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Frackville Area Municipal Authority WWTF Aerobic Digestion System Case Study

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History and Objectives

Frackville Area Municipal Authority (FAMA) Wastewater Treatment Facility (WWTF) in Frackville, Pennsylvania currently operates an Ovivo Airbeam® Cover aerobic digestion system and was commissioned on October 2010.

FAMA was seeking to upgrade and improve their aerobic digestion system. Entech Engineering was contracted by FAMA to design an improved aerobic digestion system that would reduce the amount of solids to be disposed for land application.

FAMA WWTF Aerobic Digestion System Design

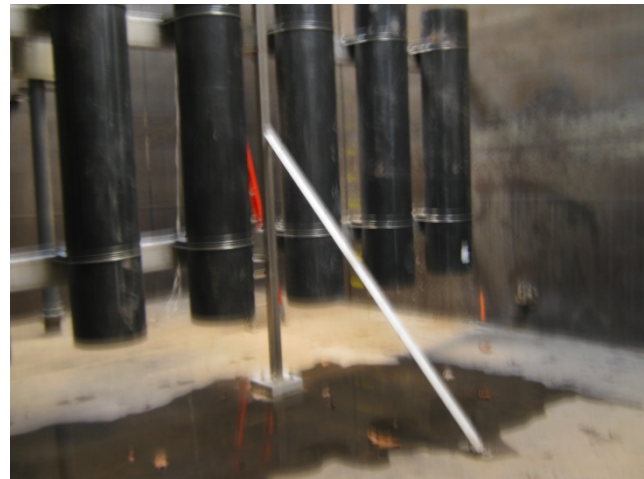
Previously aerobic digestion at the FAMA WWTF was done through a floor mounted coarse bubble diffuser system. Entech Engineering proposed to retrofit the two existing aerobic digestion tanks with an Ovivo Airbeam® Cover aerobic digestion system to minimize operating and capital costs, provide maximum mixing and aeration efficiency of waste activated sludge (WAS) using minimum energy requirements, minimize odors, and provide optimum temperature control to improve digestion of the WAS .

Each aerobic digester tank was designed with an Airbeam® Cover integrating Ovivo's MS® diffusers and shear tubes. The shear tubes allow the diffusers to be submerged several feet above the bottom of the tank floor reducing the blower discharge pressure thus lowering energy requirements of the aerobic digestion operations.

