

Sewer Leaks



CELEBRATING BRUCE ZIMMERMAN



The LABS of CWEA is saddened to share the news on Bruce's passing. Bruce quietly passed away after his heroic battle with cancer on February 25th. His professional legacy will be remembered as someone who genuinely cared about the professionals who worked in California's drinking water and wastewater systems. We all will remember Bruce for being one of the few that could make a dirty job in our business sound cool. He could speak at many levels, from the highly skilled field worker to the fresh out of college engineer. Either way Bruce was set out to train and make the people he worked with feel better about themselves and their jobs. Many of you have experienced similar encounters in your own relationships with Bruce. This is what made Bruce a class act. He was a true gentleman and will be sorely missed. May he rest in peace.

BIOTRICKLING FILTERS: A SAFE, INEXPENSIVE METHOD OF REMOVING HYDROGEN SULFIDE FROM ANAEROBIC DIGESTER GAS

by Daniel Gary

At the May 4th LABS dinner meeting Andy Lee of the Los Angeles County Sanitation Districts (Districts) gave a presentation on a biological trickling filter that removes hydrogen sulfide (H_2S) from anaerobic digester gas at the District's largest water resource recovery facility, the Joint Water Pollution Control Plant (JWPCP) in Carson, CA. Mr. Lee explained that during the anaerobic digester process methane (CH_4) and carbon dioxide (CO_2) are generated along with H_2S . Hydrogen sulfide is undesirable because it can be toxic, is corrosive to equipment and, if combusted, generates oxides of sulfur that are an air pollutant. To minimize oxides of sulfur generation the South Coast Air Quality Management District has set a limit of 40 parts per million (ppm) H_2S in digester gas. Typically metal salts, chemical scrubbing and iron sponges have been used to control the concentration of H_2S in digester gas. However, these various methods can be costly and labor intensive. For example, the Districts currently use millions of gallons per year of ferrous chloride to control H_2S levels in digester gas, costing millions of dollars per year. Due to these limitations the Districts developed a biologically based system (the biotrickling filter). The development of the biotrickling filter resulted in the project winning the 2016 California Water Environment Association (CWEA) Research Project of the Year.





The digester gas biotrickling filter development was based on previously built biotrickling filters used to control H_2S emissions from primary treatment air process streams at the JWPCP. The biotrickling filter uses sulfur oxidizing bacteria to oxidize H_2S to various forms of sulfate including sulfuric acid. The sulfur oxidizing bacteria are able to use H_2S as an energy source. To make the biotrickling filter system work, oxygen from air is added along with water and a small amount of nutrients. Use of secondary effluent as the water source provides a source of water and nutrients to the biotrickling filter. All reactions are in the liquid phase, with H_2S being adsorbed into the water before being converted to sulfate.

The first test of the digester gas biotrickling filters was conducted using small pilot units. The pilot units treated a small amount of digester gas from an anaerobic digester. During the testing, different gas flows rates, biological carrier media, air addition rates and H_2S concentrations were tried. The results

show that the test system could handle H_2S concentrations above 700 ppm while maintaining treatment times of less than 30 seconds.

Based upon the results of the pilot testing, a full-scale biotrickling filter was designed to treat digester gas from one of the JWPCP's 3.7 million gallon in capacity digesters. The full-scale unit was constructed to treat 300 cubic feet per minute (cfm) of digester gas with an H_2S concentration as high as 400 ppm, reducing the H_2S concentration to below 40 ppm. The full-scale system was constructed out of acid resistant materials (fiberglass, plastic and stainless steel) in order handle the dilute sulfuric acid that is generated during metabolism of H_2S . Pall rings were used as the biological carrier for the sulfur oxidizing bacteria to minimize any plugging issues.

After the initial start-up of the biotrickling filter, the system was able to consistently achieve 99% removal of H_2S with a minimal of operational problems. The full-scale biotrickling filter has been in operation treating digester gas from one digester for over two years, resulting in annual ferrous chloride addition savings of \$175,000.

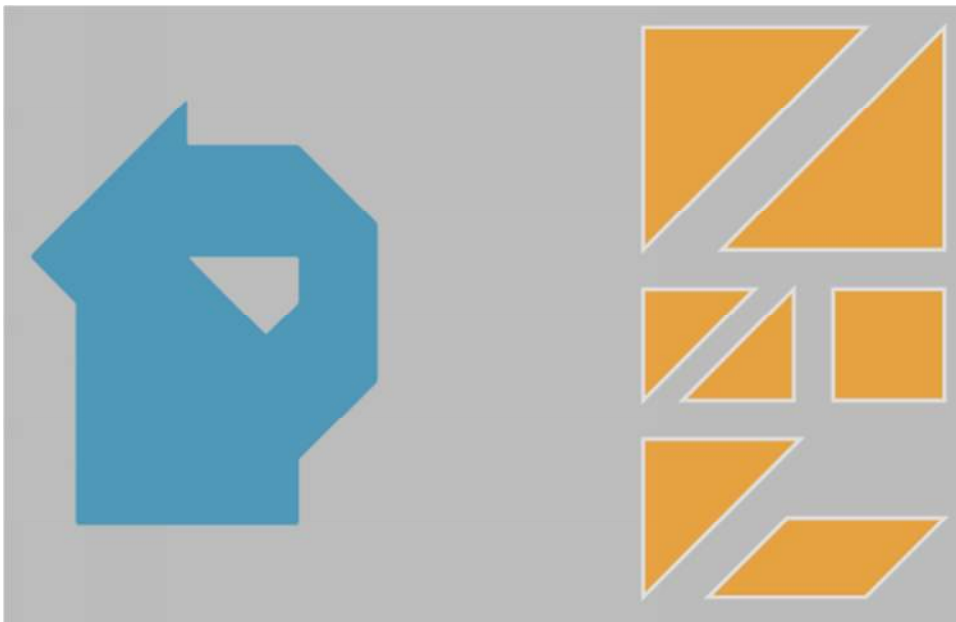
Currently the Districts are designing a larger scale biotrickling filter system that can treat all the gas from one of the JWPCP's two digester gas systems. This system would treat digester gas from five digesters, approximately 1,500 cfm digester gas. Implementation of this system would result in nearly \$1 million in annual ferrous chloride savings and have a payback period of less than 3 years. Ultimately, all JWPCP digester gas could be treated by biotrickling filters to control H_2S , resulting in several million dollars in chemical savings per year.

