November 2009 SEWER LEAKS – A Los Angeles Basin Section of the CWEA Publication

In This Issue:

Mark your calendar for these dates!

2009 LABS Awards/Nominations for CWEA Awards

Each year LABS, CWEA and WEF present awards to deserving professionals in the water pollution control field. These prestigious awards acknowledge personal achievement and dedication to the profession. Now is the time for you to nominate those deserving individuals with whom you work or associate. Awards are given out at the LABS Annual Awards Banquet in January. The winner in each category is forwarded on to the CWEA to compete at the State level. Nomination forms for the LABS Awards may be found at the LABS website: http://labsofcwea.com/?page_id=822

To register and for more information, visit Please direct nominations and questions to Patrick Griffith at (562) 908-4288, x-2117 or pgriffith@lacsd.org.

You have until November 23rd to submit your nominations!

CWEA Specialty One Day Workshop – Local Limits

Tuesday, November 10, 2009
City of Los Angeles
Industrial Waste Management Division
2714 Media Center Drive
Los Angeles, CA 90065

Whether your agency reviews its own local limits, or hires an outside consultant, this workshop is for anyone working in pretreatment. Because every municipality must review their local limits every five years, this workshop will help you become more aware of the process to make sure you are in compliance. The workshop will refer to the tables, figures, and appendices in the 2004 USEPA Local Limits Development Guidance, especially when working through examples.

Attendees are requested to print and bring a copy of the guidance manual to the workshop. The manual can be downloaded free as a pdf file from: http://www.epa.gov/npdes/pubs/final_local_limits_guidance.pdf

Topics that will be Covered:

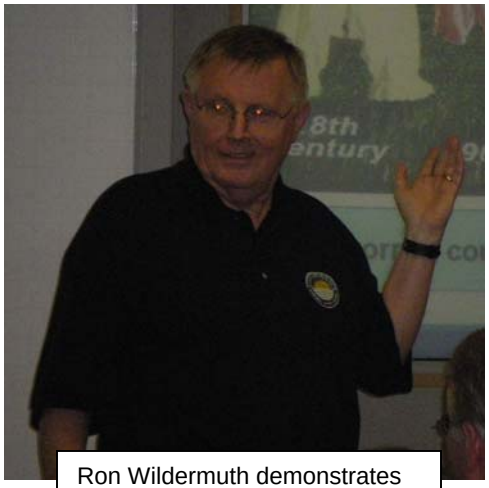
- Introduction to Local Limits
- Establishing Needs and Understanding the Process
- Identifying Pollutants of Concern
- Conducting A Preliminary Analysis
- Safety Factors
- Characterizing Flows & Loads
- Evaluating Allocation Methods
- Calculating Allowable Headworks Loadings
- Developing Control Strategies for Toxic and Conventional Pollutants
- Updating Pretreatment Ordinances

~ Earn up to 6.6 Contact Hours ~

Register Online at www.cwea.org/conferences

2009 Combined LABS and SARBS Dinner & Training Meeting at Edward C. Little Water Recycling Facility **By Matthew Copeland**

Those privileged enough to attend the Combined LABS and SARBS Dinner & Training Meeting at the Edward C. Little Water Recycling Facility on Wednesday, September 9th were treated to an evening they will not soon forget. The tour began with an introductory presentation about West Basin Municipal Water District's (WBMWD) *Water Reliability 2020* program, by guest speaker and WBMWD Public and Government Affairs Manager Ron Wildermuth. Mr. Wildermuth entertained the audience to an audible laughter while informing them of the looming water crisis in LA. Los Angeles is a dry region with an ever-increasing population and shrinking supply of water. Given this scenario, the future of water supply in LA looks bleak: increased water shortages and restrictions coupled with a radical rise in cost appear inevitable. WBMWD recognized these problems facing our region and has developed a proactive approach to alleviate them – *Water Reliability 2020*.



Ron Wildermuth demonstrates global climate trends

The goal of the *Water Reliability 2020* program is to reduce coastal LA's dependence on imported water from 66% to 33% by 2020. WBMWD's plan to achieve this goal with education, doubling the amount water conserved and recycled, and adding 20 MGD of ocean water desalinization. This ambitious program will increase the supply of dependable water, while simultaneously decreasing energy usage with no change in cost per unit water. As part of the plan to double water recycling, the WBMWD built the Edward C. Little Water Recycling Facility (ELWRF).

