

Dear BACWA member,

AECOM invites your participation to demonstrate Nereda® Aerobic Granular Sludge (AGS) technology in the Bay Area.

Bay Area regulations are expected to impose stringent effluent nitrogen and phosphorus limits in the future. We understand that as a BACWA member you are concerned about the impending cost of meeting stricter nutrient standards in the Bay Area and are collaborating with other agencies to address these challenges.

Conventional nutrient removal requires a considerable expansion of treatment volume. Space at many Bay Area plants is at a premium and conventional retrofits may be prohibitively expensive. Nereda® AGS is an innovative treatment technology that achieves nutrient removal in a small footprint with significant energy savings over conventional activated sludge processes. There are over 30 full scale installations of Nereda® worldwide that have demonstrated meeting nutrient removal performance objectives in sustained full scale operation; however, as of now, there are no installations in the United States.

Aerobic Granular Sludge is an evolution of Conventional Activated Sludge technology (CAS) where microorganisms form large dense granules instead of fluffy flocs. These granules are stratified like an onion, surface-to-core, with layered biomass that enables respective roles of nitrification and denitrification, avoiding dedicated reactor zones and recycle streams.

Granules are formed by enforcing strict feast-famine feeding regimes in Sequencing Batch Reactors (SBRs). This ensures selection of granule promoting phosphate-accumulating organisms (PAOs), removing phosphorus as well as

nitrogen in the process. These dense granules increase reactor capacity by increasing mixed liquor suspended solids (MLSS) concentrations to 6-8000 mg/l, and by achieving rapid settling due to the high granule density and size. *See photo at right, comparing CAS with Nereda®.*



Use of a sequencing batch approach negates the need for a secondary clarifier, further saving space and conserving energy. Nereda® has reportedly been shown to use approximately 30-40% less energy than conventional flow-through CAS, in part due to the absence of recycle pumping for Internal Mixed Liquor Recycle (IMLR) and Return Activated Sludge (RAS), and in part due to improved aeration efficiency.



An important component of a Nereda® demonstration is to show that a typical Bay Area conventional flow-through, continuous CAS process can be cost-effectively adapted/retrofitted to a quasi-SBR (step-wise continuous) process. Such a demonstration in a well-documented study would pave the way for acceptance by Bay area regulators. The study will provide evaluation and design criteria for Bay area participants to evaluate the attractiveness of AGS at their own facility as well as accelerate the adoption of this revolutionary wastewater treatment technology across the U.S.

Fairfield-Suisun Sewer District (FSSD), a fellow BACWA member, has agreed to host a Nereda AGS demonstration at their 12 MGD wastewater treatment facility. AECOM has secured a large scale, modular pilot facility with 21 foot tall reactors for this purpose. *See photo at right.* The pilot will commence by the end of February.



AECOM has submitted a pre-proposal for research funding to Water Research Foundation (WRF) which has been favorably received. WRF provides matching funds up to \$100,000 for innovative technology demonstrations, through subscribing utilities. Our intent is to build a group of supporters that in the aggregate will generate contributions matching the \$100,000 grant from WRF, thereby further leveraging your and other BACWA members' contributions.

As a supporter, you'll have the opportunity to participate in the conducting of the demonstration, receive periodic progress reports, participate in workshops to review findings, and provide input to operations, in order to create relevant findings that will inform your future nutrient removal decisions.

We will be following up with a phone call to answer any questions you may have and explore your agency's potential interest in participating in and supporting the proposed Nereda AGS demonstration. In the meantime, if you have any questions, please don't hesitate to contact one of us at the email addresses or numbers listed below.

Sincerely,

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