



G E M
Gas Energy Mixing By CWT

CASE STUDY

MILITARY AIR BASE

INTRODUCTION

In 2009, a West Coast Military Air Base contacted CWT to bid on a plane washing wastewater treatment facility. The military needed to upgrade and replace their antiquated dissolved air flotation (DAF) unit to meet more stringent discharge requirements and attain higher contaminant reductions. Being a Federal Base, it was imperative for the military to have the best wastewater treatment technology to consistently meet EPA requirements. Furthermore, the system needed to be easy to operate and able to accommodate future growth.

CHALLENGES

With local and federal agencies enforcing strict regulations to produce cleaner effluent, the Federal Base conducted an "Industrial Wastewater Treatment Plant Tank Systems' Integrity Assessment" to assess the condition and functionality of their existing DAF's. The report identified that contaminant discharge levels were too high, and that much of the tank and equipment was beyond repair and needed to be replaced.

	Historical Influent	Designed Criteria Requirement
pH (units)	8.14	6.0 – 9.0
TSS (mg/L)	350	60 Daily / 30 Monthly Avg.
Settleable Solids (mg/L)	160	0.5 Max
FOG (mg/L)	1,000	100 Max

SOLUTION

Once CWT was provided access to analyze the stream and understand the existing process, it was decided that the GEM System was the best available technology to separate the oils, surfactants and metals as a result of cleaning and maintenance of aircrafts. CWT provided a turn-key installation that included the Screening System, Chemical Injection and Chemical Mixing Systems, D – Loop, pH System, a **GEM System 20/75 unit**, a Sludge Tank, an Outfall/Discharge System, a Self-Cleaning Disc Filter and equalization (EQ) Tank.



GEM SYSTEM PERFORMANCE

CWT provided a GEM 20/75 wastewater treatment System that not only addressed the Client's concerns but guaranteed that the base would comply with the new EPA limits. These limits required that total suspended solids (TSS) be no more than 30/mg/L on a monthly average; settleable solids (SS) be no more than 0.05 mg/L maximum, fats oils and grease (FOG) be no more than 100mg/L maximum. The EPA required that the Air base decrease existing TSS by 90%, Settleable Solids by 97%, and FOG by 90%. CWT's turnkey solution significantly reduced footprint, contaminant reductions, sludge production and consistently leaves the air base in compliance.



(Left: Before Treatment Right: After GEM)

The average results for the military base indicated that treatment via the GEM System provided the reductions below:

	BEFORE GEM TREATMENT	AFTER GEM TREATMENT	% REDUCTION
TSS/ppm	260	20	95%
COD/ppm	5,500	845	84%
Turbidity/ppm	650	13	96%
FOG	410	20	95%

CONCLUSION

CWT's solution and GEM System operating principles provided to the Air Base, the ability to adapt to both contaminant loading and hydraulic loading. Should the military's wastewater flow increase or decrease from its average of 60 gpm, the GEM System provided will be able to accommodate flows below 60 gpm and up to 75 gpm. In addition, since the GEM System has very few limitations on contaminant loading (ie: the same size system can be used for 10 ppm or 30,000 ppm of TSS), the GEM 20/75 will meet their needs now and far into the future with no capital expenditures. In addition to its performance and flexibility, the compact footprint of the GEM System provides the military with the confidence to replace the two existing DAF units and install the entire system in a small self contained pad. The military can now easily operate and maintain their wastewater treatment plant according to EPA standards now and in the future.

Sustainability: As water conservation procedures are implemented and the levels of contaminants increase, the GEM System will continue to produce exceptional results. The performance of the GEM System will not be affected by the increased level of contaminants in the stream and no additional capital will be required to handle the higher loadings. In addition to the reduced footprint and flexibility of the GEM System, other savings provided by using the GEM System include reduced chemical usage, reduced energy consumption, and drier sludge when compared to conventional dissolved air flotation (DAF) technology.