ANNOUNCING YOUR NEW 2017 to 2018 LABS BOARD MEMBERS

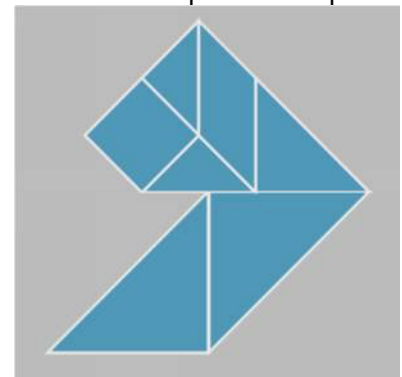


Congratulations to your new 2017 to 2018 LABS Board of Directors! From left to right: Secretary Rachel Deco, President John Robinson, Vice-President Daniel Gary, Treasurer Justin Ibershoff, Director Chris DeMonbrun, Director Dong Liu; Corporate Director Jennifer Thompson, Past President Valerie Ratto, and CWEA Past-President Gary Parker of Encina Wastewater Authority.

SEWER STUMPER



Solution to April's Stumper





The Los Angeles Basin Section of CWEA Dinner Meeting and Presentation June 29, 2017

INSTALLING A LARGE DIAMETER SEWER UNDER CHALLENGING CONDITIONS

Please join LABS to learn about the challenges of installing a large diameter sewer in metropolitan Los Angeles County. Challenges faced were passing under a refinery, live-tie in connections to existing sewers, contaminated soil, tunneling methods and challenges, third party issues and other interesting obstacles.

When: Thursday June 29, 2017
6:00 pm Social Hour
7:00 pm Dinner
7:30 pm Presentation
8:20 pm Questions
8:30 pm End of Presentation

Presenter: Russ Vakharia
LACSD Field Engineering
Senior Engineer

Questions: DanGary1@Verizon.net

Where: Taix French Restaurant
1911 W. Sunset Blvd.
Los Angeles, CA 90026

Dinner Choices: Chicken Marsala, Filet of
Sole or Pasta Monegasque
(vegetarian)

Cost: \$25 Members
\$30 Non-members
\$10 Students or Retires

This presentation is approved
for 0.1 CEU (1 contact hour) of
CWEA Certification credit

RSVP: <https://www.eventbrite.com/e/labs-of-cwea-dinner-meeting-june-29-tunneling-and-sewer-installation-tickets-34511856893>





LABS of CWEA would like to invite you to an
ISLAND LUAU CRUISE

in Marina Del Rey
on Saturday, August 12, 2017
at 11:30 am - 3 pm

Cost: \$50

RSVP: LABSCruise.eventbrite.com

Lunch will be served

Questions? VRatto@OCSD.com

Wear a bright shirt, a grass skirt, or lei,
we're going to celebrate the tropical way!
Don't be late! The Ship can't wait!



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Brian Villacorta, P.E., BCEE Phone: 760-931-0555
2011 Palomar Airport Rd Ste 303 Cell: 925-989-6041
Carlsbad, CA 92011 brian@chcwater.com



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Jennifer Thompson, P.E.
800 Wilshire Blvd. Suite 600
Los Angeles, CA 90017
Phone: 213-312-3314
Fax: 213-312-3399
ThompsonJA@bv.com



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626-912-3391 x205 Main
626-290-9794 Cell
Fax: 626-912-2015
Dhiru.Patel@Lee-Ro.com



www.limno.com

Justin Ibershoff
880 Apollo Street #337
El Segundo, CA 90245

Office: 310-939-7293

jjbershoff@limno.com



John Robinson Consulting, Inc.
A certified SBE

John Robinson, Principal
1055 East Colorado Blvd., Suite 500
Pasadena, CA 91106
(626) 375-9389 cell
jrobinson@johnrobinsonconsulting.com

www.johnrobinsonconsulting.com



Flygt Products

Ricardo Guanio, SR
11161 Harrel Street
Mira Loma, CA 91752
Cell: 562-382-3930
Phone: 951-332-3671
Fax: 951-332-3679
Ricardo.Guanio@xylem.com



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For information on becoming a sponsor of LABS, contact:
Jennifer Thompson: Thompsonja@bv.com



Greg Jaquez
1055 E. Colorado Blvd Ste 500
Pasadena, CA 91106

gjaquez@mnsengineers.com

www.mnsengineers.com

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2400 Broadway
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4452 Oceanview Blvd.
Suite 200
Montrose, CA 91020

Rick Jesmok
Principal

Office 818.330.7425
Fax 818.330.9739
Cell 818.641.4461
Rick@FlowNControl.com
www.FlowNControl.com

Sewer Leaks Editor

c/o Sophia Luu
24501 South Figueroa Street
Carson, CA 90745

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electronic version contact:

labsofcwea@hotmail.com

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Operator	Francisco Ramirez	(310) 648-5857		
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	Jennifer Thompson	(213) 312-3314		
Address Changes			See all our upcoming events at http://LABSofCWEA.eventbrite.com	
Please contact Dan Gary at (310) 830-2400 x5316 or email dgary@lacsrd.org			http://www.labsofcwea.com	