California's severe drought of the late 80's and early 90's spawned the idea for West Basin to conserve water by recycling. This idea became a reality when through help from state and federal funding the ELWRF opened in 1995, in El Segundo. The facility boasts conservation efforts totaling 30 million gallons of water every day, enough to meet the needs of 60,000 households for a year. Along with being largest treatment facility of its kind in the United States, ELWRF is the only one that produces five different kinds of "designer" water to serve its municipal, commercial, and industrial customers.

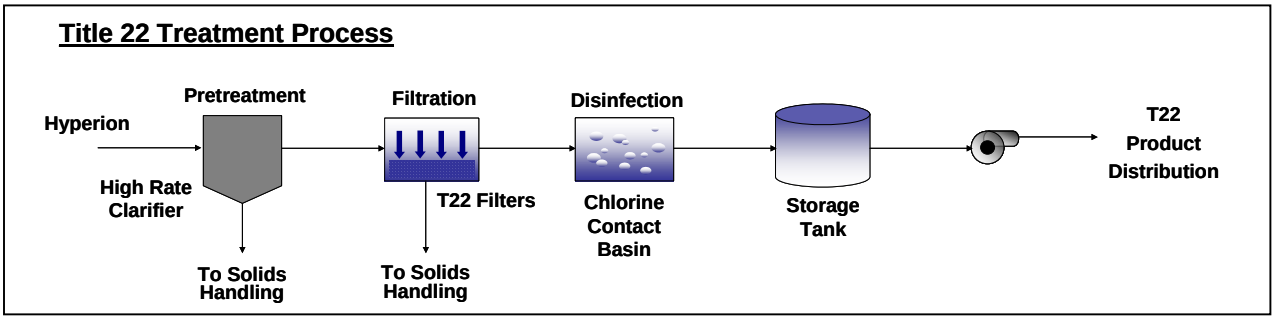
Following Mr. Wildermuth's gripping introduction, the audience split into three groups to tour the facility. Three distinguished stewards of recycled water led the groups: the aforementioned Mr. Wildermuth, Operations Manager Wyatt Won, and the plant Supervising O&M Specialist William E. Brooks. The groups were awestruck as they exited the visitor's center to get their first glimpse of the treatment area. Never before has a sunset looked so surreal as it did that evening shimmering off the stainless steel UV piping. There were row upon row of symmetrical RO modules, the kind that fill a

William Brooks heading one of the three tour groups

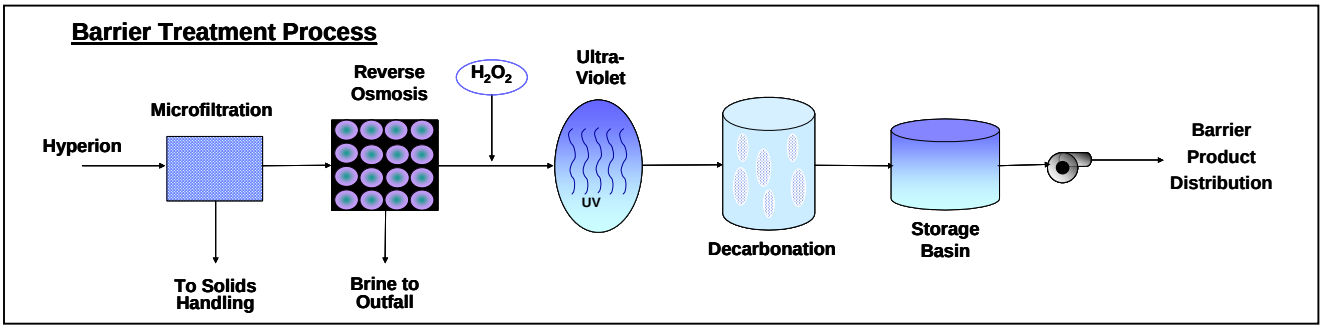
designers dream. Not to mention the pilot-scale test pad that would have any researcher drooling. The treatment plant layout was so impeccable only the most meticulous of engineers could fully appreciate it.

