

INTRODUCTION

Clean Water Technology, Inc. (CWT) is a global water and wastewater treatment firm serving Clients worldwide. The Colombian based SAIDA S.A. (Soluciones Ambientales Integrales de La Amazonia "SAIDA"), provides wastewater treatment for several oil well processors in the area. With increased production from several of their Clients, SAIDA needed to expand their Waste Water Treatment Plant (WWTP) to handle increased capacity quickly. SAIDA relied on CWT for assistance.

CHALLENGE

SAIDA's existing WWTP included Clarification (3 Sedimentation Basins); Skimming; Coagulation Tanks; Multi-Stage Flocculation; and Final Filtration. Due to CWT's reputation as a service-oriented technology provider with the most advanced flotation and flocculation technology - the GEM (Gas Energy Mixing) System - CWT was chosen specifically to partner in this project.

**SOLUTION**

For this application, CWT suggested the installation of a GEM System 150/350 to increase capacity to over 500,000 gallons per day (gpd) and to provide significant removal rates of TSS (total suspended solids), FOG (fats, oil and grease) TPH (Total Petroleum Hydrocarbons) and undissolved BOD (biological oxygen demand).



The GEM System was installed after Sedimentation Basins. To save chemical costs and achieve maximum removal rates, pH was adjusted to approximately 7.5 in a modified Equalization (EQ) Tank by adding nitric acid at 2%.



By utilizing cationic and anionic polymers (a dual flocculant approach), the GEM System 150/350, the GEM influent was easily treated and disposed of on an infiltration field at a rate of 5 lps (liters per second).



PERFORMANCE PARAMETERS

As the most efficient primary treatment system in removing emulsified oils, the GEM System 150/350 removed 99% of FOG (from 710 mg/l to <7.4 mg/l), 99% of Turbidity (NTU) (from 404 to 3.37) and 99% of Total Petroleum Hydrocarbons (TPH) (from 250 mg/l to 3.2 mg/l).

PARAMETER	INFLUENT	EFFLUENT	% REDUCTION
FOG (mg/l)	710	< 7.4	99
Total Petroleum Hydrocarbons (mg/l)	250	3.2	99
Turbidity at 19°C, NTU	404	3.37	99
BOD₅ (mg O₂/l)	1120	224	80
COD (mg O₂/l)	2217	516	77
Total Iron (mg Fe/l)	0.260	0.130	50
Sodium (mg Na/l)	591	394	33
Carbonates (mg CO₃⁻²/l)	352	71.6	80
Alkalinity at pH 4.5 (mg CaCO₃/l)	752	612	19

The GEM System provided SAIDA with the best available treatment, lowest operational cost, easy operation and reliability – all within the smallest available footprint.

ADVANTAGES

CWT's GEM System prevailed where other technologies would have struggled. Today, SAIDA's state of the art wastewater treatment plant utilizing CWT's GEM System realizes the following benefits:

- Discharge limits are successfully achieved.
- Reduced operational costs are the result of efficient chemical use and high contaminant reductions.
- Flexible flows and loadings offered by the GEM System provide the benefit of expandability for future growth.
- Production of highly concentrated DRY sludge is easy to transport and has a high value for byproduct reuse.

