Summit Initiates Municipal Wastewater Energy Efficiency Practice

Senior Project Engineer, Ed Myers, specialized in energy efficiency capital improvements for municipal wastewater facilities prior to joining Summit Engineering, Inc., in 2015. Starting in 2008, Ed partnered with Quantum Energy Services & Technologies, Inc. (QuEST), who administered the California Wastewater Process Optimization Program (CalPOP), a utility sponsored energy efficiency program. Ed studied ten municipal wastewater facilities with CalPOP; over half implemented successful efficiency improvements as a result. The most recent success was with the City of San Leandro, California.

San Leandro discharges treated wastewater to San Francisco Bay. Its wastewater treatment facility (WWTF) serves 55,000 residents and numerous businesses. Its design dry weather flow is 7.6 million gallons per day. When San Leandro engaged CalPOP in 2010, the aeration basins were supplied air with multistage fixed speed blowers only. Ed's CalPOP evaluation found the multistage blowers were energy wasters. Multistage blowers have limited turndown capacity, and when Biochemical Oxygen Demand (BOD) load was at its lowest, San Leandro had to vent (waste) over half its blower air to maintain DO setpoint.

In the past decade, variable speed single stage turbo blowers have been introduced to wastewater treatment facilities. These blowers can turn down their air output to a much greater extent than multistage blowers, and save considerable energy. The CalPOP study proposed replacing one of the multistage blowers with a turbo blower, along with other improvements. The energy modeling predicted $29,600 annual power bill savings from an investment of $195,000. The CalPOP study qualified San Leandro for a zero interest capital cost loan from the electric utility, to be paid back from energy savings.

Ed guided the development of a turbo blower specification, and performed the technical evaluation of blower bids. The specification favored the vendor who could guarantee the lowest life cycle cost; in this way, energy efficiency, and lifetime lower power cost, were given equal weight with initial cost.

The winning turbo blower vendor was ABS-HST, based in Finland. Their blower demonstrated a remarkable 3:1 airflow turndown; 2:1 being typical for turbo blowers. It maintained high efficiency across its entire flow range.

In operation, the 150 HP turbo blower, by itself, has been able to supply all the air needed 99% of the time; before, two 150 HP multistage blowers were often needed for peak air demands. DO control was significantly improved. The CalPOP post-install verification measurements predicted the annual aeration power cost will be cut in half, saving about $60,000 per year, with a 3.6 year simple payback. Based on the predicted savings, San Leandro earned a $48,500 cash incentive from the electric utility.

Summit has partnered with QuEST to help more municipal wastewater treatment facilities find and finance energy efficiency improvements. In addition, Summit is in direct dialogue with municipal facilities to assess energy efficiency improvements that do not qualify for assistance from the CalPOP program. Ed will lead Summit's municipal wastewater energy efficiency projects.