Figure 1: FAMA WWTP Airbeam® Cover Aerobic Digestion System



Airbeam Cover Aerobic Digestion System



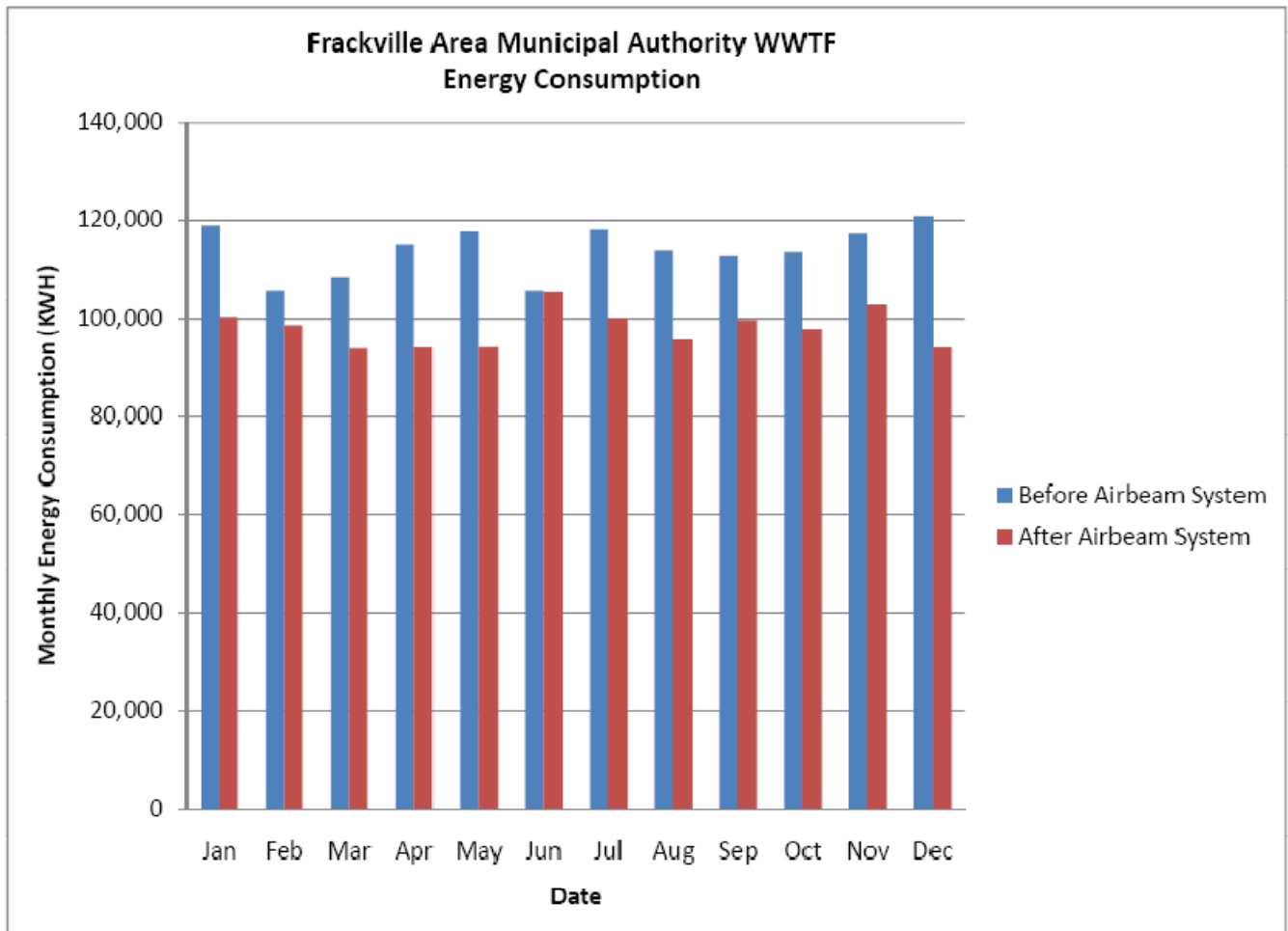
Shear Tube Aeration Equipment Under the Airbeam® Cover

Results of the FAMA WWTF Aerobic Digestion System

Reduced Energy of at the FAMA WWTF

In comparison to the prior floor mounted diffuser system the shear tube design at the FAMA WWTF is capable of lowering the discharge pressure of the blower system by nearly 1.5 psig resulting in more than a 15% reduction of overall energy usage at the WWTF since incorporation of the Airbeam® Cover aerobic digestion system. Figure 2 below shows the reduction in energy as a result of the Airbeam® Cover aerobic digestion system. The reduced energy usage from this system saves FAMA \$18,000 annually in energy costs. Due to this reduction of energy the local electric utility service provider Pennsylvania Power & Light (PPL) will award FAMA a \$27,000 Energy Efficiency Rebate.

