WEFTEC14 Relevant Projects

ADVANCED WASTEWATER TREATMENT PLANT BNR PROJECT
Sacramento Regional County Sanitation District (SRCSD) | Sacramento, CA

To comply with new, more stringent effluent discharge limits, SRCSD is replacing existing secondary treatment processes with BNR. Work at this 181 mgd facility makes it one of the largest wastewater projects currently in the works on the West Coast.

BIOKYOWA WASTEWATER TREATMENT PLANT IMPROVEMENTS
BioKyowa, Inc. | Cape Girardeau, MO

This fast-track, design build project was completed in August 2014 and uses advanced membrane technology (MBR) for treatment of high-strength industrial wastewater to improve effluent quality. The DB team delivered this 2 mgd wastewater treatment facility in just 11 months, ensuring that BioKyowa met regulatory performance requirements. The design team expedited Missouri Department of Natural Resources permits and helped our client procure membrane equipment in advance of construction. Overland Contracting Inc., a Black & Veatch company, self-performed a majority of the work, including key electrical tie-ins. The project team overcame poor soil conditions with innovative pile installation that could be installed before design was completed and major onsite work initiated. Carefully planned and coordinated commissioning with the owner and equipment suppliers end to successful on time completion in advance of regulatory deadlines.

BIOSOLIDS MANAGEMENT PROJECT
San Francisco Public Utilities Commission | San Francisco, CA

Black & Veatch is part of a large consultant team engaged in the planning, design and delivery of entirely new biosolids processing and biogas utilization facilities to replace aged infrastructure at SFPUC’s largest WWTP. We are leading the planning for biogas utilization, which will use either internal combustion engine-generators or gas turbine generators to produce steam for heating in the Thermal Hydrolysis Process, while also generating electrical power for export to the SFPUC power grid.
BLUE RIVER WASTEWATER TREATMENT PLANT DISINFECTION
City of Kansas City, MO
New disinfection and dechlorination systems were added to this 400 MLD trickling filter secondary treatment plant. Chemical storage, handling, and feed systems were designed along with the installation of parallel pipeline contactors. The chemical facilities were designed for rail, truck or pipeline delivery of both sodium hypochlorite and sodium bisulfite. Chemical supply proposals were received from several firms and rail delivery of high-strength sodium hypochlorite is under negotiation.

COXWELL BYPASS TUNNEL
City of Toronto, Ontario | Toronto, Ontario
Black & Veatch will perform preliminary design, detailed design and construction administration for this $500 million project, the single largest water infrastructure contract ever awarded in Ontario. Part of a comprehensive, five-phase wet-weather flow system in the Don River Watershed to improve water quality of downtown Toronto waterfront and the Inner Harbour.

DEEP TUNNEL SEWERAGE SYSTEM (DTSS) PHASE 2
Singapore PUB | Singapore
Traversing the western side of Singapore when complete, the project will minimize PUB’s manpower requirements, free up land used by the nation’s current wastewater system, and move Singapore a significant step closer to its goal of water independence. Components include: link tunnel, deep sewer tunnel, water reclamation plant and deep sea outfall. Part of the overall planning will look into the colocation of one of the world’s largest integrated waste management facilities with Tuas WRP. This offers potential synergies of integrating used water and solid waste treatments to maximize energy and resource recovery, including extracting biogas from food waste and directing supply of electivity generated from IWMF to Tuas WRP. The multibillion dollar project, a joint venture with AECOM, is scheduled to be finished by 2022.
ENERGY RECOVERY PROJECTS

Performance Contract to Take Water Reclamation Plant off the Grid

Frederick Winchester Service Authority (FWSA) | Winchester, Virginia

Water is providing engineering-only professional services as part of a design-build team on a $45 million performance contract for energy efficiency and infrastructure improvements at a water reclamation plant in Virginia. We are teamed with Energy Systems Group, which entered into the performance contract with FWSA. The project will nearly take FWSA’s Opequon Water Reclamation Facility off-grid. The new “Green Energy” co-digestion facility receives organic industrial waste streams as well municipal biosolids to produce electricity. It includes anaerobic digestion, waste receiving facilities and 1.2 MW of power generation capacity. In addition, the project includes new aeration blowers and modifications to the aeration system to reduce energy costs and new biosolids dewatering facilities. Estimated first-year savings and new revenue from the total project is $1,700,000. The project is being paid for, without the need for a rate increase, out of the revenue from the high-strength waste and the savings associated with the plant’s power generation and efficiency improvements.

