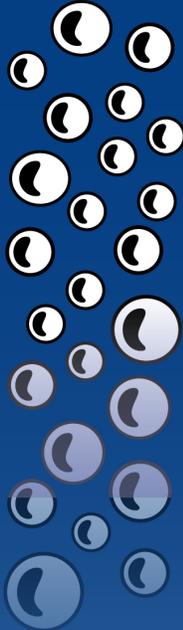




**G E M**  
Gas Energy Mixing By CWT



## CASE STUDY

## PORK SLAUGHTERHOUSE

### INTRODUCTION

Prior to the installation of two 1,200 gpm GEM (Gas Energy Mixing) Systems, CWT's Client discharged approximately 1.9 million gallons per day (mgd) to their onsite pretreatment plant consisting of an Infilco Dissolved Air Flotation (DAF) unit service with a Nikuni pump, and a Maxair Clarifier (DAF) for further removal of contaminants. Float from both units was heated and sent to a centrifuge where oils, solids, and water were separated. Solids were sent back to rendering and the oils were collected for sale. After the DAF's, the effluent was gravity discharged to a lift station where it was pumped to an anaerobic digester and ultimately discharged to the local municipal treatment facility for further treatment.

### CHALLENGE

To send compliant wastewater to the City, CWT's Client needed higher solids removal and more capacity than their existing DAF's (each approximately 20 years old) could handle. Replacement of existing DAF's with new DAF's would have required more square footage and would have necessitated expansion of the current building or the addition of a new building. During their research, the Client was introduced to CWT's GEM System. They learned that the GEM System could provide higher contaminant removal with more efficient chemical usage and a significantly smaller footprint. Since the GEM System mixes air into 100% of the waste stream and the LSGM (liquid solid gas mixer) heads are responsible for mixing the chemicals and separating the liquids from the solids, the GEM System can handle higher flow rates with a much smaller footprint than conventional DAF technology. By replacing their two DAF Systems with two 1,200 gpm GEM Systems, they were able to fit the GEM Systems into the existing building with the added benefit of freeing up nearly 1,200 sf of their existing building that formerly housed only one of the outdated DAF's.

**TABLE 1: GEM REDUCTIONS BEFORE CLIENTS LAGOON**

PARAMETER	INFLUENT	EFFLUENT	PERCENT REDUCTION	FERRIC/CAT/ANI
TSS	3,000	25	99%	160/20/10
COD	7,000	800	89%	
Turbidity	1,850	7	99%	

### SOLUTION

Wastewater samples pre- and post-DAF treatment were forwarded to CWT's in-house laboratory for testing. The results showed that the GEM System would effectively treat the waste stream using GRAS polymers to provide Client with higher contaminant reductions of 99%, 89% and 99% TSS, COD and Turbidity respectively. After performing an onsite demonstration and comparing chemical usage to that of their existing DAF tanks, Client staged the installation of the GEM Systems so as to demolish their existing DAF's while continuing to run during the full installation and implementation of the GEM units.

## CHEMICAL USAGE

During the onsite demonstration of the GEM System, Client compared chemical usage to that of their existing DAF units. The following table demonstrates the comparative analyses that were derived on the pilot test:

UNIT TYPE	CHEMICAL DOSE	EFFLUENT TSS	% REDUCTION
GEM System	16 ppm Cationic	291 ppm Average	99% Average
Conventional DAF	20 ppm Cationic	650 ppm Average	74% Average

## SURCHARGES

Client is currently achieving significantly higher contaminant reductions while removing sludge that would have previously been sent to the lagoon requiring expensive dredging on a regular basis. The City is also consistently happier with the discharger since they are now providing more consistent, cleaner water.

## OIL RECOVERY

Client is recovering more oil with the centrifuges after the GEM System which is providing them with valuable product for resale.

## EASE OF OPERATION

The Client is now able to be more focused on meat processing rather than spending valuable time, effort and finances on treating their wastewater.

