

the clarifier

commit. collaborate. construct.

*Oxidation Ditch – City of Hughson, CA**Slurry Carb Facility, Enertech – Rialto, CA**Anaerobic Digester – Fresno, CA*

The Biosolids Issue

Or should it be the issue of biosolids? The management of biosolids—a euphemism coined to name highly treated sewage sludge—is a major concern for most wastewater treatment facility operators. Historically, most biosolids have been trucked off site and either applied directly to land to serve as fertilizer, or used as alternative daily cover at landfills.

With the encroachment of residential developments on formerly remote properties, more and more local governments are banning the land application of biosolids citing concerns over odors and the potential presence of biological and bio-pharmaceutical contaminants.

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From Waste to Resource

Biosolids are the semi-solid end product of the wastewater treatment process. Solid residue (sewage sludge) is removed from the waste stream and treated either aerobically, such as in an oxidation ditch system similar to the one Filanc is currently building for the City of Hughson California, or anaerobically in a sealed digester, like those we recently finished for the City of Fresno California. Only after completing this treatment step, is the material called a biosolid.

There are two classes of biosolids, A and B. Class B biosolids are treated to remove enough pathogens to allow safe land disposal. Class A biosolids are processed further (pasteurized by heat or composted) to kill pathogens so that the biosolids can be used as fertilizer. Even after digestion, decomposition and dewatering by centrifuging or belt pressing, biosolids still retain a significant percentage of liquid. Water means weight, which controls the cost of shipping for disposal. One alternative is to dry the material further to either reduce weight for shipping, or to create dry pellets for fertilizer or fuel.

In a 2008 presentation to the Bay Area Clean Water Agencies, Carollo Engineers estimated that approximately 75 percent of California's biosolids are land disposed, approximately 16 percent are composted and less than one percent are pelletized as fuel or fertilizer. With the increasing number of counties banning land disposal, there is significant pressure to find a new way to manage 75 percent of the state's biosolids.

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Encina Water Pollution Control Facility – Dryer



Encina Water Pollution Control Facility – Pelletizer

The Biosolids Issue

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Trucking to even more remote locations has a significant cost impact and only continues to transfer the problem.

The issue of biosolids management is globally tied to the presence of concentrated human populations. Wherever there are people there will be biosolids... hopefully not in too close a proximity! Consequently, there continues to be international interest in developing sustainable methods to manage biosolids and to turn them into economically valuable resources. This issue of The Clarifier focuses on the issue of biosolids and how Filanc plays a role in developing the state-of-the-art infrastructure to manage them.

From Waste to Resource

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Filanc recently completed a major renovation of the biosolids management and energy recovery systems for the Encina Wastewater Authority in Carlsbad, California. Functionally obsolete belt presses were replaced with high efficiency centrifuges for dewatering and a complete drying and pelletizing facility, featuring Andritz dryers, was built. Filanc also replaced the existing digester gas burning generators with high-efficiency turbines and associated electrical and switch gear controls. Encina now is currently selling its pelletized biosolids as both fertilizer and fuel for local cement kilns.

Thermal dryers aren't the only way to remove water from biosolids. Filanc worked with HDR DBI, Inc. in designing and building the first of its kind SlurryCarb™ biosolids facility in Rialto, California for Enertech, Inc. The SlurryCarb™ unit exposes biosolids to high temperatures and pressures designed to break cell walls of the biosolids to enhance the dewatering process. The completed Rialto facility also generates dry pellets, or eFuel, that is used by local cement kilns.

It is clear that the issue of biosolids will be with us as long as we are all here. And as scientists and engineers continue apply their talents to the problem and generate new solutions, Filanc will also be here to bring them from concept to reality.



Fuel Cell - Courtesy of Thomas Kranzle & Gills Onions

Getting off the Grid

Anaerobic processing of sewage sludge in digesters not only creates biosolids, it also creates another valuable resource, digester gas rich in methane. For many years, digester gases have been captured, conditioned and combusted in turbines to generate electricity. In recent years, fuel cells have begun to be installed instead because they emit virtually no air pollutants or particulate matter.

Fuel cell electrical generation is also highly efficient and results in lower greenhouse gas emissions compared to combustion-based power resources. In 2011, Filanc will work with UTS BioEnergy, LLC and HDR Engineering to build what will be the largest fuel cell system of its kind in the world for the Inland Empire Utilities Agency (IEUA) in San Bernardino County, California. The fuel cell system will allow IEUA to move closer to its strategic energy plan to go "Gridless by 2020".



Bypass piping – Encina



Influent pipe installation – Encina



Photo: Filanc employee, Patrick Murray, in Kevlar body armor – a requirement for chainsaw use at the Palo Verde Nuclear Generating Station

Nuclear Plant Construction Safety

Filanc Safety Director, **Dave Little**, worked closely with Filanc Arizona Operations Manager, **Robert Butts**, to create a specialized safety training program for the Filanc crew, that would meet and exceed the requirements for the Palo Verde Nuclear Generating Station near Phoenix, AZ. Filanc training included a 10-hour OSHA class, a two-phase training session on chainsaw awareness, and the client's eight-hour safety orientation before starting any work on the Trickleing Filter media replacement project. **Dave**, a certified National Utilities Contractor Association (NUCA) Confined Space Trainer, also taught a Confined Space Entry class at the site.

