



Dec 2011 SEWER LEAKS
A Publication of Los Angeles Basin Section of the CWEA

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AAEE President Speaks at AAEE/AIDIS/WEF Breakfast in Los Angeles

By Wendy Wert

On October 17, 2011 Brian P. Flynn, P.E., BCEE, president of the American Academy of Environmental Engineers, was the featured speaker at the AAEE/AIDIS/WEF Breakfast in Los Angeles. He discussed details of a successful startup of a large-scale industrial wastewater treatment plant utilizing a powdered activated carbon and the activated sludge process (PACT). Brian explained that PACT combines the use of powdered activated carbon with the activated sludge process. In this process, when the activated carbon is added directly to the aeration tank, biological oxidation and physical adsorption occur simultaneously. The discussion continued with an interesting “lesson learned” scenario that demonstrated the importance of hydraulic design in these processes. Attendees related well to Brian’s description of himself as a young engineer responsible for a system which appeared to lose the entire dose of activated carbon. As it turned out, the activated carbon had settled out of solution and was discovered in a hydraulic dead zone in the base of the reactor.



Attendees at sold out AAEE/AIDIS/WEF Breakfast (lt) Featured Speaker Brian Flynn, P.E., BCEE (rt).

Speaker Flynn continued by describing process advantages associated with the addition of powdered activated carbon, which include: (1) system stability during shock loads, (2) reduction of refractory priority pollutants, (3) color and ammonia removal, and (4) improved sludge settleability. An illustration of the need for color attenuation for the subject industrial waste was provided. He continued by explaining that in industrial waste applications, where nitrification is inhibited by toxic organics, the application of powdered activated carbon may reduce or limit this inhibition.

The solids retention time (SRT), as speaker Flynn explained, is related to the dosage of powdered activated carbon and the mixed liquor-powdered activated carbon suspended solids concentration. The SRT represents the average period of time during which the sludge has remained in the system. SRT is the most critical parameter for activated-sludge design, as SRT affects the treatment process performance, aeration tank volume, sludge production and oxygen requirements. Carbon dosages typically range from 20 to 200 mg/L. With higher SRT values, the organic removal per unit of carbon is enhanced, thereby improving the process efficiency. Reasons cited for this phenomenon include (1) additional biodegradation due to decreased toxicity, (2) degradation of normally nondegradable substances due to increased

exposure time to the biomass through adsorption on the carbon, and (3) replacement of low-molecular-weight compounds with high-molecular-weight compounds, resulting in improved adsorption efficiency and lower toxicity.



Renowned attendee Glen T. Daiqger, Ph.D., P.E., BCEE, NAE contributes to the Q&A discussion

Key control concepts, including the use of adenosine triphosphate (ATP) analyses, optimization of carbon usage, and response to upset, were covered. Speaker Flynn described intracellular ATP as an excellent indicator of microbial activity in industrial environments. ATP is the primary energy-transferring molecule in all living cells. Metabolic processes that produce energy in a cell use ATP to transfer the energy to other cell reactions, which require energy. While alive, cells produce ATP continuously. When processes for ATP production are inhibited, all available ATP is consumed. Without ATP, bacteria become dormant, and unable to maintain cell integrity, eventually die. When cells are killed, their ATP rapidly decreases. Thus, ATP can be used to monitor levels of metabolically active organisms in a liquid or deposit sample. ATP detects both aerobic and anaerobic bacteria. Thus, there is no bias from growth medium composition or conditions. Results are generated on-site in less than one minute. These portable sampling devices with built-in reagents work well for bulk water and surface deposit samples.



AAEE Executive Director Joe Cavarretta (lt), Attendees (ctr), WEF Representative Paul Freedman (rt).

Speaker Flynn provided a brief overview of the Academy. A primary objective of the Academy is to certify environmental engineers in their area of expertise, which include: Air Pollution Control, General Environmental Engineering, Hazardous Waste Management, Industrial Hygiene, Radiation Protection, Solid Waste Management, Water Supply and Wastewater and Sustainability. Board Certification is the next step beyond Professional Engineering licensure. AAEE also offers membership categories that serve all levels from students to senior

managers. To learn more about the organization, benefits of membership, and how to join, please go to AAEE's website at www.aaee.net.

The Environmental Engineering Profession

Speaker Flynn explained that recently many renowned professionals have been engaged in discussions related to the evolving role of the Environmental Engineer. There is consensus within the field that the major achievements within the industry have relied on the contributions of gifted experts from multiple disciplines. For example, in 1919 Civil engineer Abel Wolman and chemist Linn H. Enslow of the Maryland Department of Health in Baltimore developed a rigorous scientific formula for the chlorination of urban water supplies. However, establishing the knowledge was not enough, there is a distinct political and public outreach component to the profession. To illustrate this, Abel Wolman had to overcome strong opposition to convince local governments that adding the correct amounts of otherwise poisonous chemicals to the water supply is beneficial and crucial to the public health. By the 1930's chlorination and filtration of the public water supplies eliminates waterborne diseases such as cholera, typhoid, hepatitis A, and dysentery.



Attendees enjoy networking at the *sold out* AAEE/AIDIS/WEF Breakfast (above).

Not only water professionals believe the advent of basic wastewater collection and treatment in the 20th century resulted in direct benefits to the public health in the United States and other developed countries. For example in 2007, thousands of readers of the prestigious British Medical Journal picked sanitation, or wastewater collection and treatment as the “most important medical advance since 1840.”

An essential component of Certification is the Academy's continuing education requirements. The *sold out* AAEE/AIDIS/WEF Breakfast provided the membership with an enlightened and inspired training opportunity. Through collaborative partnerships with organizations dedicated to environmental, sanitary and health preservation, such as the AAEE, the Inter-American Sanitary and Environmental Engineering Association (AIDIS), and the Water Environment Federation (WEF) the profession, continues its journey toward making universal safe drinking water a reality.

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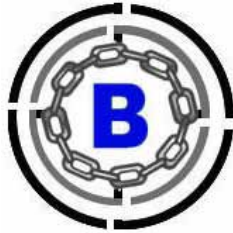
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SPECIAL EVENTS CALENDAR

Dec 8 th	S&YP Holiday Party at Lucky Strike; Downtown Los Angeles, www.labsofcwea.com
Jan 18 th	One-Day Biosolids Workshop; Hyperion, www.labsofcwea.com
Jan 21 st	LABS Awards Banquet; Queen Mary, www.labsofcwea.com
Jan 26 th	CWEA SRC meeting and Advanced Water Purification Demonstration Project Tour; San Diego, www.cwea.org

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