Refinery Activated Sludge Process Improvement

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- **Strategic Fit:** Reliable performance of activated sludge treatment is critical to refinery operations. While there have been traditional methods used to diagnose and identify specific, key microorganisms, there is now the capability to use molecular tools to identify and characterize a broad swath of microorganisms, and possibly those that have been missed.

- **Program Goal:** Develop a microbial database of key microorganisms across multiple refinery wastewater facilities.

- **Value Proposition:** In our previous PERF project, A Review of Molecular Biology Tools for Wastewater Treatment for the Oil and Gas Industry, we learned that there was a dearth of research and literature on 'typical' microbial populations in refinery wastewater. Without this information on the normal range of functioning microbial wastewater treatment populations, the ability to use this key tool is limited. Developing microbial indicators that can monitor treatment plant performance and ideally minimize system upsets due to sludge bulking and foaming, loss of nitrification, and ability to weather and recover from toxic upsets will be the value in supporting this project.

- **Brief Program Description and Expected Deliverables:** Libraries of microbial populations will be constructed from at least 3-5 full-scale wastewater treatment plants and bioinformatics and statistics will be applied to characterize the results and then compared to performance parameters.

- **Deliverable(s)**: Summary report of results/ regular teams call updates, library database and statistics

- **Total estimated budget**: Scalable, and to be determined