WERF Energy Efficiency and Recovery Study

WERF, Philadelphia Water Department | National

First phase of study included baseline energy flows for common wastewater treatment processes, to identify ways utilities can reduce demand, increase energy efficiency and recover and produce energy on site. See more here and here.

FILTRATE TREATMENT FACILITY – BLUE PLAINS AWTP

DC Water | Washington, D.C.

Black & Veatch is designing a new DEMON™ treatment facility that will treat sludge liquors from a CAMBI process using anammox bacteria. It is the largest DEMON facility in the world and the first treating Cambi liquor. To help DC Water meet regulatory requirements and enhance the impaired Chesapeake Bay, the FTF will remove ammonia-nitrogen from the filtrate sidestream generated by the Final Dewatering Facility. While Blue Plains can treat the additional ammonia loads in the main liquid treatment process, the FTF will be much more efficient, saving approximately $500,000 per month when in full operation.
GROUNDWATER REPLENISHMENT SYSTEM (GWRS) INITIAL EXPANSION

Orange County Water District | Orange Co., CA

Construction on the Black & Veatch-designed 30 MGD expansion is expected to be complete by 2015. Expansion will bring total production of GWRS to 103,000 acre feet per year, enough water for 850,000 people, decreasing dependency on State Water Project and the Colorado River.

MANHATTAN AND BRONX SCREENING AND GRIT CHAMBERS PROJECT

New York City Department of Environmental Protection | New York City, NY

Black & Veatch is providing assessment and design for the replacement of 8 bar screens at the Bronx (369 mgd) and Manhattan (182 mgd) grit chambers, which provide preliminary treatment of CSO flows. CFD modeling was performed to assess channel velocities and grit particle distribution. During design challenges met included tight deadlines and coordination with concurrent construction activities in the screen channel.

NUTRIENT REMOVAL MANAGEMENT PLAN

Sanitary District of Decatur | Decatur, IL

Illinois communities anticipate new rule-making from IEAP to reduce nutrient limits for their NPDES permits in the near future. The Sanitary District of Decatur (SDD) is in a challenging situation as it provides service to two customers that contribute more than 80% of the nutrient load to WWTP. Black & Veatch was retained to help SDD develop a strategy to develop a long-term nutrient reduction strategy. We are: evaluating the Industrial and domestic contribution of the nutrient load; developing BNR options for various potential phosphorus and nitrogen limits that may be imposed by IEPA; creating BioWin models of the existing facilities and several BNR treatment schemes; and looking at options, such as segregation of the plant into an industrial process train and a domestic process train, and/or phosphorus recovery using Ostara-type technology. Our study will conclude with establishing planning level budgets for potential nutrient reduction options.

OSIS AUGMENTATION RELIEF SEWER (OARS) PHASES 1 AND 2

City of Columbus, Division of Sewerage and Drainage | Columbus, OH

This consent decree-driven project is one of the largest, most complex, costly and environmentally important in Columbus' history. Black & Veatch is providing CM services for Phase 1 and 2 of this 4.5-mile tunnel which will include three relief structures to divert wet weather CSO.
PHOSPHORUS RECOVERY AT THE STICKNEY WRP

Metropolitan Water Reclamation District of Chicago (MWRD) | Chicago, IL

MWRD selected Black & Veatch and Ostara Nutrient Recovery Technologies to Design-Build a new nutrient recovery system at its 1,200 mgd Stickney WRP, which is the world’s largest water reclamation facility. By implementing a phosphorus removal and recovery system, the project will meet future effluent nutrient limits to improve water quality in local rivers, lakes and streams. It also will produce commercial fertilizer from recovered resources.

PLEASANT RUN DEEP TUNNEL

Citizens’ Energy Group | Indianapolis, IN

Black & Veatch will update the Advanced Facility Plan and design the largest of six tunnel segments for CEG’s $1.1 billion Dig Indy Tunnel Program. Project includes 6.6 miles of 18-foot-diameter finished tunnel with seven drop shafts and 26,000 feet of 24-inch to 72-inch diameter consolidating sewers.