The ELWRF influent water is treated effluent from the Hyperion Wastewater Treatment Plant. With that water the ELWRF produces 40 MGD of Title 22 water, 12.5 MGD of Barrier Product Water, and other various other amounts of water for industrial use. Each of the five types of water produced goes through a slightly different treatment process to produce the water of a desired quality more efficiently.

To produce Title 22 water, the influent first flows through a high rate clarifier and then filters to remove solids. The water then flows through a chlorine contact basin for disinfection. Finally, the water enters a 5 MG storage tank until it is pumped out for use.

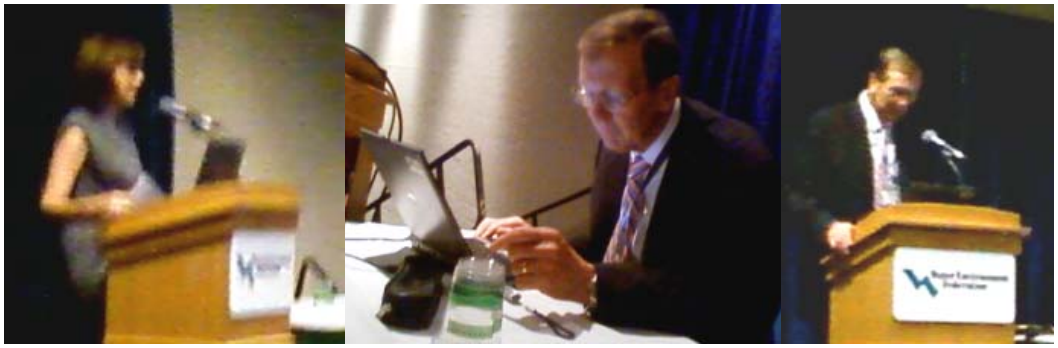


Barrier Product Water is injected into the West Coast Groundwater Basin to prevent saltwater intrusion into the groundwater, which is used for retail use in Southwestern LA. To produce this barrier water the influent goes through a microfiltration process to remove solids. More impurities are removed through reverse osmosis operating at 200 psi. Next, a combination of UV light and peroxide are used to destroy any pathogens left in the water. Then, any carbon dioxide in the water is removed through decarbonation. Finally, the water is sent to a storage tank until it is needed.



The tour concluded with a refreshing sample of Barrier Product Water straight from the tap. The future looks bright for West Basin as they strive to reduce their dependence on imported water. Currently, they are planning to extend the reach of the recycled water system into the Palos Verdes Peninsula and if the Edward C. Little Water Recycling Facility is a harbinger of things to come, the ocean desalinization plant will prove to be a tremendous success.

2009 AAEE WEFTEC Breakfast **By Wendy Wert**



(lt) Debra R. Reinhart, AAEE President;
(ctr) James L. Barnard, AAEE/AIDIS/WEF Speaker;
(rt) James L. Barnard

On October 13, 2009 the American Academy of Environmental Engineers (AAEE) hosted a breakfast and networking event at WEFTEC[09] in Orlando, FL. The AAEE/AIDIS/WEF "Trends in Wastewater Treatment" event drew attendees from a broad spectrum of the environmental profession. AAEE President, Debra R. Reinhart Ph.D., P.E., BCEE, welcomed attendees and introduced the featured speaker, James L. Barnard Ph.D., P.E., BCEE. Dr. Barnard is recognized internationally as "the Father of Biological Nutrient Removal (BNR)." A celebrated 40-year career includes groundbreaking work that forms the basis for all BNR process configurations in use today. His current research on membrane and biofilm technology is leading to innovations that may reduce BNR plant size by more than two-thirds.

Dr. Barnard led environmental professionals on an entertaining historical journey through wastewater treatment. His presentation highlighted the discovery of the activated sludge process, major trends in wastewater treatment, drivers for Research and Development, wastewater as a resource, and possible future scenarios.

Dr. Barnard correlates the beginning of the environmental engineering profession with the 1914 Arden and Lockett publication of *The Activated Sludge Process*. The activated sludge process continued as the, predominate wastewater treatment method into the 1970's. Then the industry predicted the end of the activated sludge process in favor of newly introduced physical/chemical processes. Successful examples of these are tertiary high lime at Lake Tahoe and ammonia stripping at Pretoria. Other types of physical/chemical processes introduced at this time include chemically enhanced primary treatment (CEPT), ion exchange for ammonia removal, recalcination, and granular activated carbon (GAC). These physical/chemical processes continued to gain popularity until 1975.

