

SEPTEMBER 2015

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NEXT MEETING

Tuesday, October 13th 11:30am-1:30pm

LOCATION:

Burbank Water and Power 164 W. Magnolia Blvd. Burbank, CA 91503

Lunch sponsored by: City of Burbank

Malibu's Civic Center Way Treatment Plant to Centralize Wastewater Collection and Treatment

Over the past ten years, the City of Malibu, located in northwestern Los Angeles County along the Pacific Coast, has carried out a variety of integrated projects to improve water quality and protect and restore natural resources in the Civic Center/Malibu Lagoon Area. Activities have included construction of vegetated stormwater detention basins, intermittent wetlands, and riparian habitat on 15 acres in Legacy Park along with passive recreation and educational facilities for the community.

RMC Water and Environment served as program manager for the Legacy Park project and was recently contracted by the City to design the next phase of the program, a centralized wastewater collection and treatment project to eliminate on-site wastewater disposal system (aka septic system) loadings to the underlying groundwater basin. The septic system discharges are allegedly contributing to the non-point source loadings of bacteria and nutrients to the adjacent Malibu Creek and Malibu Lagoon, impacting surface water quality and endangered species habitats, and contributing to recreational impairments at Surfrider Beach.







The new Civic Center Way Treatment Facility (CCWTF) will centralize wastewater collection and treatment, and will produce treated effluent that meets wastewater discharge quality standards as outlined in the CCR Title 22 for disinfected

tertiary-treated water. The resultant recycled water will be used for landscape irrigation and other nonpotable uses within the Civic Center Area and surrounding areas to the maximum extent possible.

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Black & Veatch: A Pioneer in Water Reuse

Black & Veatch has been a pioneer and leader in economical, intelligent water reuse. Our work spans across the state of California: planning the Pure Water San Diego Program; planning and program management of the potable reuse program for the City of Escondido, planning support for the initial Groundwater Replenishment System and designing the latest expansion; and design, construction management and commissioning of the Silicon Valley Advanced Water Purification Center. Our water reuse projects range from the reuse of treated water for irrigation, industrial facilities (such as mines, process water and cooling towers), fire protection, and advanced water purification for potable reuse to zero discharge facilities using the latest, most cost-effective and state-of-the-art techniques.We take pride in our record of delivering projects that have over and over again delivered as promised and helped California reduce its reliance on imported water.

Black & Veatch has been involved in the design of more than 700 million gallons per day of water reuse systems since 1998. Some of our more recent projects include:



Groundwater Replenishment System Initial Expansion

The Groundwater Replenishment System (GWRS), a partnership between the Orange County Water District and Orange County Sanitation District, is the world's largest wastewater purification facility of its kind. The facility's success since 2008 allowed for the initial 30 mgd expansion, scheduled to be completed in early summer 2015. The expansion of the project brings the total GWRS capacity to 100 mgd. It produces approximately 103,000 acre-feet of

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President's Column

Don't let the talk of El Niño distract you from fully engaging in recycled water. Although the El Niño is considered one of the strongest on record by experts, they also warn that increased rainfall is not guaranteed. Even with one wet winter, California would still likely be facing a drought until several



above average wet years have a chance to replenish the snow pack, reservoirs, and groundwater basins. We all need to prepare for the worst and hope for the best.

2015 is turning out to be a pivotal year for recycled water. The Governor has taken a strong stance on water conservation and authorized significant funding to expand the safe use of recycled water. To date, the Water Recycling Funding Program (WRFP) has received over 37 construction projects requesting approximately

\$300 million from Proposition 1 to expand recycled water use. The SWRCB announced that it will contributed \$450,000 to support three new WateReuse Research Foundation studies including Potable Reuse Research, Scorecard for Evaluating Opportunities in Industrial Research, and the State of Irrigated Agriculture. There has also been last-minute legislation, SB 163, by Senator Hertzberg declaring wastewater discharges to the ocean a waste and unreasonable use of water and require WWTP's to reuse 50% by 2026. The proposed bill would prohibit ocean discharges by 2036 and require submittal of plans to achieve compliance. The legislation is expected

to carry over until next year for additional consideration unless the Governor convenes a special legislative session to address the drought as requested by the Assembly. WateReuse is working with SWRCB to update the general water recycling permit, revise Title 22 regulations, and expand the safe use of recycled water fill stations. WateReuse is also engaging Caltrans to expand



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Attendees at the August chapter meeting at Malibu.

the use of recycled water on highway medians. Caltrans has reportedly authorized connecting to recycled water trunk lines outside of the right of way in order to expand purple pipe irrigation lines in medians. Resolution of several of these long-standing items this year will help Los Angeles lead California in achieving our recycled water goals.

