatment. Treated or partially treated wastewater provides an available, nutrient-rich growth medium. With the growing need to account for all greenhouse gas emissions, utilities throughout the country will be looking for ways to shrink their carbon footprint. Conceptually, small rural conventional wastewater treatment plants could be retrofitted to serve multiple functions that would yield a tertiary effluent fit for water reuse, biodiesel, electricity derived from a co-generation system and capture of the waste gases produced by the co-generation system. The ultimate goal of this system would be to develop an algae-based wastewater treatment system that provides the benefits described above and with an energy consumption level that is less than that of a conventional treatment plant.

**Speaker Bio:** Stephen Lyon, Ph.D. has twenty nine years experience as an environmental scientist. His areas of research include domestic and agricultural wastewater treatment, groundwater recharge, constructed wetlands, surface and stormwater treatment, algae-based biofuels and bioremediation. He has taught at San Diego State University, U.C. Irvine, and currently teaches at the John T. Lyle Center for Regenerative Studies at CalPoly Pomona. He is a senior scientist with JohnsonDiversey, Inc in Sturtevant, Wisconsin. Dr. Lyon completed his undergraduate studies in Oceanography and Limnology at Humboldt State University in California and Uppsala University in Sweden, his MS at San Diego State University where he developed a demonstration scale algae-based wastewater treatment system and his Ph.D. in the Department of Environmental Analysis and Design at the University of California Irvine.

**Reservations:** Limited to first 25 with reservations. E-mail reservations to Ganesh Rajagopalan [[RGanesh@KennedyJenks.com](mailto:RGanesh@KennedyJenks.com)] by 10-20-09.

**Driving directions:** From Interstate 405, exit on Jamboree Road and go NORTH. Turn LEFT on Main St up 2 lights, then RIGHT on Cartwright Rd. and LEFT into the first driveway.