(lt) Mike Selna, AAEE Vice President;
(ctr) A breakfast attendee;
(rt) Joseph S. Cavarretta, AAEE Executive Director

In 1975 the Goudkoppies plant in Johannesburg, South Africa was completed. This was the first full-scale plant in the world specifically designed for high-rate biological nitrogen removal without the addition of chemicals. With the inclusion of anaerobic zones (1974), the plant achieved 85%

nitrogen removal and 90% phosphorus removal. This triumph marked 60 years of the activated sludge process and renewed the popularity of this process for wastewater treatment applications.

Dr. Barnard then discussed the introduction of fixed growth systems such as moving bed biological reactors (MBBR) and rotating biological contactors (RBC). Denitrification is possible in these systems with the addition of a carbon source such as methanol. Once again Dr. Barnard reported with a smile, that the end of the activated sludge system as the, predominate wastewater treatment technology was forecast.

However, technological advances such as the Integrated Fixed-film Activated Sludge (IFAS) and Membrane Bioreactors (MBR) once again renewed the applicability of the activated sludge process by providing provides for additional biomass within a wastewater treatment facility. Industry practice usually focuses on increasing the bacterial population to meet the system kinetic needs. However, designers often encounter clarifier solids loading limitations that put an upper limit on the amount of biomass that can be carried in the suspended growth system. IFAS systems and MBR's provide physical mechanisms that support additional bacterial populations in the activated sludge process. Once again the activated sludge process has been revived and coupled with technological advances.

Dr. Barnard then discussed the motivation for technological advances within the field of environmental engineering. These include increased stress to natural resources due to population growth, the need to protect water resources from eutrophication, the need to recover energy, the need to recover resources, the need to reduce endocrine disrupting compounds (EDCs), the need to reduce green house gasses (GHG). Most of these are correlated to the primary driver for advancement, which is our need to meet the needs of an increasing global population with limited global resources. Not only has the population expanded but the global culture is changing. For example it is predicted that by 2035 60% of the global population will live in cities. The World Watch Institute estimates that in 2007 greater than 50% of the population is urban.

(lt) Cecil Lue-Hing, AAEE Director;
(ctr) Debra R. Reinhart and James L. Barnard;
(rt) Donald B. Aulenbach

Dr. Barnard then shared an interesting consequence of the stress to the environment. As it turns out, presently the receiving water to the North of Johannesburg is experiencing eutrophication. Ironically, Johannesburg is not using the BNR process that they are famous for pioneering. So how do we as environmental practitioners contribute to the solution of these global issues? Dr. Barnard mentioned the limits of technology (LOT) counterpoint and said that this is a meaningless argument and should not be used. In the absence of limits however, there are some constraints must be considered as we move forward with advanced technological solutions. Viable solutions must be sustainable and economically justifiable. Responsible stewards will conduct least cost analyses (LCA) studies that include components that address the rationality of regulatory targets (N limits of 2.5 mg/L, P limits of 0.01 mg/L) in light of their impact to the receiving water. For example in inland freshwater, it has been well established that phosphorus leads to algal growth. That said, responsible professionals must design systems that use reliable information to protect resources. Unaddressed violations damage waterways and send the wrong message to citizens, developers, and neighboring localities. The example of the Occoquan Reservoir in Virginia was

given. Up to 85% of the flow to the reservoir comes from water purification plants and in 1986, 60% of all streams in the Occoquan Watershed were classified as high quality. Eutrification has impacted the viability of this resource, in an era when the profession is in possession of the knowledge and technology to mitigate these circumstances.

Dr. Barnard introduced the energy discussion by stating that scientific knowledge is sometimes contradictory, which can inhibit action. To illustrate, in 1968 the scientific community was concerned that we were likely to experience global cooling now in 2009, there is concern for global warming. Irrespective of the path forward, it is good practice to design efficient treatment systems. Most of the energy used in wastewater treatment plants (WWTP) is required for nitrification. That said, Dr. Barnard suggested that we look at the energy use at WWTPs in the context of other demands in order to appropriately assess the energy use required to protect resources in the context of other energy demands. For example the BNR process requires 40 kilowatt-hours (KWh) per person per year, whereas, a two person household typically consumes 14,000 KWh per person per year and the energy cost to pump water from northern to southern California is 355 KWh per person per year. The protective resource potential of BNR processes may justify the associated energy requirements.