Please let me know how I can help facilitate the safe expansion of recycled water in your area.

> Raymond Jay, President WateReuse California, Los Angeles Chapter

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Recycled water not used for landscape irrigation will be injected into the underlying Malibu Valley Groundwater Basin for dispersal or percolated into the separate Winter Canyon aquifer.

The CCWTF Project, once constructed, will collect wastewater from an area approximately 2,075 acres in size and convey that influent to a 0.5 million gallons per day (mgd) MBR treatment plant. The collection system will use bottle-tight construction measures such as fused HDPE pipe and manholes with watertight pipe connection boots to prevent brackish water intrusion. Such intrusion must be eliminated as it would increase Total Dissolved Solids (TDS) concentrations to unacceptable levels, thwarting planned irrigation reuse while also increasing the total volume of water to be treated.All pipelines will be underground in public right-of-ways (streets) and in easements. All pump stations will be located below ground, also on public right-of-ways and/or easements. Backup generators and electrical panels will be located partially below ground and will be fenced and screens for security and to minimize visual impacts.

The treatment plant site includes a separate fire system (4-inch and 8-inch) that is fed off the potable water system. A second small-diameter (1-inch and 2-inch) potable water service was also designed for



Treatment facility at build out







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Treatment plant site at 5 year post-construction and 20-year post-construction

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baseline indoor potable water demands. These separated systems avoid water age issues that would be experienced if a combined system were constructed and provides the high levels of system reliability needed for fire service. Recycled water produced at the plant will be distributed within the Civic Center Area via a new distribution system co-located with the wastewater collection system. The three injection wells will tie into the recycled water system and will be constructed on the downgradient edge of the groundwater basin in an area identified as an ancient Malibu Creek streambed channel. Wellhead facilities will be screened above-grade, and the injected water will form a partial barrier to potential future seawater intrusion.

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water per year – enough water for about 850,000 people. For the expansion project, Black & Veatch provided preliminary and final design in addition to construction support.

The GWRS expansion involved the construction of additional treatment facilities for microfiltration (MF), reverse osmosis (RO) and ultraviolet light (UV) at the Advanced Water Purification Facility (AWPF) in Fountain Valley. As part of the expansion, Black & Veatch also upgraded lime post-treatment facilities to enhance treatment reliability and added secondary effluent flow equalization to maximize overall production.

After treatment at the AWPF, the purified water then recharges the Orange County Groundwater Basin – replenishing groundwater supplies with a locally controlled, drought proof source of water. It also protects the basin from degradation due to seawater intrusion.

Sembcorp Changi NEWater Plant

In February 2008, the Singapore Public Utilities Board (PUB) selected a team comprising Sembcorp Utilities Ltd and Black & Veatch to deliver the country's fifth and largest NEWater facility. The 60-million-gallons-per-day Sembcorp Changi NEWater Plant (CNWP), delivered under a design-build-own-operate scheme, was completed in May 2010.

With a focus on minimizing lifecycle costs and maximizing triple-bottom-line results, Black & Veatch designed the new facility, one of the largest water reclamation plants in the world. The feed source for the CNWP is secondary effluent from the Changi Water Reclamation Plant (CWRP), more than 200 mgd activated sludge effluent is processed. The CNWP uses MF, RO and UV disinfection to produce NEWater. It also minimizes land use and conveyance energy and pipework; the CNWP was constructed on the roof of the CWRP.

Taken as part of a holistic approach to water management, CNWP allows "used water," which would otherwise be lost to the sea, to be treated and reused as process water by local industry. NEWater meets up to 30 percent of the nation's current water needs.

Silicon Valley Advanced Water Purification Center

Completed in mid-2014, the Silicon Valley Advanced Water Purification Center (SVAWPC) is the result of a collaborative effort between the Santa Clara Valley Water District and the City of San Jose, California, to produce highly purified water for a sustainable recycled water supply in an area where drought is testing the resilience of water systems.

