Optimization of Nitrification in Refinery Wastewater

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- **Strategic Fit:** Ammonia is a critical monitoring parameter for refinery wastewater discharge permits. An upset to the wastewater treatment process that results in the loss of nitrification, or conversion of ammonia to nitrate, might lead to a permit violation so it is paramount to avoid loss of nitrification during wastewater treatment operations and beneficial to optimize it so that the system is more resilient

- **Program Goal:** Reduce and eliminate the loss of nitrification in refinery wastewater

- **Value Proposition:** Nitrification is one of the most critical operations in refinery wastewater treatment and is critical for regulatory compliance, yet optimizing its performance can be improved.

- **Brief Program Description and Expected Deliverables :** This project will use molecular microbial tools to monitor nitrifiers at 3 to 5 refinery wastewater treatment plants that have had a history of nitrification loss. Operating conditions will also be monitored, along with the presence and prevalence of other microbial populations. If it is discovered that key nitrifiers are identified but their activity is not measurable with currently available assays, one task would be to develop a new assay. If other microbes are observed to decline prior to a loss of nitrification, they could be use as early indicators of a potential system upset.

- **Deliverable(s)**: Regular teams meetings to discuss progress and a summary report. The project will yield a baseline understanding of nitrifier populations, a library of microorganisms and a new assay
- **Total estimated budget**: Will depend on number of facilities monitored and length of observation period. The project is very scalable.