Attendees enjoy the AAEE/AIDIS/WEF Breakfast at WEFTEC 09 in Orlando, FL.

Dr. Barnard then highlighted future resource recovery opportunities, such as urine separation, energy recovery, nutrient recovery, and water reuse. Urine in wastewater contains 80% of the N and 50% of the P yet makes up only 1% of the overall volume of domestic wastewater. Effective separation of grey water (shower, kitchen), yellow water (urine and flushwater), and brown water (faeces and flushwater) could lead to more efficient design of wastewater treatment trains that allow for focused specific treatment for the constituents of concern. Anaerobic digestion of solids coupled with power generation could reduce the energy usage of these systems. End uses such as composting and struvite retrieval could lead to recovery of both N and P for beneficial reuse. Undeniably the most valuable product of WWTP's is recycled water, which can be used for industrial, agricultural, and even potable applications, such as in Windhoek Namibia where water is precious.

Dr. Barnard concluded by asking if the activated sludge process would be around another 100 years. This is very likely, but with innovations such as MBRs to reduce the footprint, addition of membrane filtration components, coupling with power recovery, nutrient recovery, and water recovery opportunities. One example of technological developments is the use of granular activated sludge in the Anammox (Anaerobic Ammonium Oxidation) process, in Gansbaai South Africa. At this facility influent COD (10,000 ppm) is reduced by 99% (<100 ppm), N (200 ppm) is reduced by 90% (<10 ppm), and dissolved P (25 ppm) is reduced by 96% (<1 ppm). There are currently four full-scale operations.

Los Angeles Basin Section
Dinner & Training Meeting
Proud Bird Restaurant
Thurs, November 19, 2009
mixer-6:00pm dinner-6:30pm

Guest Speaker: Jon Schladweiler
Historian of the Arizona Water Association

Over the past fifteen years, Jon Schladweiler has researched and collected materials related to the history of sewage conveyance systems. He is a valuable source of information about the evolutionary development of sewers over the past 5,500 years.

We hope you'll join us for the November 19 dinner and meeting. Perhaps you'll learn a few things you didn't know about the early development of modern day toilets, sewer systems, and wastewater treatment methods.

- Discover where the earliest evidence of plumbing was found.
- Learn how advances in Roman technology were abandoned in the Middle Ages and what resulted from that infrastructure lack..
- Find out why a gentleman always walked on the street side of a lady (it's not only to protect her from splashes of street mud).

Proud Bird Restaurant
11022 Aviation Blvd.
Los Angeles, CA 90045

Dinner Menu:

Meals include one of the following entrees:

- *Chicken Marsala*
- *Fresh Roasted King Salmon*
- *Pasta da Vinci (vegetarian)*

Reservations:

RSVP By Thursday, Nov. 12

RSVP (with one menu choice from above) to
Pat McDaniel by
Email (preferred method) at
pmcdaniel@biocope.com
or by phone at
(214) 244-8692

Event Cost: (pay at door)

Members: $30
Non-members: $35
Students & Retirees: $15

Handicap Accommodations Available

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Southern CA Rep:	Debra Bogdanoff	(562) 908-4288 x-2734

SPECIAL EVENTS CALENDAR

Nov 10th	CWEA One Day Specialty Conference: Local Limits; Los Angeles, CA; http://www.cwea.org/calendar
Nov 19th	LABS Monthly Dinner Meeting; Proud Bird Restaurant; Pat McDaniel pmcdaniel@biocope.com
Dec 8th	Environmental Sustainability of Water & Wastewater Systems; UC Berkeley Campus; Jennifer Stokes jrstokes@cal.berkeley.edu
Dec 9th	WEF Webcast: Sidestream Treatment for Nutrient Removal and Recovery; 1:00 ~ 2:30pm; www.wef.org/Conferences
March 1st ~ 3rd	CWEA P3S Conference: Navigating Through the Storm - Setting a Course to Clean Water; Long Beach; http://labsofcwea.com/mwd

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