This project, the largest of its kind in Northern California and first in the San Francisco Bay Area, uses MF, RO and UV disinfection to produce a highly-purified, drought-proof water supply that boosts system resiliency. The final treated product is then blended with an existing recycled water supply produced at the neighboring San Jose-Santa Clara Regional Wastewater Facility to achieve the quality targeted for reuse in the community. It also:

- Enables a shift away from energy intensive imported water supplies.
- Decreases the region's dependence on the Sacramento/San Joaquin Delta.
- Lessens discharges of treated effluent into the San Francisco Bay.

In addition, the expandable 8 mgd SVAWPC is helping to raise awareness and support for advanced processes that render water of such a high quality that it can be used for additional purposes, including future drinking water supplies. Today, recycled water meets about 5 percent of the county's total water demand; by 2025, the SCVWD hopes to double that number. The new SVAWPC is one important step to reaching that goal.

Black & Veatch was the prime consultant for the project, providing design, membrane procurement and construction management support in addition to preparation of the engineer's report, CEQA documentation, and operations support.



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Angeles County, and has been involved with water reuse for 33 years and counting. He ain't getting any younger, so ask your questions before it's too late!



Ask the Guru

Question: "There is a lot of talk about advanced treating recycled water so that it can go directly into the potable water distribution system. If this actually happens, won't the 'purple pipe' direct use recycled water systems become unnecessary?"

- Toilet to Tap

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Dear Toilet to Tap,

First of all, while I'm happy that the "Toilet to Tap" moniker that was originally used to disparage the use of recycled water for indirect potable reuse (IPR) via groundwater recharge is now being enthusiastically used by supporters of direct potable reuse (DPR), it is still inaccurate. It is really toilet to treatment to treatment to treatment... to tap, with liberal doses of hard work, technology and money. But, for the sake of argument, let's not quibble about semantics and bask in the glow of growing public support.

We've been doing planned IPR in the Los Angeles area for over five decades now, so returning highly treated recycled water back into the water supply (albeit through the groundwater aquifer) is not a new idea. But up to now, we've been using time and environmental buffers to separate the recycled water from the drinking water consumers. At the 2015 WateReuse Association national symposium in Seattle, DPR was the hot topic. Advanced treated wastewater, using micro- or nano-filtration, reverse osmosis and advanced oxidation through UV, ozone, hydrogen peroxide or some combination, could be introduced to the head end of a conventional water treatment plant, or perhaps even directly into the potable water distribution system. This could very well become a reality in our very near future.

So, assuming DPR comes to fruition, what happens to the existing (and potential) purple pipe distribution systems that deliver recycled water for irrigation, industrial processes, etc.? Won't these systems become unnecessary and should we then stop investing in them now?

No, purple pipes will still have a place in a post-DPR world. Consider this: we developed our purple pipe systems specifically because we didn't want to use drinking water on golf courses or in industrial

There are plenty of treatment processes and water tests that go into Direct Potable Reuse that make it a far cry from Toilet to Tap!

processes that didn't require such high quality supplies. It doesn't really matter if our high quality drinking water is coming from Sierra snowmelt or from an advanced treatment facility, we still wouldn't want to waste it on grass. The advanced treatment process needed to convert wastewater to drinking water will cost some serious bucks, so why wouldn't we use the existing purple pipe systems that have already been capitalized and amortized to distribute the much lower cost tertiary-treated recycled water for non-potable uses?

You might ask, "How can old and new technology be compatible in this situation?" Well, it's not really unheard of. Horse-drawn wagons shared the road with the new-fangled automobiles for decades. How many of us have VCRs with slots for both DVDs and video-cassette tapes? And how long did Neanderthals and Cro-magnons coexist? (And, no, I was not around for that.) DPR and purple pipe serve two separate, yet complementary, purposes, which means that purple pipe systems will be around even after we start drinking the stuff.



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AECOM

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GOT NEWS?

We're always looking for interesting stories and informational articles to keep our members up to speed on all that's happening in water reuse and reclamation. Email articles or ideas to Matthew Elsner (<u>melsner@ci.burbank.ca.us</u>) or Shelah Riggs (<u>sriggs@dudek.com</u>)

WateReuse Association: www.watereuse.org/sections/california/losangeles

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