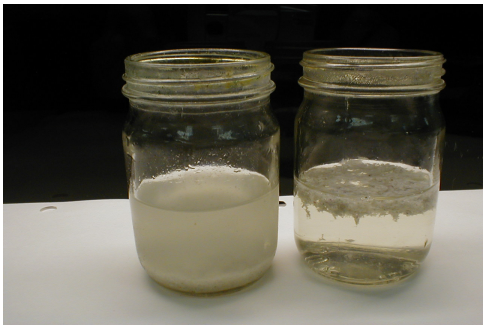
CASE STUDY

PAPER MILL RETROFIT

INTRODUCTION

Clean Water Technology, Inc., the creator of the Gas Energy Mixing (GEM) System, the most advanced primary treatment system on the market. The GEM System provides superior reduction of total suspended solids (TSS), biological and chemical oxygen demand (BOD/COD), fats, oils and grease (FOG) and turbidity.



CHALLENGE

A prominent paper mill company in Colombia was faced with their operation out growing their current dissolved air flotation (DAF) unit – in terms of loadings and flows. With pressure from local authorities they needed to produce cost savings by reducing wastewater surcharges.

This paper mill manufactures recycled and cardboard paper. This wide array of products produced a stream which required a system adaptable to wildly changing streams due to their contaminant loading, composition, pH and chemical demand. It needed to be easy to operate, efficient and produce the driest and least amount of sludge by volume. They were in need of a solution.

This led them to Clean Water Technology (CWT) and the GEM System. After the client compared the cost and footprint challenges of upgrading their DAF to the cost of retrofitting their existing DAF using GEM technology, the savings were significantly outstanding.

COOPERATION

Upon receiving samples from the client at CWT's laboratory in Los Angeles, CA, CWT performed a treatability study. CWT's testing results demonstrated that the GEM System retrofit would meet and exceed all of their treatment needs.

TABLE 1: GEM Effectiveness on Influent from Paper Mill, Colombia

PARAMETER	INFLUENT	EFFLUENT	PERCENT REDUCTION
TSS	2,750 ppm	25 ppm	99%
COD	4,800 ppm	800 ppm	83%
Turbidity	950 NTU	8 NTU	99%

The removal rates of the GEM System on the client's waste streams all had one common theme: 100% Success.

SOLUTION

The facility decided to contract with CWT immediately for its DAF retrofit with the GEM technology. Retrofitting their existing DAF they were able to handle double the capacity in terms of loadings, flow and still perform in accordance with the regulation, while having the flexibility for future expansion with no capital expenditures.

The retrofit called for removal of the existing floc tubes, insertion of a bloom chamber (simply a partition in the DAF that allowed the flocs to "POP" to the top once the solids and liquids were separated) and the retrofit to the GEM Technology by adding one banks of Liquid Solid Gas Mixers (LSGM).

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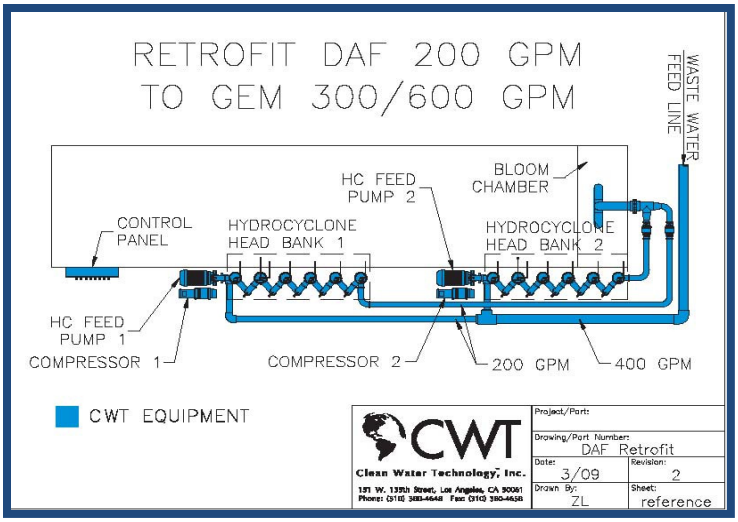
Using the existing flotation tank, throughput was calibrated upon the Client's needs. From the GEM conversion, the treated effluent is recycled into the plant – then it arrives again to the wastewater treatment plant. About 70% of the stream is reused and 30% is discharged to the river in accordance with local codes.



EXPANDIBILITY

The existing GEM retrofit, as is, is expandable simply by opening up more holes in the LSGM heads. This can be done by Client's operators on site with less than forty minutes of down time

The GEM technology prevailed over the many challenges presented where other technologies would have struggled. By retrofitting with the GEM technology, the Client benefitted from:

- Lower Surcharges, Eliminating Fines
- Easy Operation
- Increased Contaminant Loading Capability
- Increased Contaminant Removal Rates
- Improved Site Logistics
- Reduced Sludge Hauling Costs due to Drier, Denser Sludge
- Decreased Use of Chemicals

ECONOMICS

In addition to meeting the regulatory requirements and reducing the surcharges and fines, the DAF to GEM Retrofit now performs more efficiently, achieves higher contaminant removal rates by removing TSS to trace amounts and reducing COD by half. Due to the absence of contaminants after the GEM Retrofit, some of the flow is being reused in the plant.

EXPERIENCE

CWT's successful implementation of the wastewater treatment solution for the client not only comes with the innovative design of the GEM System, Shown below are results from some of the paper mill processors with whom CWT has worked in the past:

TABLE 2: GEM Effectiveness on Influent from Paper Mill, Mexico			
PARAMETER	**INFLUENT**	**EFFLUENT**	**PERCENT REDUCTION**
TSS	2,500 ppm	25 ppm	99%
COD	4,000 ppm	1,300 ppm	68%
Turbidity	1,000 NTU	8 NTU	99%
TABLE 4: GEM Effectiveness on Influent from Paper Mill, Maine			
PARAMETER	**INFLUENT**	**EFFLUENT**	**PERCENT REDUCTION**
TSS	1,490 ppm	25 ppm	97%
COD	1,900 ppm	280 ppm	76%
Turbidity	Over 1,000 NTU	7 NTU	99%