Encina Influent Sewer Repair

When Filanc's Repair & Maintenance Division (R&M) received a call on October 7th, 2010 regarding an emergency at the Encina Water Pollution Control Facility, there was no hesitation to respond immediately and tackle the project with full force. The 54-inch influent sewer line had partially collapsed and 35 million gallons per day (MGD) of raw sewage had to be captured and diverted downstream of the bar screens to assess the damage. Inspection of the influent line indicated that 330 feet of 54-inch RCP had to be replaced from a manhole outside of the facility to the Inlet Structure. Avenida Encinas was closed to through traffic while the R&M crews assisted Godwin Pumps with the installation of the by-pass pumping that included 23 pumps located at six manholes and 3,000 feet of piping.

While the crews were preparing the site, Filanc Project Manager, **Bruce Cornwell**, worked with the Encina Wastewater Authority and its member agencies including the City of Carlsbad, City of Vista, City of Encinitas, Vallecitos Water District, Buena Sanitation District and the Leucadia Wastewater District, to determine the design and materials that would expedite the project.

The engineers wanted a large diameter pipe that was both chemically resistant to hydrogen sulfide gas, and immediately available for delivery. HOBAS pipe, centrifugally cast, fiberglass-reinforced, polymer mortar pipe, met the criteria and has been used successfully by the City of Carlsbad on multiple projects. The material was ordered and seven truckloads of pipe were delivered to the site two days later.

Despite the challenges of limited site access due to by-pass piping; existing utilities, SDG&E power lines and power poles at the top of an adjacent slope, and impending inclement weather, Filanc crews began a 24-hour operation of removing the existing 54-inch RCP and installing the new 60-inch HOBAS pipe. Seven days later the new pipe was installed, tested, back filled and placed into service. The by-pass pumping operation was removed and the site remediation work began. Six weeks after receiving the call from the Encina Wastewater Authority, the repairs were complete and the site was restored to its original state.



From Left to Right: Mark Filanc, Jack Filanc



The Filanc Family - Courtesy of AGC

2010 Project Wins

Sludge Digester Rehabilitation,
Orange County Sanitation District
(OCS D)

South Bay Advanced Recycled Water
Treatment Facility, Santa Clara Valley
Water District

Camp Pendleton Design-Build
with Associated Operation and
Maintenance for Wastewater
Systems, U.S. Navy Southwest Naval
Facilities Engineering Command

For Clarification:

www.filanc.com

J.R. Filanc Construction Company, Inc.

www.andritz.com

Andritz Thermal Biosolids Dryers

[www.epa.gov/osw/conserve/rrr/
composting/pubs/biosolid.pdf](http://www.epa.gov/osw/conserve/rrr/composting/pubs/biosolid.pdf)

U.S. EPA Biosolids FAQs

[www.cbwm.org/docs/news/Press-
Release-Fuel-Cell-System-oct-2010.pdf](http://www.cbwm.org/docs/news/Press-Release-Fuel-Cell-System-oct-2010.pdf)

Inland Empire Utilities Agency
Fuel Cell Project

www.utsbioenergy.com

UTS Bioenergy

www.enertech.com

Enertech Web Site

www.encinajpa.com

Encina Wastewater Authority

www.agcsd.org

AGC San Diego Chapter

www.ocsd.com

Orange County Sanitation District

www.valleywater.org

Santa Clara Valley Water District

AGC Dedication of Peter Filanc Commemorative Relief at SDSU

Peter Filanc was a visionary and the inspiration behind the formation of the San Diego State University (SDSU) Construction Engineering and Management Program. When Pete was President of the AGC San Diego Chapter in 2002, he led the board in an industry wide effort to initiate this program. His passion for this program was remarkable. He convinced AGC, the industry, San Diego State, and the CSU Regents of the value of a construction engineering and management program at SDSU and personally lead the fundraising to found the program. His enthusiasm was infectious. Universities are notoriously cautious and slow to add new programs. The expectation in 2002 was that this program would probably take 10 to 12 years to become a reality. Pete would not accept that schedule. The program first appeared in the California State University General Catalog in 2007! There are currently over 150 students enrolled in this program.

In memory of Pete, AGC funded a bronze relief that was beautifully sculpted by the 2010 AGC San Diego President, Diane Keltner. The relief will be placed in the SDSU School of Engineering to ensure that Pete's efforts will never be forgotten. The dedication was held on October 15th at SDSU by 2008 AGC President John Daley Jr. and Dr. Ken Walsh, Director of the program. Many people came to honor Pete Filanc on this day including members and staff of AGC San Diego, as well as family and many current SDSU students and program alumni.

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