



Review of Protein Matrix Pilot Conducted at Incline Village General Improvement District Wastewater Treatment Plant / Sewer Pump Station 1

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Plant Operator III/Chemist

Before I get into the specifics of our pilot study with Protein Matrix, I must be clear: their product eliminates fat, oil and grease (FOG) buildup, so pumping of lift stations and other problematic FOG areas is no longer needed.

Incline Village restaurants, casinos and residential housing contribute high concentrations of FOG to our wastewater treatment plant, requiring frequent maintenance and placing a heavy burden on plant processes. Due to its geometry, one of our older (1960s) lift stations has a tendency to accumulate oil and grease at a very high rate. Despite the use of a barminutor, which shreds physical debris and incoming FOG, frequent preventative maintenance is needed and a complete cleanout of this lift station is required on a quarterly basis. Nearly 60% of the daily flow is handled by this lift station, making it critical to the overall performance of the plant. The station is also located in a high traffic public area near a popular beach, walking path, and park, so extra care is taken to minimize odors and, thus, complaints from the public, especially during the summer.

To combat this FOG problem, we invited Protein Matrix (PM) to pilot test their product in this lift station from 6/19/14 - 9/19/14. When fed into the wastewater stream, this plant-based material reduces fat, oil, and grease accumulation by emulsifying and then converting FOG into a highly flowable byproduct that does not re-accumulate in pipes downstream. This byproduct is also easily digested by WWTP microorganisms and results in a more stable organism population.

The first objective of this pilot was to evaluate the performance of PM and determine if it offers a cost-effective solution to FOG-related maintenance at the lift station and downstream WWTP. Because our plant has a problem with nocardia (gram positive) and M-Parvicella, type 1863 (gram negative), which we associate with high FOG loads, our second objective was to determine if PM would reduce the filamentous organism population and, in turn, enhance settling.

I am one of the wastewater treatment plant operators responsible for introducing Protein Matrix into our lift station in a controlled manner. Before application of PM, one of the basins was half-filled with FOG buildup. We decided to spray PM directly onto the FOG surface, and after about 30 minutes, the oil and grease became very soft and was easily dissipated with a hose. This significantly reduced the accumulated FOG found in the lift station. With the station now clean as a result of PM application, a representative from Protein Matrix worked closely with us to optimize the rate and location of a continuous drip feed of PM into the lift station, in order to



prevent future FOG accumulation. Two weeks after the lift station was cleaned, we began feeding PM into the lift station at a conservative rate of 1 gal per 100,000 gallons of flow.

Throughout the pilot, plant process data was compared with data from 2012 and 2013, and as of today, nearly 6 months since we began feeding PM into the lift station, no changes have been observed in the parameters used to monitor plant performance. We continue to collect data to determine the effect PM has on the microorganism population.

Based on this success, we continue to use PM at the lift station and our FOG compliance team has initiated a pilot project with local restaurants with the goal of reducing/eliminating FOG in the sewer main by introducing PM at the source.

With PM, we no longer need to clean out FOG from the lift station, so the lift station is easier to service and the odor emanating from the plant has been significantly reduced. In addition, our initial results suggest that PM has the potential to cleanout sewer lines. Although it is too early to substantiate, PM should reduce overall wastewater treatment costs from source to effluent into the environment.

A handwritten signature in black ink, appearing to read "M. Murphy", with a large, stylized loop at the end.

Michael Murphy
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