



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

## CASE STUDY

### Chocolate, Candy and Snack Cake Manufacturer

A world renowned sweets manufacturer located just outside the heart of a major city in Mexico, produces sweet marshmallow chocolate-covered products. Faced with space limitations and increased discharge regulations, this processor needed to find a primary wastewater treatment system that would solve their regulatory issues, be expandable for the ever-growing company and fit within a small footprint.

#### CHALLENGE

Federal regulations in Mexico require industrial facilities that generate and discharge wastewater into municipal systems, to register with the state environmental or municipal wastewater agency and obtain an industrial discharge registration. The federal standard regulating industrial wastewater discharge is known as NOM-002<sup>1</sup>.

The average flow is 45,700 gallons per day (gpd). The NOM-002 discharge requirements for the site are as follows:

- BOD 30 ppm
- TSS 30 ppm
- FOG 30 ppm

Space limitations were a major consideration as the processor had only 1,076 sf (square feet) available for their treatment facility. Prior to the GEM System design, CWT analyzed 8 samples at their laboratory in Los Angeles, CA.

**TABLE 1: Sample from Chocolate Drop (Beginning of shift)**

PARAMETER	INFLUENT	EFFLUENT	PERCENT REDUCTION
TSS	450 ppm	45 ppm	90%
COD	5,000 ppm	3,900 ppm	22%
Turbidity	<1,000 NTU	52 NTU	99%

Chemical Treatment at pH 5.7: 10 ppm of C-498 10 ppm of A-130

**TABLE 2: Sample from Chocolate Drop (End of shift)**

PARAMETER	INFLUENT	EFFLUENT	PERCENT REDUCTION
TSS	210 ppm	20 ppm	90%
COD	2,500 ppm	1,800 ppm	28%
Turbidity	<1,000 NTU	6 NTU	99%

Chemical Treatment at pH 5.7: 15 ppm of C-498 10 ppm of A-130

**TABLE 3: Sample from Granillo (Beginning of shift)**

PARAMETER	INFLUENT	EFFLUENT	PERCENT REDUCTION
TSS	520 ppm	18 ppm	97%
COD	8,800 ppm	7,000 ppm	20%
Turbidity	<1,000 NTU	7 NTU	99%

Chemical Treatment at pH 6.3: 80 ppm of C-498 10 ppm of A-130

**TABLE 4: Sample of Granillo (End of Shift)**

PARAMETER	INFLUENT	EFFLUENT	PERCENT REDUCTION
TSS	920 ppm	22 ppm	97%
COD	24,000 ppm	20,000 ppm	17%
Turbidity	<1,000 NTU	5 NTU	99%

Chemical Treatment at pH 5.67: 30 ppm of C-498; 10 ppm of A-130

**TABLE 5: Sample of Sugar Mill (Beginning of Shift)**

PARAMETER	INFLUENT	EFFLUENT	PERCENT REDUCTION
TSS	900 ppm	25 ppm	99%
COD	26,000 ppm	22,000 ppm	15%
Turbidity	<1,000 NTU	5 NTU	99%
Chemical Treatment at pH 5.7: 70 ppm of C-498; 10 ppm of A-130			

**TABLE 6: Sample of Sugar Mill (End of Shift)**

PARAMETER	INFLUENT	EFFLUENT	PERCENT REDUCTION
TSS	550 ppm	20 ppm	95%
COD	10,000 ppm	22,000 ppm	20%
Turbidity	<1,000 NTU	6 NTU	98%
Chemical Treatment at pH 5.7: 30 ppm of C-498; 10 ppm of A-130			

**TABLE 7: Chocolate Drops Concentrated**

PARAMETER	INFLUENT	EFFLUENT	PERCENT REDUCTION
TSS	15,000 ppm	20 ppm	99%
COD	45,000 ppm	22,000 ppm	51%
Turbidity	<1,000 NTU	6 NTU	99%
Chemical Treatment at pH 5.67: 300 ppm of C-498; 10 ppm of A-130			

**TABLE 8: Grease Trap Concentrated**

PARAMETER	INFLUENT	EFFLUENT	PERCENT REDUCTION
TSS	22,000 ppm	24 ppm	99.9%
COD	90,000 ppm	44,000 ppm	51%
Turbidity	<1,000 NTU	4 NTU	99%
Chemical Treatment at pH 5.67: 700 ppm of C-498; 10 ppm of A-130			

## SOLUTION

The above sampling proved useful in designing the optimal treatment strategy. It was essential that the primary treatment process removed all levels of solids, TSS & FOG; as well as drastically reduce the BOD/COD values. For further reduction of BOD/COD, a secondary treatment system was deemed necessary.

Based upon the above laboratory results, it was confirmed that CWT's Gas Energy Mixing (GEM) System would effectively remove the TSS and FOG, followed by an anaerobic reactor and a moving bed bioreactor (MBBR) for a BOD reduction to 50 ppm., the stringent level required by NOM-002. Prior to the GEM System, CWT installed a rotary drum screen (RDS) followed by an equalization (EQ) tank. After the MBBR, CWT installed a clarifier and dual media filters.

## ECONOMICS

In addition to meeting the discharge requirements, the Client benefitted from reduced energy, low chemical and sludge related costs all within a minimal footprint.

**The system was brought online in April 2007. The Client is meeting their discharge requirements while benefitting from reduced energy, chemical and sludge-related costs. The small footprint of the GEM System saved the company from erecting a building.**