RECLAIMED WATER USE EVALUATION

Oklahoma City Water Utilities Trust | Oklahoma City, OK

Additional opportunities to utilize reclaimed water to reduce potable water demand in the Oklahoma City metropolitan area were evaluated. Options considered under the study included supplementing the North Canadian River raw water supply system with reclaimed water from three wastewater treatment plants. In addition, the expanded use of reclaimed water from the wastewater treatment plants within the service area for industrial and agricultural uses were also examined.

RO FOR RE-USE: CHANGI II NEWATER PLANT

Singapore Public Utilities Board | Singapore

Black & Veatch completed the Sembcorp Changi NEWater Plant under a DBOO contract in Singapore for the Singapore Public Utilities Board. SembCorp Utilities Ltd appointed Black & Veatch to design the 228,000 m3/day (50 mgd) Changi NEWater Plant (CNWP), one of the largest water reclamation plants in the world. The feed source for CNWP is secondary effluent from the Changi Water Reclamation Plant (CWRP), an 800 ML/d activated sludge wastewater treatment plant. CNWP is constructed on top of the main treatment module of CWRP. The quality of the CWRP effluent is typical of a well-designed and operated activated sludge plant. The project was recently awarded the Water Reuse Project of the Year Award, by the Global Water Intelligence in 2010. In 2013, Black & Veatch was appointed as the owner’s engineer for the next phase of NEWater, with the Changi II Plant.
SILICON VALLEY ADVANCED WATER PURIFICATION CENTER
Santa Clara Valley Water District and City of San Jose, CA | San Jose, CA
The Center treats wastewater that otherwise would be discharged into the San Francisco Bay to produce 8 mgd of purified water for irrigation and industrial applications, saving and potentially expanding the areas precious drinking water supply. Tertiary treatment is provided through microfiltration, reverse osmosis and ultraviolet light. The project was featured in Civil Engineering (May 2014).

TOMAHAWK WWTP EXPANSION
Johnson County Wastewater | Overland Park, KS
Improvements at Tomahawk are needed to meet anticipated nutrient removal limits, and to provide wet weather facilities and treatment capacity to 19 mgd.

THREE RIVERS PROTECTION AND OVERFLOW REDUCTION TUNNEL (3RPORT) FINAL PLANNING AND DESIGN SERVICES
City of Fort Wayne Division of Utilities (Fort Wayne City Utilities) | Fort Wayne, IN
Largest CIP the City has ever undertaken. Project is paramount to the city’s compliance with its 2007 Consent Decree and CSO long-term control plan. Project involves integrated wet weather planning and tunneling design. For 2 years already, we have provided evaluation study, preliminary design and geotechnical investigations on 3Port. The following is a news story about the project.

UPPER YORK SEWAGE SOLUTIONS PROJECT
Regional Municipality of York | Regional Municipality of York, Canada
Black & Veatch is a subconsultant to Conestoga-Rovers & Associates for this $400 million (CAD) project to service growth in York Region, north of Toronto. The project is comprised of three elements: a greenfield water reclamation centre (WRC), twinning of an existing sewage force main, and upgrades to existing stormwater management facilities to achieve phosphorus offsets within the watershed. The WRC is the primary component and includes a four stage Bardenpho biological treatment process followed by low-pressure membranes (microfiltration) and reverse osmosis membranes to meet extremely stringent phosphorus limits. Black & Veatch is responsible for delivering several aspects of the work including four pairs of force mains serving the WRC, the outfall to the river, the advanced treatment component (post-secondary treatment), water reuse aspects of the WRC and some of the stormwater facility upgrades. Commissioning is scheduled for the end of 2018. More info is available here and here.
WWTP ALTERNATIVE LIQUID AND SOLID TREATMENT TECHNOLOGIES EVALUATION STUDY AND DESIGN

Midwest City Municipal Authority | Midwest City, OK

Sweeping updates were needed to comply with discharge regulations and to meet the city’s sustainability goals. Improvements affect every process and structure on the 60-acre plant site, including: Oklahoma’s first Moving Bed Biofilm Reactor (MBBR) with Modified Ludzack-Ettinger for the biological treatment process; influent lift station; fine screening; high-efficiency grit removal; clarifier upgrades; conversion to UV disinfection; introduction of pre-thickening; upgrades to anaerobic digesters; biosolids dewatered with new rotary presses and stabilized to Class A biosolids on site in new state-of-the-art automatic composting facility; comprehensive modern plant controls system; and site-wide medium-voltage power system.