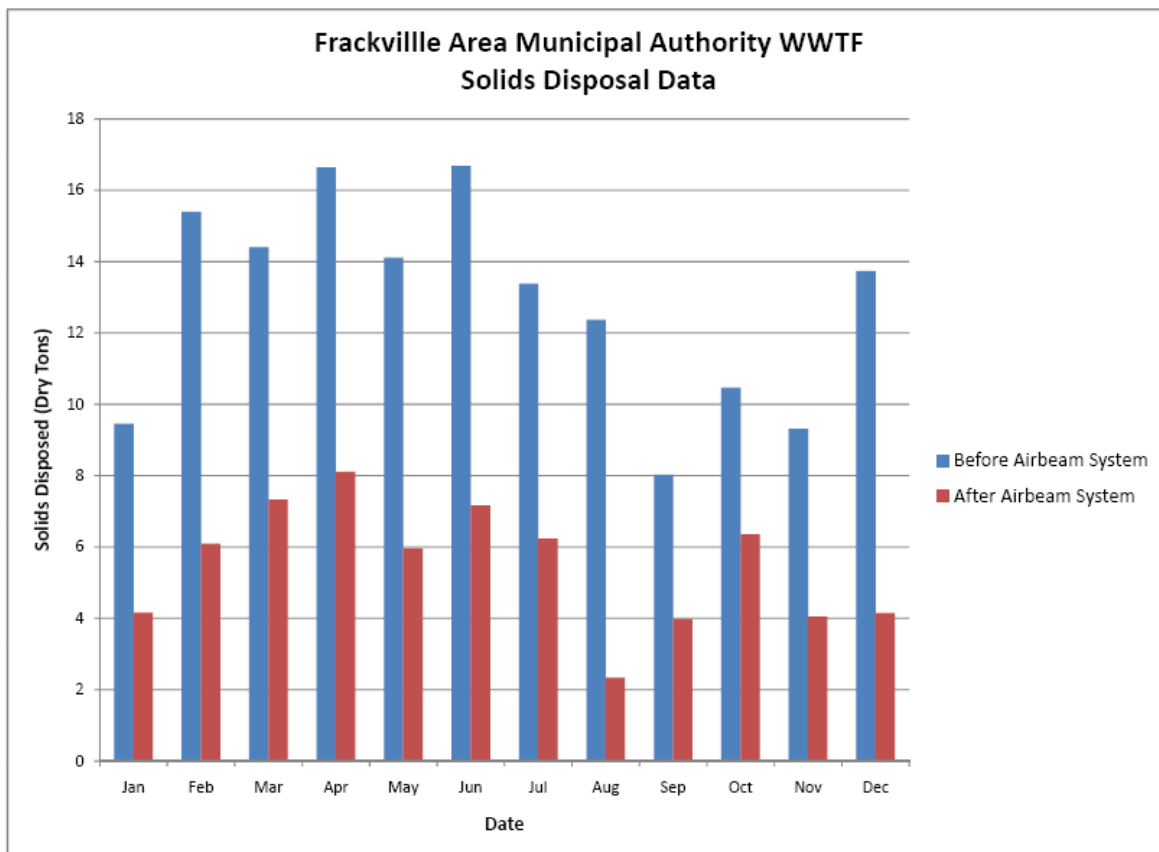
Figure 2: FAMA WWTF Energy Consumption Data



Reduced Sludge Disposal

Enhanced temperature control provided by the Airbeam® Cover aerobic digestion system greatly improves digestion performance as shown by the reduction in the amount sludge to be dewatered and disposed described in Figure 3 below. Prior to incorporation of the Airbeam® Cover aerobic digestion system FAMA disposed 1,036 wet tons of solids in 2009 costing \$26,000. After incorporation of the Airbeam® Cover aerobic digestion system FAMA disposed of 444 wet tons of solids in 2011 costing \$11,000. By substantially improving digestion of sludge, the Airbeam® Cover aerobic digestion system results in nearly two and a half times reduction in sludge disposal generating savings of \$15,000 annually in disposal costs.

Figure 3: FAMA WWTF Solids Disposal Data



Conclusions

The Airbeam® Cover aerobic digestion system at the FAMA WWTF has improved digestion performance and substantially reduced energy usage. FAMA is able to save a total of \$33,000 annually through reduced energy and disposal costs from the Airbeam® Cover aerobic digestion system. This results in a payback of less than 10 years.